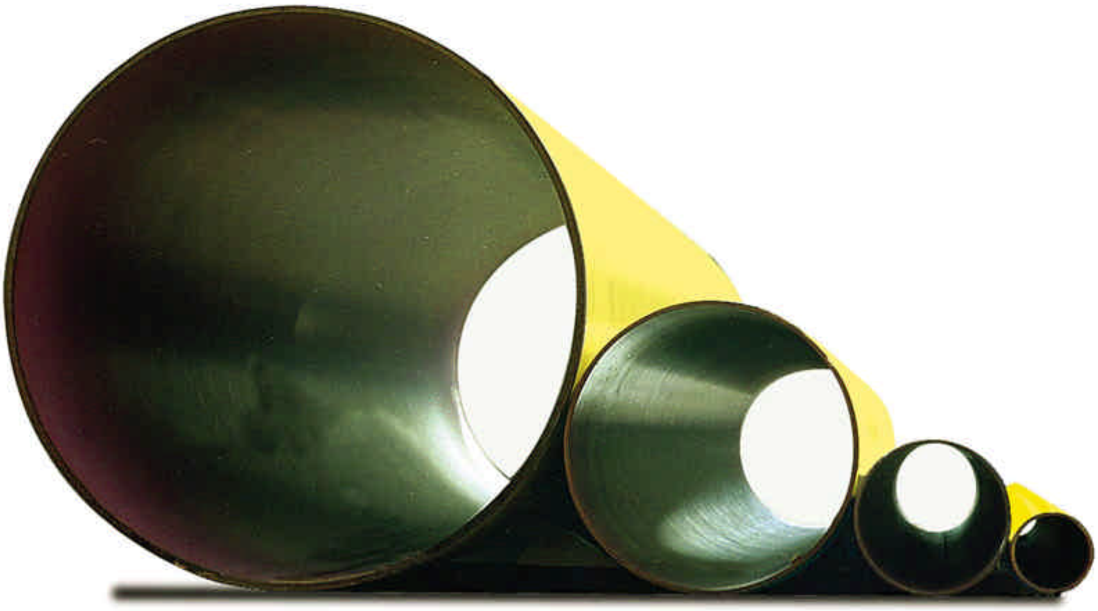


# Transportation Ten Year Statement 2003

**National Grid Transco**

## Disclaimer

This Statement is produced for the purpose of and in accordance with Transco's obligations in Standard Condition 25 of its Gas Transporters' Licence and Section O 4.1 of its Network Code in reliance on information supplied pursuant to Section O of its Network Code. Section O 1.3 of its Network Code applies to any estimate, forecast or other information contained in this Statement.

Transco's Ten Year Statement is not intended to have any legal force or to imply any legal obligations as regards capacity planning, future investment and the resulting capacity.

# Foreword

The 2003 edition of our Ten Year Statement is the second to be published by National Grid Transco and the eighth produced in accordance with Condition 25 of Transco's Gas Transporters' Licence. This requires that the Ten Year Statement, published annually, shall provide a ten-year forecast of transportation system usage and likely system developments that can be used by companies, who are contemplating connecting to our system or entering into transport arrangements, to identify and evaluate opportunities.

The Statement explains our latest volume forecasts, system reinforcement projects and investment plans. It has been published at the end of the 2003 planning process following a reappraisal of our analysis of the market and expands on the work published in Transco's "Transporting Britain's Energy – Development of NTS Investment Scenarios" document in June 2003. The Statement forms the basis of our industry wide consultation process, Transporting Britain's Energy, due to restart in the new year, and is the first element of our 2004 planning process.

## Layout

The Statement contains essential information on actual volumes, the process for planning the development of the system, including demand and supply forecasts, system reinforcement projects and associated investment. The main body of the document provides an overview of the key issues, with all the detail contained in the appendices.

I hope you find the 2003 Ten Year Statement both interesting and informative. However, with our goal of continually developing the document, we would welcome any comments on the style and content via the electronic feedback form, which is available on the website.

I look forward to receiving your views on the Statement, including suggestions as to how it might be further improved.

Nick Winser, Group Director, UK & US Transmission
National Grid Transco
December 2003

# Contents

# Chapter One

## Executive Summary

The purpose of this document is to set out our assessment of the future demand and supply position for natural gas in United Kingdom, and the consequences for investment in the gas transmission network.

### Context

As in previous years, we have developed the forecasts of demand and supply presented in this year's Ten Year Statement (TYS) using data received during the course of our Transporting Britain's Energy consultation process, supplemented by some commercially available information. Over time, we hope that the Long Term System Entry Capacity (LTSEC) auctions will supplement these traditional data sources and provide us with additional evidence of the need for investment in the National Transmission System (NTS). Two LTSEC auctions have been held in 2003. These have been successful in providing shippers with the opportunity to bid for capacity as far out as 2020. However, to date, they have not provided us with a sufficient signal to justify releasing capacity into the long-term over and above the levels that we are obliged to make available under our Gas Transporters' Licence.

### Demand & Supply Outlook

Our latest forecasts indicate an 18% increase in annual gas demand by 2012/13, with peak demand growing at a similar rate. Projected growth in the early years continues to be depressed as a result of the ongoing slow-down in the manufacturing sectors. In the medium term, exports to Continental Europe are expected to reduce as the Continental Interconnector operates progressively more in import mode. Recognising the inevitable level of uncertainty surrounding these forecasts, this TYS highlights the key sensitivities and analyses the potential impacts on our transmission network. Many of these sensitivities stem from developments arising from the Government's Energy White Paper, published in 2003, while others relate to the general economic outlook and price trends. Nonetheless, from an NTS perspective, the demand-side uncertainties are likely to be relatively minor when compared with developments on the supply-side.

To meet future levels of demand, and with gas production from the UK Continental Shelf (UKCS) starting a sharp decline, new sources of supply will be required. The annual supply position is now tightening year-on-year, with 2005/06 the first year in which there will be dependency on new importation infrastructure to meet severe winter demand.

Our latest analysis suggests that UK's import dependency will be around 50% by the end of the decade, and approximately 67% by 2012/13. Reflecting this, there are a number of significant importation projects under development at present, although considerable uncertainty remains over which will proceed, to what scale and the associated timings.

## NTS Investment Implications

To capture the ongoing supply-side uncertainties, this year we have again adopted two scenarios with which to assess the range of impacts on the NTS of potential new supplies. The first gives weight to greater interconnectivity with Europe as the principal means of filling the projected supply gap. The second places more emphasis on LNG imports. In reality, both scenarios assume a mix of each import type, with the differences relating to timing and scale.

Depending on the supply scenario, our network analysis indicates that NTS investment in the order of £1.0bn-£1.2bn will be required over the life of the long-term plan.

In addition to the uncertainty regarding the location of new supplies, physically undertaking investment on the NTS is becoming increasingly challenging as a result of changes to environmental legislation and increased landowner resistance. With the UK's growing dependence on imports and the progressive tightening of supply, the planning of the transmission infrastructure is moving into an inherently more uncertain era in which lead times are likely to become an ever more critical factor.

## Next Steps

The production of this TYS is the final milestone in the 2003 planning cycle. However, consistent with the approach adopted in previous years, we propose to use the forecasts contained in this TYS as the starting point for next year's consultation. In addition, targeted questionnaires will be circulated to a range of industry players requesting demand and supply forecast data shortly after publication of this document.

# Chapter Two

## Document Scope

### 2.1 Overview of "Transporting Britain's Energy" Process

The production of the TYS is essentially the conclusion to the planning process for the current planning cycle. As in previous years there are areas of remaining uncertainty, which we will address through the impending Transporting Britain's Energy (TBE) consultation that will initiate the start of the planning process for 2004. We propose to use the forecasts contained in this 2003 TYS as the starting point for this consultation. Shortly after the publication of this document, targeted questionnaires will be circulated to a range of industry players (producers, shippers, storage operators, terminal operators, transporters and consumers) requesting demand and supply forecast data and inviting views on our underlying assumptions.

The proposed programme for next year's plan is as follows:

- Publish 2003 Ten Year Statement – December 2003
- Circulate 2004 questionnaires – December 2003
- Receive responses to questionnaires – February 2004
- Hold consultation meetings – February 2004
- Provide feedback on responses received via the Internet – ongoing from early March 2004
- Produce outline investment proposals and publish industry consultation on investment options at a industry seminar – June 2004
- Publish 2004 Ten Year Statement (including an assessment of the 2004 LTSEC auctions) – December 2004

### 2.2 Structure of Document

The Statement has been structured so that the main body of the document, chapters 3 to 6, set out the key drivers and uncertainties affecting demand, supply and the provision of capacity on our system. Chapters 3 and 4, respectively, provide an overview of our latest demand and supply forecasts, highlighting the expected growth in the import dependency of the UK. Chapter 5 outlines our plans for investment in the NTS under the two supply scenarios discussed in Chapter 4. Currently approved NTS projects and those under consideration for construction are also presented here. Chapter 6 presents the Local Transmission System (LTS) and distribution approved projects along with the total market connection forecasts for the next 5 years. Chapter 7 then covers the latest commercial developments and incentives affecting our distribution and transmission systems.

The Appendices provide details of the methodologies used to produce the demand and supply forecasts, the latest demand and supply scenarios themselves, actual gas flow data, system maps, connection specifications (including gas quality) and commercial incentives. The final sections of the document contain a glossary and conversion matrix.

In an attempt to encourage more feedback this year's feedback form is electronic based and is accessed via the website.

To enhance the usefulness of the 2003 TYS we have incorporated all the demand and supply data shown in the document within the Excel file on our website.

# Chapter Three

## Demand

### 3.1 Overview

This chapter describes the main drivers behind the growth in the demand for gas over the last twenty five years before examining the key drivers that underpin our latest demand forecasts. An overview of these forecasts is provided in section 3.3 and an explanation of the main sensitivities of the forecast volumes is in section 3.5. The forecasts are broken down into greater detail in Appendix 2.

The last ten years have seen dramatic growth in the demand for gas within the UK, with growth rates reaching those not seen since the introduction of natural gas in the late 1960s. The main drivers behind this growth have been falling gas prices (brought about by a supply surplus in the mid 1990s and increased gas on gas competition), and the development of gas fired power generation. However, growth rates into the future are unlikely to continue at this level as markets near saturation and gas prices increase with greater linkage to European prices and a projected tightening of the supply-demand position. This view is supported by recent evidence, which shows that increases in industrial gas prices can lead to reduced gas demand within traditional industrial markets, particularly the interruptible sector.

### 3.2 Recent Energy Trends

This section endeavours to put into historical context the position of gas within the energy market and to identify the main market drivers supporting recent growth in gas demand.

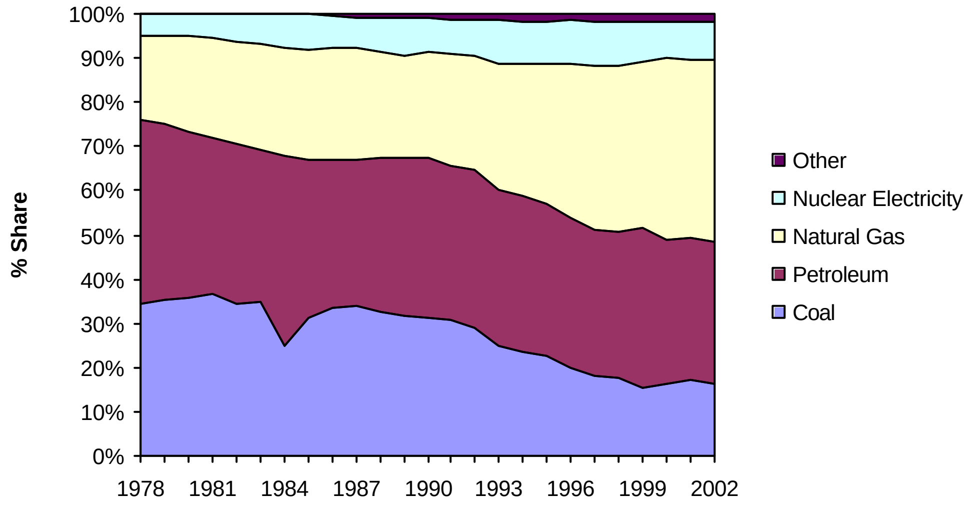
#### 3.2.1 Energy's Position in the Economy

In 2002 the energy industry accounted for around 4¼% of the UK's GDP. This share represents a fall of around 50% from the levels experienced a decade earlier and this change may be attributed to greater productivity, a shift in the balance of the economy toward less energy-intensive service sector activities and increased fuel efficiency.

#### 3.2.2 Energy Market

The UK's primary energy consumption has remained fairly static over the past twenty-five years, growing at a rate of ½% per annum. However, as Figure 3.2A illustrates, there have been significant developments during this period brought about by changes in the fuel mix and the nature of demand, such as the development of gas-fired power generation capacity and the resultant displacement of existing coal and oil-fired plants. Gas' share of UK primary energy consumption (before conversion and distribution losses) has more than doubled over the same period, increasing from 19% in 1978 to just over 40% at present. If transportation related usage is excluded from primary energy consumption, the current gas share increases to 54%.

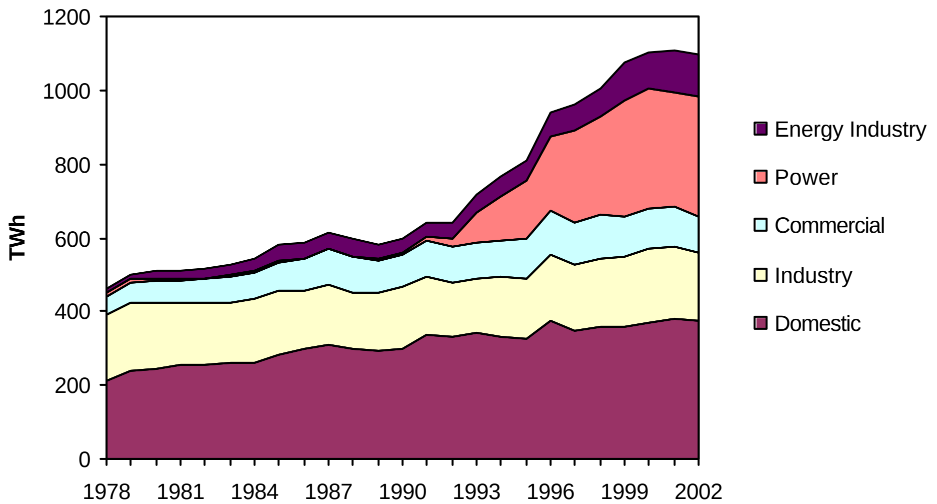
FIGURE 3.2A – Inland Consumption of Primary Fuels
Source – DTI, Digest of UK Energy Statistics (DUKES) 2003




## 3.2.3 Historical Gas Demand Growth

An examination of the development of each of the main market sectors allows a clear picture of the development of gas demand to be formed and places the gas share of primary energy consumption into context Figure 3.2B illustrates how each of the main sectors of gas demand has developed over the last twenty-five years. This data represents actual flows with no correction for the impact of prevailing weather conditions.

FIGURE 3.2B – Gas Consumption by Sector
Source – DTI, Digest of UK Energy Statistics (DUKES) 2003



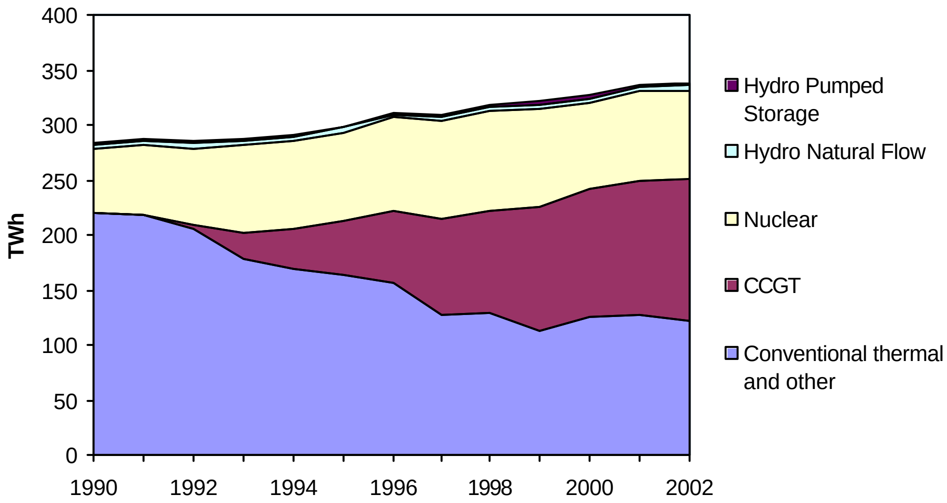

Demand in 2002 reduced by 1.3%, due largely to lower consumption in the industrial and commercial sector. In the case of the industrial market, which has experienced reductions in demand over the past two years, this loss of load can be attributed to the recent recession in manufacturing and higher gas prices.

### 3.2.3.1 Power Generation

The power generation sector has experienced very high rates of growth, with gas' share of generation growing to 38% of total UK power generated in 2002, now representing the predominant fuel type. The number of large power stations connected to the NTS has grown from 1 in 1991 to 33 in 2002. Due to higher gas prices, relatively cheap imported coal and the addition of very little new-build capacity, the gas share of this market has remained fairly static over the past four years. The contribution of nuclear plants has experienced no significant change over the period examined, typically accounting for around 25% of power produced, whilst conventional thermal capacity (largely coal & oil-fired plant) has reduced significantly. Figure 3.2C illustrates the generation mix of power stations operated by major electricity producers in the UK.

In addition to the growth in larger scale power generation, particularly Combined Cycle Gas Turbine (CCGT) stations, there has been strong growth in smaller scale embedded generation and Combined Heat & Power (CHP). However, the level of installed CHP capacity, as defined by the CHP Quality Assurance programme, has remained almost unchanged over the past three years.

FIGURE 3.2C – Electricity Generated by Major Power Producers in the UK
Source – DTI, Digest of UK Energy Statistics (DUKES) 2003

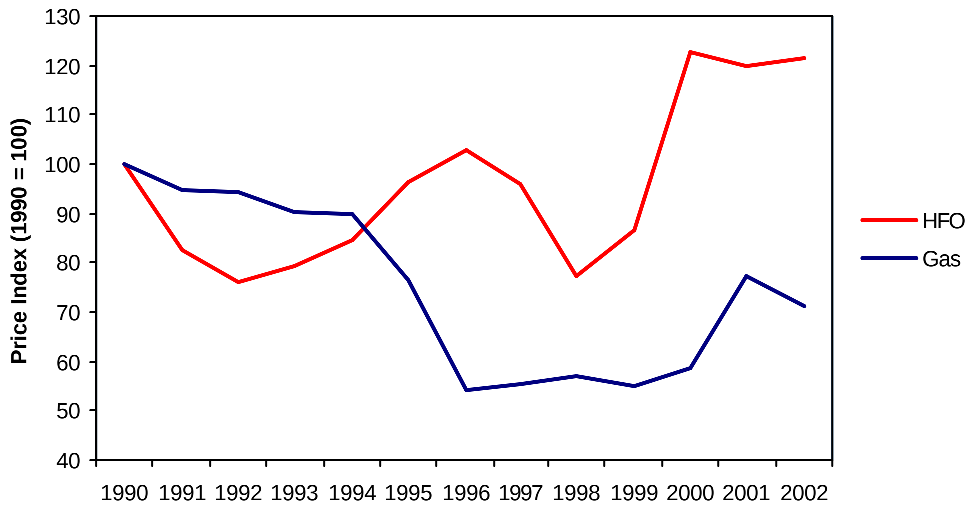



### 3.2.3.2 Industrial and Commercial

Historically, growth in the industrial and commercial sectors has been driven by the economic climate and fuel substitution brought about by the competitive position of gas in relation to other fuels, most notably oil. The level of fuel substitution was also influenced by various environmental initiatives. For instance, in the chemical industry, high sulphur content Heavy Fuel Oil (HFO) was in many cases replaced by gas. Coupled with this, demand was further enhanced through the implementation of various development schemes that sought to encourage new industry and investment into economically deprived areas.

Figure 3.2D provides a comparison of how the price of gas to industrial consumers over the last ten years has changed in relationship to changes in the price of oil.

FIGURE 3.2D – Industrial Price Indices
Source – DTI, Quarterly Energy Prices, September 2003



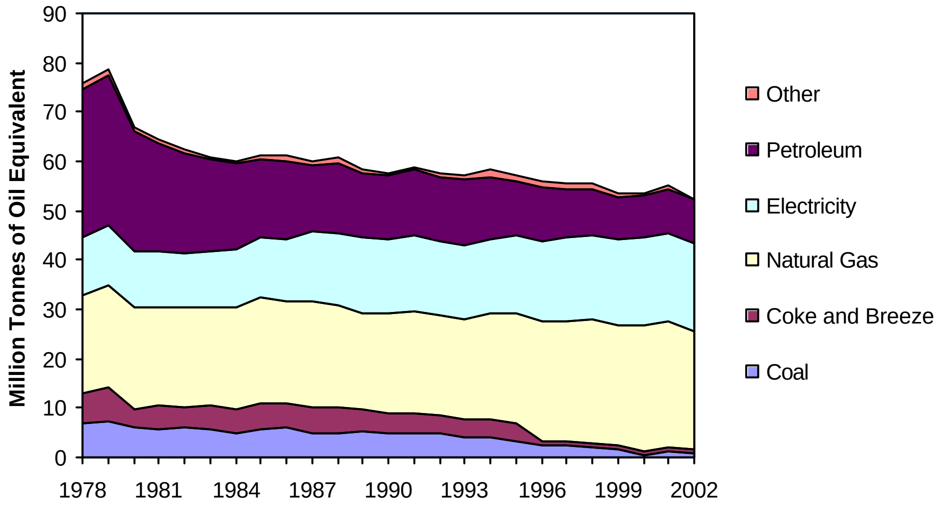

During the mid to late 1990s, a favourable economic climate and highly competitive gas prices, brought about by fierce gas on gas competition and rising oil prices, supported strong growth in the industrial and commercial sectors. However, since 1999, industrial gas prices have risen by around 30%.

Figure 3.2E illustrates, by fuel type, industrial energy consumption over the last twenty-five years. Gas' share of the industrial sector has grown from 27% in 1978 to around 45% at present, although this contribution has remained fairly stable over the past five years. Total demand in the industrial market has reduced by over 40% during the period.

In the commercial market, the gas share of consumption has doubled from 23% in 1978 to 46% in 2002 and, in a similar manner to the industrial sector, has remained fairly stable over the past five years. Electricity consumption in this sector has experienced very similar rates of growth over the period and the two fuels now account for 90% of total demand in the commercial market. The commercial market has grown by only 1% during the period.

In the industrial and commercial markets very little solid fuel is now used and the consumption of oil is only a fraction of what it once was.

FIGURE 3.2E – Industrial & Commercial Energy Consumption
Source – DTI, Digest of UK Energy Statistics (DUKES) 2003

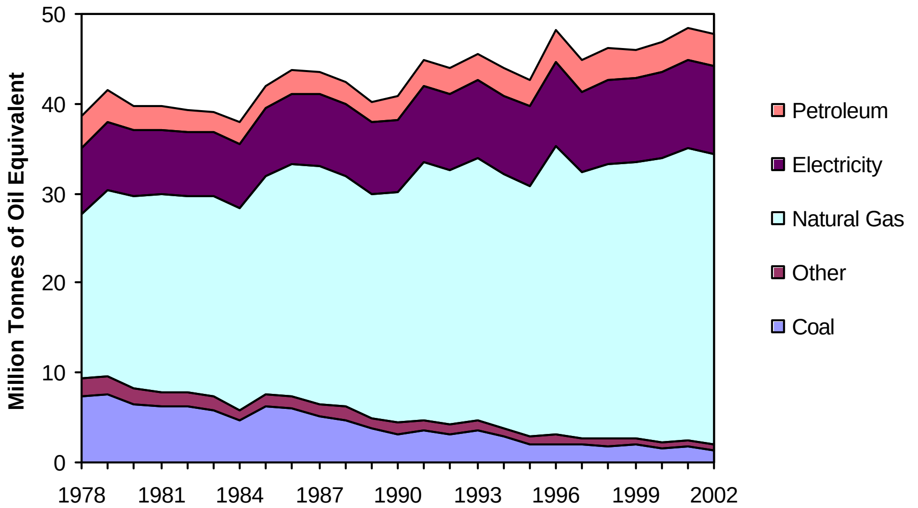



### 3.2.3.3 Domestic

The underlying growth rate of gas consumption in the domestic sector has fallen to less than 2% per annum in recent years due to the near saturation of the domestic energy market. Around 90% of all homes in Great Britain are centrally heated and gas-fired installations account for nearly 80% of these systems (having risen from a share of less than 60% in 1978).

Figure 3.2F illustrates the development of domestic energy consumption and the fuel mix over the last twenty-five years. Gas' share of this market has risen from 47% to 68% over the period, although this share has remained fairly static over past ten years.

FIGURE 3.2F – Domestic Energy Consumption
Source – DTI, Digest of UK Energy Statistics (DUKES) 2003



#### 3.2.3.4 Exports

The consumption data presented in Figures 3.2B, 3.2E and 3.2F excludes gas that has passed through our network prior to being exported to Ireland or mainland Europe. In the years following the commencement of flows (exports to Ireland commenced in 1995 and to Continental Europe in 1998) both the Irish and European markets experienced rapid growth. In the past three years total export demands have been around 150 to 160TWh per annum, the equivalent of approximately 14% of total system throughput.

## 3.3 Demand Forecasts – Planning Assumptions, Market Drivers and Forecasts

Our demand forecasts are based upon an extensive range of planning assumptions derived from our own market observations, the views of specialist consultancies and data collected from our consultation process, Transporting Britain's Energy (TBE). The consultation involves a broad cross-section of market participants, including consumers and consumer groups, and provides us with important feedback on the impact of market developments, such as the Climate Change Levy (CCL), and data relating to the consumption of new and existing loads. The management of requests for new connections to both our transmission and distribution systems provides another important source of data.

This section provides an outline of our latest gas demand forecasts and the key underlying assumptions. As in previous years, there remains significant uncertainty around the main drivers of demand growth and the impact that such drivers will have upon the development of the UK energy industry. However, for clarity, this chapter concentrates on our central planning case before considering realistic alternative scenarios based around analysis of demand sensitivities, the detail of which can be found in section 3.5.

### 3.3.1 Planning Assumptions

Our long-term gas demand forecasts are developed using a combination of techniques from econometric modelling to an assessment of individual load enquiries. Specific analysis of different sectors of the market, such as power generation, is also carried out.

The underlying basis for the forecasts is a set of planning assumptions, which if necessary can be flexed to create alternative scenarios. The following assumptions relate to the economy and fuel prices, whereas section 33.2 concentrates on market-based assumptions, e.g. relating to the environment, infrastructure and taxation policy. A number of these assumptions are drawn from data provided by independent consultancies. We validate these assumptions via the TBE consultation process, by way of targeted questionnaires and meetings with the main industry participants.

In overview, the main economic and price assumptions utilised in the production of this year's gas demand forecasts are:

- Economic growth averages around 2.6% per annum over the forecast period. However, this obscures the underlying disparity in the forecast between growth rates in the manufacturing and service sectors, with the latter growing at twice the rate of the former.

- Household expenditure initially slows from the high rates seen in the last few years, before picking up to give an average growth rate over the forecast period of 3.1% per annum
- Inflation, as measured by RPIX, is forecast to grow on average by 2% per annum well within the Government's target rate of 2.5%.
- New housing completions remain stable over the forecast period at around 180,000 per annum

Recent experiences have highlighted how sensitive industrial gas demand can be to periods of recession, emphasising the potential impact that any prolonged variation away from assumed economic growth rates could have on future demand. At an individual distribution network level, the degree to which demand would be influenced by such a change is largely dependent on the concentration and make up of local industry.

The following points summarise the assumptions that we have made in relation to key price-related influences on gas demand.

- The oil price initially falls before rising slowly in the mid to long-term. Over the period, the forecast assumes that oil, in real terms, remains around the mid point of OPEC's current preferred band of between $22 and $28/barrel. The price of oil-derived products, such as fuel oil, remains closely indexed to the price of crude.
- Gas prices remain fairly stable initially, before rising in real terms as a result of the tightening supply position and rising oil prices. Over the forecast period gas remains competitive against other fuels and consequently no significant fuel switching (away from gas) occurs.
- Prompt gas prices continue to be governed by prices at the beach although, due to the tightening supply situation, increased volatility may be expected around periods of high demand.
- Coal prices fall in real terms over the forecast period as demand falls.
- Wholesale baseload electricity prices rise initially, reflecting the forward price curve, then rise to reach the cost of new gas fired generation (£22½/MWh at current prices) by 2007/8.

The price of gas, and its relationship with the price of competing fuel sources, has a fundamental impact on demand. The tightening supply situation and the linkage that exists with continental gas markets has had a significant impact on British gas prices, with trading across the Continental Interconnector introducing an oil price influence to the market. Given the growing import dependency forecast over the medium to long term, the development of new supplies, in terms of both source and method of delivery, is perhaps the most notable gas price uncertainty, particularly at a time when the price of oil is subject to upward pressure.

Other significant price-related uncertainties relate to the wholesale electricity price and energy taxation, such as the Climate Change Levy (CCL) with its associated exemptions and climate change agreements.

### 3.3.2 Market Drivers

In relation to the demands placed upon our networks, the main market assumptions underpinning the latest projections of gas demand can be outlined as follows:

- The combined influence of weaker wholesale electricity prices, increased fuel costs and the operation of current trading arrangements result in the slippage of many CHP and small-scale embedded generation developments. The 2003 forecast assumes that installed CHP capacity will increase from the current level of around 4.8GWe to around 7GWe in 2010. Although lower than the Government's target, this projection is in line with recent independent forecasts. Gas-fired installations are expected to account for a large majority of new-build and represent approximately 80% of the total market by the end of the decade.
- The Climate Change Programme, including the impact of the CCL and energy efficiency measures offset non-domestic demand growth by 1½% by 2010.
- Trading of carbon-based emissions permits is expected to increase gas demand across the plan, reflecting initially the UK scheme and then the EU scheme from 2005.
- Socio-demographic changes influence growth in the number of households, with average household size falling over time. Across the domestic sector, average consumption remains stable with improvements in insulation and appliance efficiency offset by an increased comfort factor.
- Although the UK is expected to become a net importer of gas by 2005 there will still be significant quantities of gas exported due to the seasonal nature of gas demand.
- The development of the Corrib field off the west coast of Ireland is completed in time for first gas flow in 2008.

To illustrate the potential impact of these assumptions on demand the following sections consider their impact on three key sectors of demand.

#### 3.3.2.1 Combined Heat & Power

CHP has the potential to be one of the most significant drivers of demand growth within the distribution networks. In the case of 'good-quality' CHP installations, for which both input fuel and electricity exports are exempt from the CCL, there is a quantifiable incentive for new developments, although its effectiveness will depend upon a number of factors including the perceived risk of market participation. Relative fuel and power price movements have had an adverse effect on the economics of many potential projects and it is thought that would-be developers will require significant incentives (in addition to those already available) if the Government's 10GWe capacity target is to be achieved by 2010.

The development of new markets, for example domestic CHP, could lead to an upturn in the growth rate of installed CHP capacity and improve household related energy efficiency.

#### 3.3.2.2 Exports

The export market is made up of the demands of the Irish and Continental interconnectors. The Irish market is driven by factors not dissimilar to those affecting our own distribution networks, whilst the Continental Interconnector load is largely dependent on daily price differentials between the UK and Continental Europe.

It is expected that the flow of gas to Continental Europe will remain seasonal, with the UK becoming a net importer by 2005. For the purposes of this forecast, it is assumed that gas from the Shearwater Elgin Area Line at Bacton is not exported in significant quantities through the Continental Interconnector without entering the NTS i.e. limited by-pass occurs.

Demand for gas in Ireland is expected to grow strongly over the forecast period, particularly due to developments in the power generation sector, although the eventual development of the Corrib field will reduce the export demand placed upon our system in the mid to long-term. The forecast assumes no significant indigenous supply developments after Corrib.

Due to the influence that power generation has on the Irish market, any factors impacting upon existing demands, or the scale and timing of new gas-fired developments, will tend to have an effect on the accuracy of the forecast. Growth in the Irish economy, impressive in recent years, has of late experienced a slow down and the level at which rates stabilise in the future is a significant forecast sensitivity.

Uncertainty is also introduced into this element of the forecast by the potential for additional indigenous supplies. An example of this is provided by the recent upgrading of preliminary estimated reserves recoverable from the Seven Heads field, a fast-track development in the Celtic Sea that is expected to start commissioning flows towards the end of 2003.

### 3.3.2.3 Power Generation

Recent wholesale electricity prices have, in general, been too low to support the cost of new-build CCGT plants. The current forecast assumes that the development of most prospective new plants will require the wholesale baseload price to recover to a sustained level of around £22½/MWh. In May 2003, when our forecasts were prepared, our view was that this level would not be reached until 2007/8, although recent price movements would suggest this date will be brought forward. A limited number of loads with strong site-specific drivers are expected to progress in the interim period.

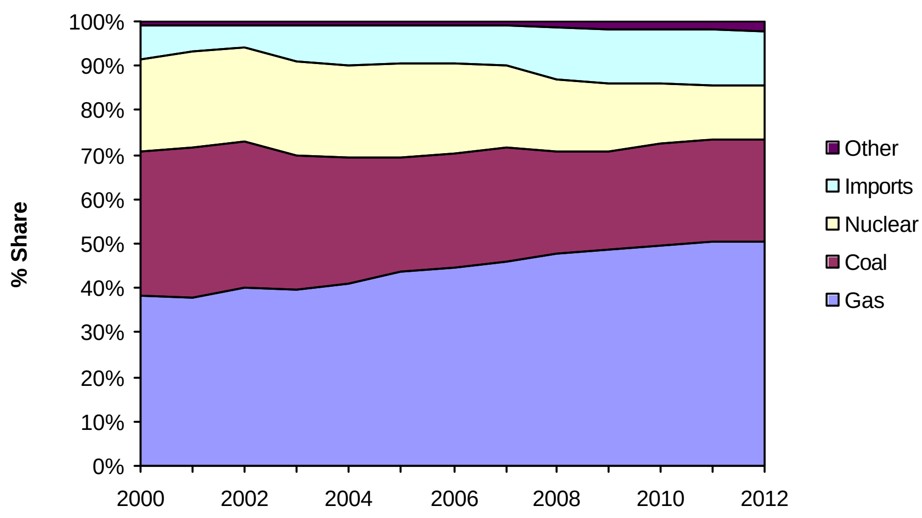
In the longer term, power generation demand will be supported by tighter environmental legislation e.g. the revised Large Combustion Plant Directive (LCPD), impacting upon conventional coal-fired plants, and the closure of all nuclear Magnox stations by 2010.

In addition, the development of onshore and offshore wind farms will contribute to growth in renewable generation. However, this in itself will require conventional generation capacity to provide back-up cover for periods when weather conditions prevent the full utilisation of renewable sources. Our forecasts assume that renewable generation will account for approximately 7% of electricity consumption by 2010. This projection is lower then the UK Government's target of 10%. One reason for this assumption is the uncertainty associated with the operation of the Renewables Obligation beyond 2010, although that has recently been clarified with the extension of the target out to 2015.

Over the last year we have seen the mothballing of a significant amount of generation capacity. However, forward electricity prices rose following the reduction in plant margin and higher European prices, which in turn have encouraged a number of stations to return to service from mothballs. Before these units returned the projected plant margin for the 2003/4 winter fell to around 15% and was forecast to rise only marginally over the plan period. However, the return to service of these units has had the effect of increasing the projected plant margin for 2003/4 to around 19%. This margin was reported in the October 2003 update of the Seven Year Statement.

Figure 3.3A shows that over the forecast period, the amount of electricity generated from gas by the major power producers in England and Wales is projected to increase from 40% to 51% of total power output.

FIGURE 3.3A – Historical & Forecast E & W Shares of Generation




## 3.3.3 Forecast Demands

This section presents an overview of our latest gas demand forecasts through to 2012/13 based on the consultation process and assumptions described above. Appendix 2 provides greater detail in relation to the forecasts including annual and peak day demand by LDZ and Distribution Network (DN).

DN demand is forecast to grow at an average of 1.5% per annum over the next 10 years. This is slightly below the level of growth that was forecast last year and results from the prospects of the manufacturing sector, higher forecast gas prices and some slippage in the development of CHP capacity.

The outlook for NTS demand is dominated by exports to Continental Europe and Ireland, and by developments in the power generation sector. We expect the level of exports to Europe to peak in 2003 and to reduce significantly from 2005 as the Continental Interconnector operates in import mode for longer. In relation to Ireland, slippage in the development of the Corrib gas field has increased the forecast level of exports in the medium term, prior to a reduction from 2008. CCGT demand, however, is forecast to grow throughout the period as gas generation progressively replaces coal and nuclear generation. Overall, NTS demand is forecast to grow at an average of 1.9% per annum to 2012.

Figure 3.3B shows how total annual gas demand has grown since 1990 together with predicted growth to 2012. The forecasts indicate an average growth rate in annual gas demand of 1.7 % per annum over the forecast period, well below the average of 5.7% per annum seen between 1990 and 2002, which was inflated by the impact of the "dash for gas" in the power sector and the growth in exports. The net effect of this forecast is to see gas' share of UK inland primary energy consumption increase to 46% in 2010, from the current level of just over 40%.

FIGURE 3.3B – Historical & Forecast Annual Gas Demand

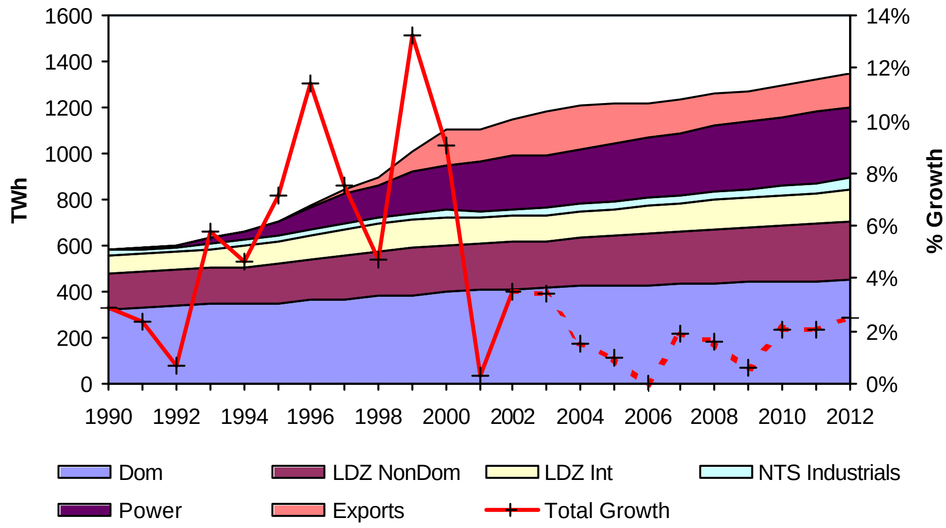
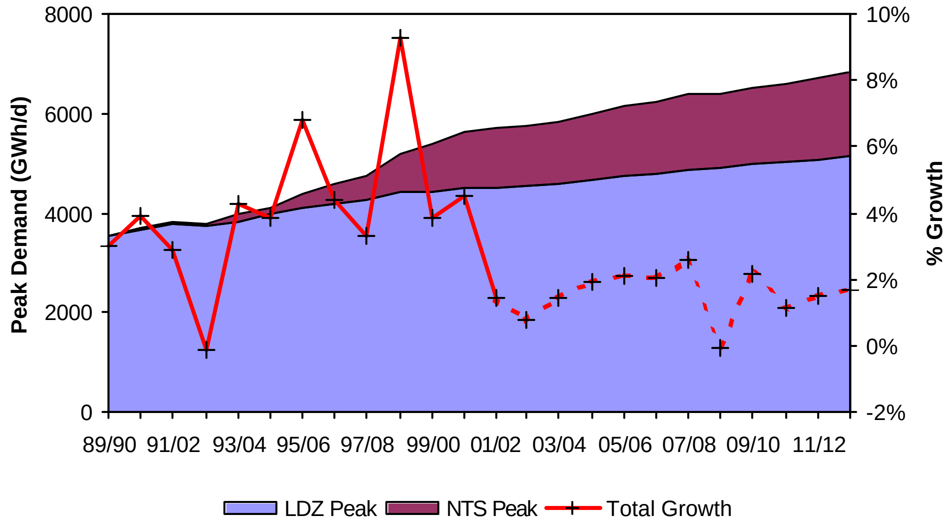



Figure 3.3C shows the equivalent view of peak demand, which is forecast to rise at a rate of 1.6% per annum over the same period, also lower than the long-term average.

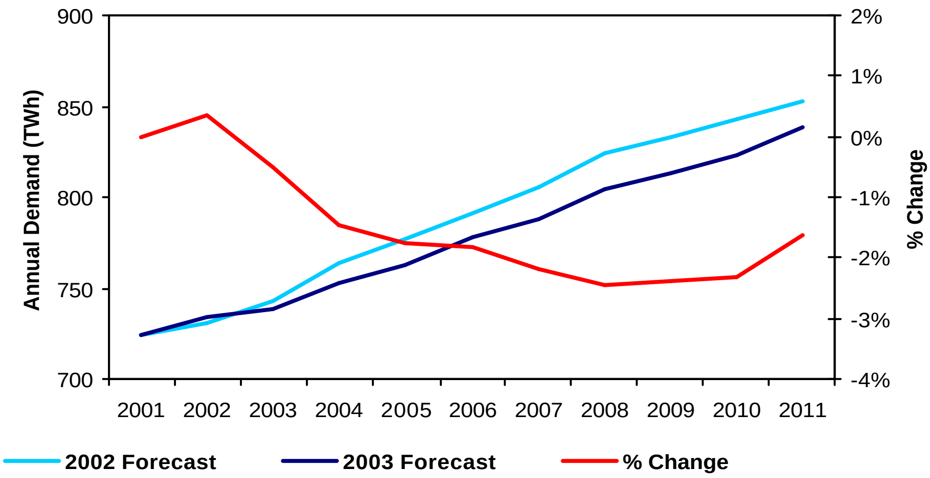
FIGURE 3.3C – Historical & Forecast Peak Gas Demand



## 3.4 Forecast Comparisons

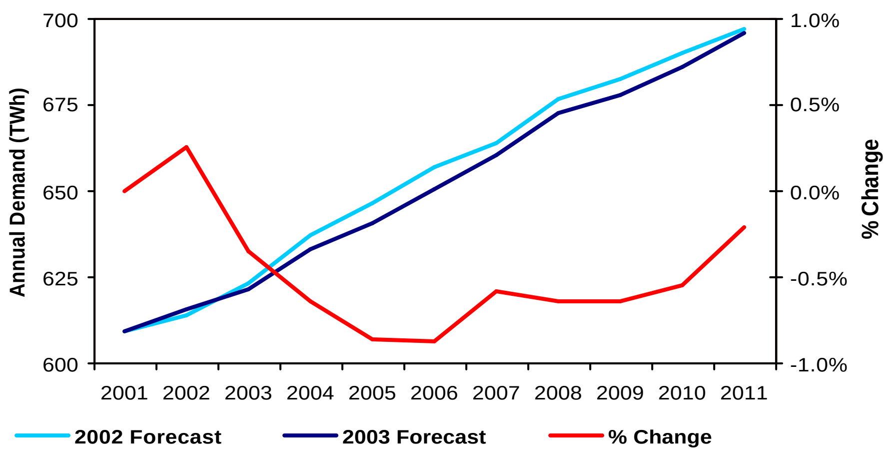
The following charts provide a comparison of the latest demand forecasts with those published in the 2002 TYS. Figure 3.4A shows the total annual DN demand forecasts to be lower over the whole forecast period, being as much as 2.5% down in 2008. The main reasons for the lower forecast are the projections of a less favourable economic climate (particularly in manufacturing), higher gas prices, a reduction in the quantity of new gas-fired CHP capacity and a degree of slippage in the timing of projects that do proceed.

FIGURE 3.4A – Comparison of Total Distribution Network Annual Demand Forecasts



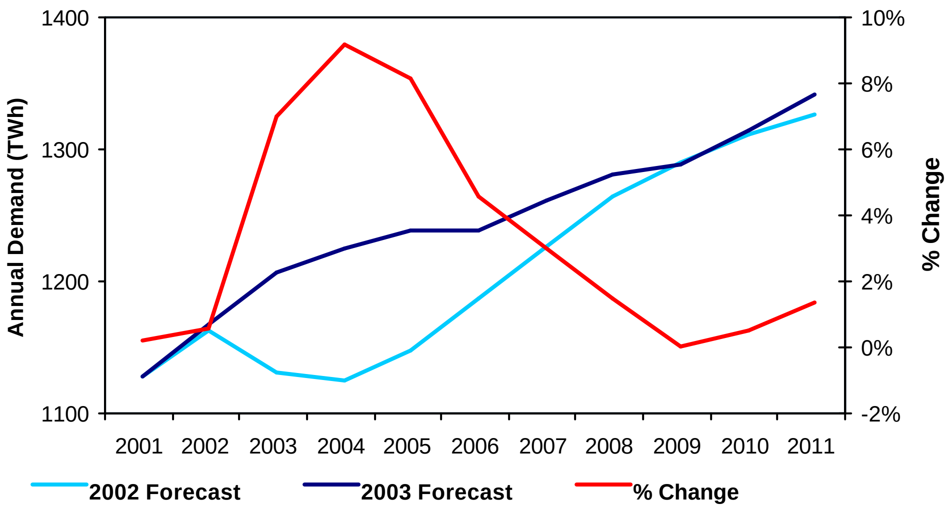

To understand the likely impact that these changes will have on system capacity requirements it is necessary to exclude interruptible demand. Figure 3.4B compares firm DN annual demand and shows that, in comparison to the 2002 forecast, the latest forecast is only marginally lower over most of the forecast period and falls in line with previous projections by 2011. Hence, by the end of the forecast period, the level of DN capacity planned will be similar to that in last year's plan.

FIGURE 3.4B – Comparison of Firm Distribution Network Annual Demand Forecasts



In Figure 3.4C the forecast of flows to NTS supplied loads has been added to that of DN demands to form a view of total system throughput. At this level the latest forecast is higher until 2008 and then falls broadly into line with the forecast produced in 2002. Assumptions surrounding the level of exports to mainland Europe and the late development of the Corrib field, which is still expected to bring new indigenous gas into the Irish market, are the predominant causes of the higher forecast.

FIGURE 3.4C – Comparison of Total System Throughput Forecasts




## 3.5 Alternative Scenarios

### 3.5.1 Demand Sensitivities

An assessment of future growth drivers and their impact on gas demand is an essential part of the forecasting process. The 2003 TBE consultation process provided us with the opportunity to discuss key demand drivers and sensitivities with the industry prior to preparing the demand forecasts presented in this document. In addition to validating our assumptions, the feedback received enabled the consideration of alternative demand scenarios utilising a combination of the following sensitivities.

TABLE 3.5.1 – Demand Sensitivities by Category

| **Demand Sensitivities** | | **Potential Impact Range on Demand** |
|---|---|---|
| Postponement of the Corrib field beyond 2013 increases exports to Ireland | | +23TWh per annum from 2008 |
| Exports to mainland Europe | | ±20TWh per annum |
| Achievement of UK Government's CHP Target of 10GWe by 2010 | | +20TWh (equivalent to +3GWe of addition capacity to that assumed) by 2010 |
| CHP capacity only grows from 4.8GWe to 6GWe by 2010 | | -6TWh (equivalent to -1GWe of CHP new capacity over plan) by 2010 |
| Climate Change Programme (including CCL, Agreement & efficiency measures | | +14 to -5TWh by 2012 |
| Changes in Economic Activity (consistent with ±0.5% in GDP pa) | | ± 11TWh by 2010 |
| Movements in Fuel Prices (consistent with a rise or fall of 10%) | | ± 10TWh by 2010 |
| Closure/rationalisation of a number of large chemical, steel or refinery loads | | +4 to -8TWh by 2012 |
| EU Directive on Large Combustion Plants | | +5TWh (assuming no new plans for FGD other than that under construction) from 2008 per annum |
| EU Emissions Trading | | - 4½ to +2TWh by 2012 |
| Renewable generation growth above the 7% assumed by 2010 but lower than Govt. target | | Up to -3TWh (equivalent to a 250 MWe station) by 2010 |
| Change in the amount of new CCGT capacity ±500 MWe | | ±2½TWh by 2010.<br>High - Peak in 2006/7 & Low - Peak in 2004/5 |
| New Technology e.g. micro turbines, server hosting centres (Internet Hotels), etc | | Up to +2TWh by 2012 |

Table 3.5.1 presents a range for the realistic potential impact of each of the main sensitivities of demand. However, it is very unlikely that these sensitivities would all occur simultaneously, to the same extent or, even for that matter, over the same forecast period. Consequently, two demand scenarios have been developed to represent alternative combinations of the above sensitivities, each scenario reflects the influence of a combination of individual sensitivities to varying extents.

Figures 3.5A & 3.5B illustrate these two realistic alternative demand scenarios for annual and peak demands, developed from the sensitivities highlighted above, and compares the results with the central case forecasts discussed above. The High scenario highlights the greater upside potential due predominately to the impact of Corrib slipping beyond 2013 and additional CHP up to the UK Government's target by 2010. Peak demand scenarios are less variable as these are not sensitive to changes in exports to Continental Europe or interruptible demand.

The Low annual demand scenario shows hardly any growth over the period 2004 to 2009 as losses from slower economic growth, higher prices and their impact on UK and export demand, cancel out the growth from traditional markets and power generation. Conversely, at peak, demand continues to grow until 2008 when the Corrib starts production.

FIGURE 3.5A – Alternative Annual Gas Demand Scenarios

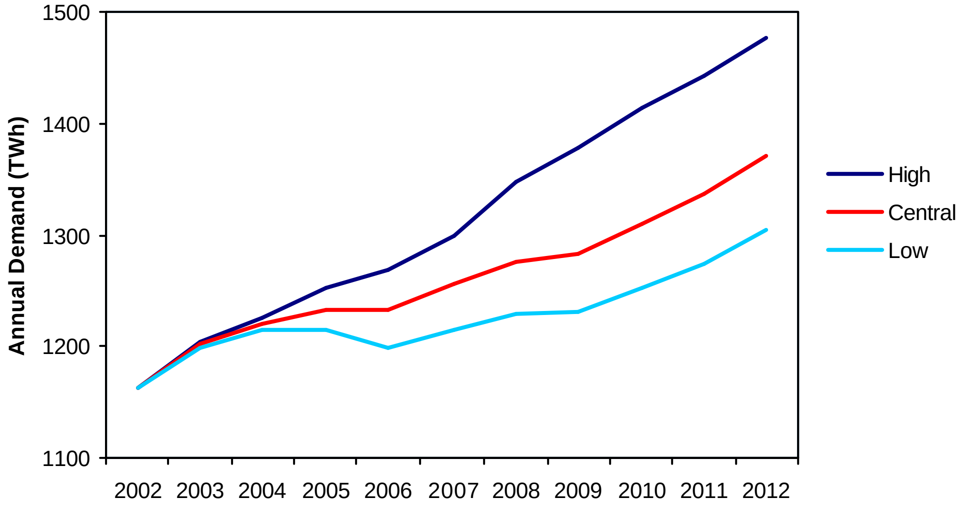
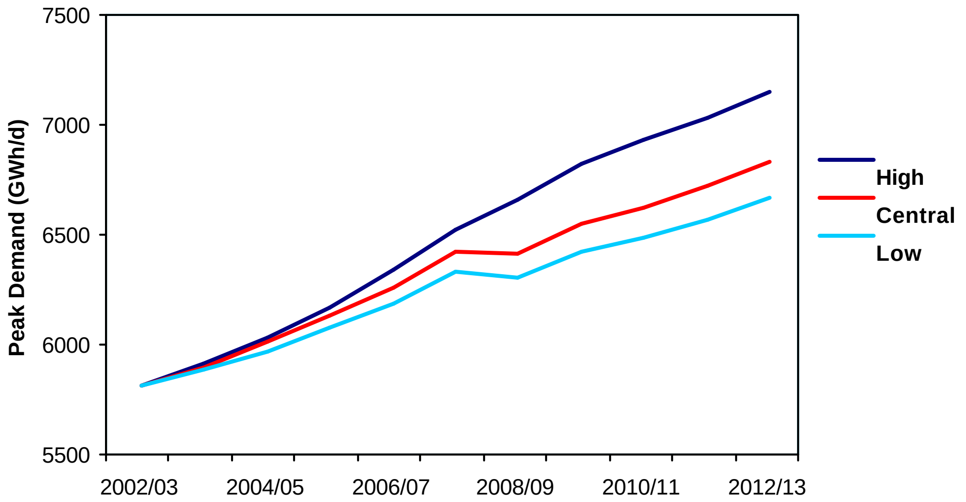



FIGURE 3.5B – Alternative Peak Gas Demand Scenarios



## 3.6 Impact of Global Warming

In 2000, we commissioned an independent study to investigate the impact of global warming on long-term average weather conditions. The subsequent report concluded that there is evidence to support a potential reduction in LDZ/DN demand, based on a long-term average, of up to 5.6%. However, the overall recommendation was for an adjustment of 3.5% based on analysis of the preceding 35 years of weather and, consequently, this 3.5% correction is incorporated within the DN annual demand forecasts shown in Appendix 2. The rate of warming implied by this adjustment is consistent with that reported by climate change experts.

The Network Code requires us to review, and if necessary revise weather variables used for demand estimation daily balancing purposes, at least every five years. The next review is due to take place in 2004 for implementation, following an industry consultation, in October 2005. Currently the Network Code uses an average weather condition based on the last 71 years and therefore makes no allowance for global warming. Consequently, we are planning as part of the review, to consider bringing all weather conditions used for Network Code and planning purposes in line by basing average weather on a time period that more accurately reflects the weather experienced in recent times. This would have the effect of allowing for accelerated global warming.

With regard to peak demand conditions, independent experts have in the past been unable to conclude to what extent extremes of weather will be affected by global warming. Consequently, we consider it prudent to make no adjustment to our 1 in 20 peak day demand forecast at this stage. This approach is supported by the fact that the coldest day over the last 74 years occurred only 16 years ago.

# Chapter Four

## Supply

### 4.1 Overview

The main purpose of our forecasts is to derive supply-demand scenarios that can be used to identify and assess potential NTS investments. For this reason, we may include some supply sources within our forecasts, even though it is far from certain that these sources will materialise. Our forecasts should therefore not be interpreted as a central view, but, rather, a prudent basis for investment scenario planning. Ultimately, investments will only be made where there is firm evidence that they are required. This will be determined through a combination of auction and other signals from consultation with industry stakeholders.

Since publication of the 2002 TYS there have been two Long Term System Entry Capacity (LTSEC) auctions, the first in January 2003 and the second in September 2003. The LTSEC auctions (see Chapter 5 for further details) have so far not provided us with any clear signal that would justify investment above the baseline adopted for our present price control period. Consequently, our supply forecasts continue to be built primarily from information received through a combination of our TBE consultation process and commercial sources.

Compared to last year there is greater certainty regarding the anticipated location of new imports. Our supply scenarios are therefore less extreme in terms of locational variation and are broadly based on proposed import projects rather than previous supply assumptions under which new imports were spread between St Fergus and Bacton.

Our supply forecasts are built up through a combination of the following:

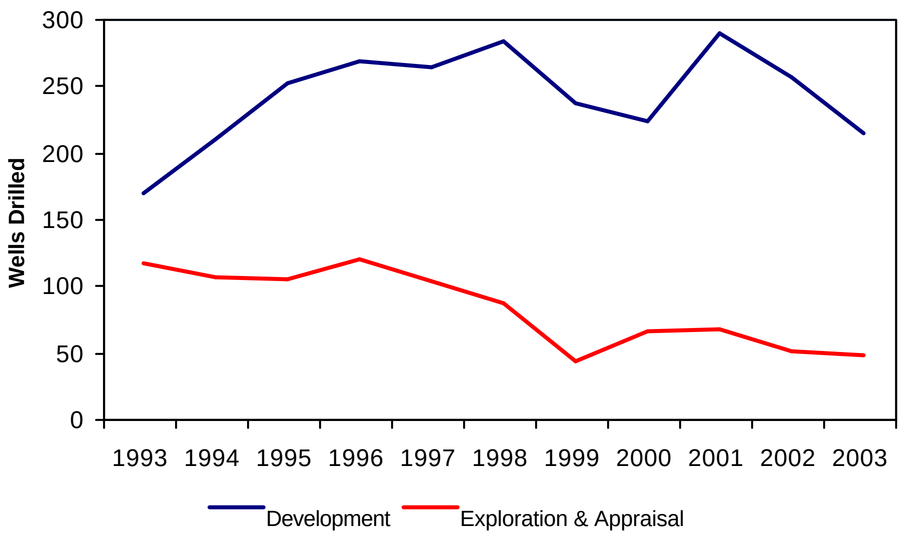
- Expected UK Continental Shelf (UKCS) supplies from fields presently in production, under development or appraisal.
- Imports through existing links (from Norway into St. Fergus via the Vesterled link (Heimdal to Frigg) and from Europe through the Continental Interconnector).
- An assumed upside in UKCS developments.
- New imports based upon proposed projects, to the extent required to meet any remaining deficit.
- Existing and proposed storage developments.

This chapter covers the potential make-up of future supplies to the UK, looking at the rate of decline of the UKCS, the need for further imports and where these imports may come from. This leads to sections on European supply-demand and LNG importation, to put the issue of future supplies into the UK into the context of the broader European and global LNG markets. Supply scenarios are described based upon proposed importation projects. These have been developed by us in order to facilitate the production of investment scenarios. At the end of this chapter the current security of supply issues arising from this supply outlook are reviewed. Appendix 2 presents the supply forecasts in greater detail, while Appendix 3 presents actual supply information from the 2002/03 gas supply year.

## 4.2 UKCS Supplies

As reported in last year's TYS, the UK supply-demand position continues to be dominated by the forecast decline in gas production from the UKCS and the resultant growing dependence on imports. This decline is despite sustained higher prices for oil and gas over the last three years and numerous initiatives to promote further exploration activity. There are many reasons for the forecast decline in UK production even though current rates of approximately 110 bcm/year are close to peak production levels of 115 bcm/year in 2000 (source DTI, production includes offshore losses). The primary reason is the maturity of the UKCS with limited opportunities to find significant prospects. Figure 4.2A shows drilling activity as reported by the DTI in October 2003. The data shows both exploration and appraisal drilling, together with development drilling for the last 10 years. The 2003 data is extrapolated for the final quarter.

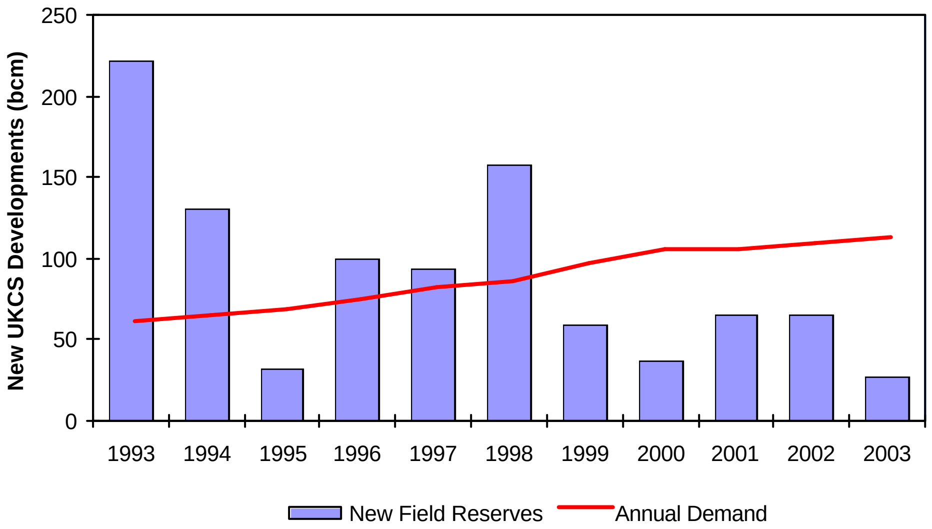
FIGURE 4.2A - UKCS Drilling Trends
Source - DTI




Though lower for the last two years, the chart shows relatively stable levels of development drilling and this is reflected in sustained UK gas production throughout the ten-year period. By contrast the exploration and appraisal drilling shows a noticeable decline from over 100 wells in 1996 to just 44 wells in 2002 with an expectation of fewer in 2003. The decline in exploration and appraisal drilling reflects the maturity of the UKCS. It also indicates that in the longer term the number of development wells drilled will also decline, resulting in a fall in production from the UKCS.

Though a longer-term production decline from the UKCS appears inevitable, proposed developments are still scheduled to start production through to 2006 and expected to continue to produce well beyond that. Indeed, though not explicitly considered in our current supply forecasts, considerable undeveloped reserves remain in specific areas of the UKCS, notably West of Shetland and West of Scotland. These reserves have no access, or only limited access, at present to offshore pipeline infrastructure. Figure 4.2B shows the total aggregated reserves brought on stream each year since 1990. For the UK to remain self-sufficient in gas over a sustained period of time, the aggregated reserves of fields coming on stream each year needs to match the annual level of demand. Any shortfall ultimately needs to be met by imports. With annual demands now greater than 100 bcm per annum, Figure 4.2B shows that since 1998 new UKCS developments have been insufficient to match longer-term demand. The chart also shows that the trend of new developments coming on stream continues to decline.

FIGURE 4.2B – New Field Reserves of UKCS Developments
Source – Deloitte & Touche




As in previous years, we have extrapolated the recent trend of UKCS developments in order to estimate future levels of UKCS production, over and above those presently in production, development and appraisal phases. This so-called 'UKCS upside' is shown in our annual supply forecast in Section 4.4. Though within the range of other reported analyses, our 2002 TYS UKCS upside assumption was perhaps a somewhat bullish view adding over 210 bcm of UKCS production between 2006 and 2012. This year our UKCS upside adds only 113 bcm of UKCS production between 2007 and 2013. The 'loss' of approximately 100 bcm between this year's and last year's UKCS upside is equally split between the loss of the assumed production for fields coming on stream in 2006 (the first and highest year for new fields) and lower production from new fields thereafter based on a lower assumed trend. (For network analysis purposes, the location of the UK upside supplies is assumed to be consistent with the landing points of the fields upon which the trend analysis is based).

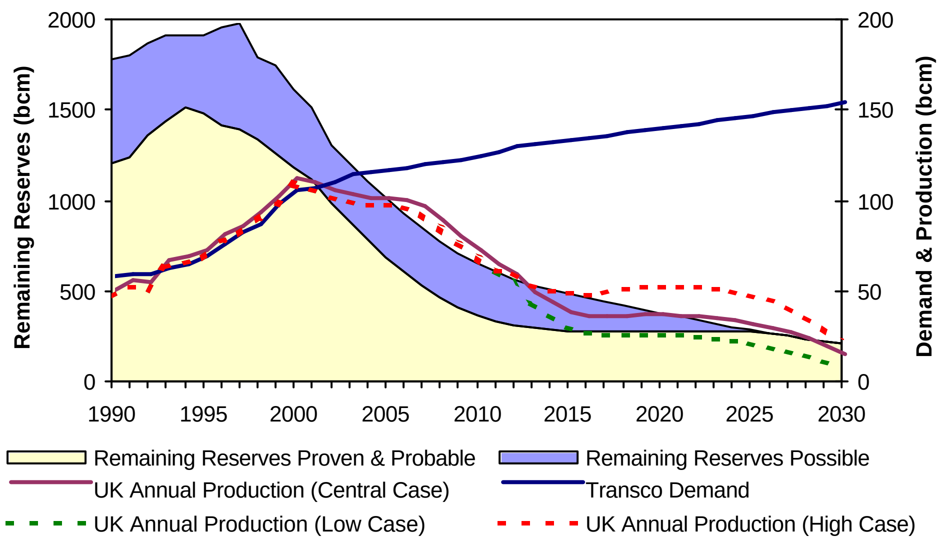
To validate our methodology in determining a UKCS upside we have analysed the DTI's 2002 annual gas reserves statistics. Proven reserves (which include cumulative production) have increased again by 75 bcm from those reported in 2001 (essentially a transfer from other reserve types), while both probable and possible reserves have declined by 140 bcm, resulting in a net reduction of 65 bcm. This compares to current annual UKCS production in excess of 100 bcm. The resultant decline of remaining reserves from the mid 1990s (as shown in Figure 4.2C) highlights the maturity of the UKCS and the possible effects of reduced exploration and appraisal drilling activity.

In addition to proven, probable and possible reserves, the DTI also reports:

- Potential Additional Reserves (PAR) – existing discoveries for which there are no current plans for development and are not currently technical or economically producible; and
- Undiscovered gas or Yet To Find (YTF) – determined by mapping and statistical techniques for each reserves basin.

We have developed a longer-term UKCS supply model to forecast future UKCS reserves and production based on the published DTI data for PAR and YTF gas. Through changing the projections for reserves, longer-term supply scenarios have been developed. Figure 4.2C shows reported DTI reserves since 1990 and a central scenario for remaining UKCS reserves and production. Also shown are projections of future UKCS production for high and low scenarios to provide a range of possibilities.

FIGURE 4.2C - Remaining Reserves & Production Projections
Source – DTI & Transco Forecast



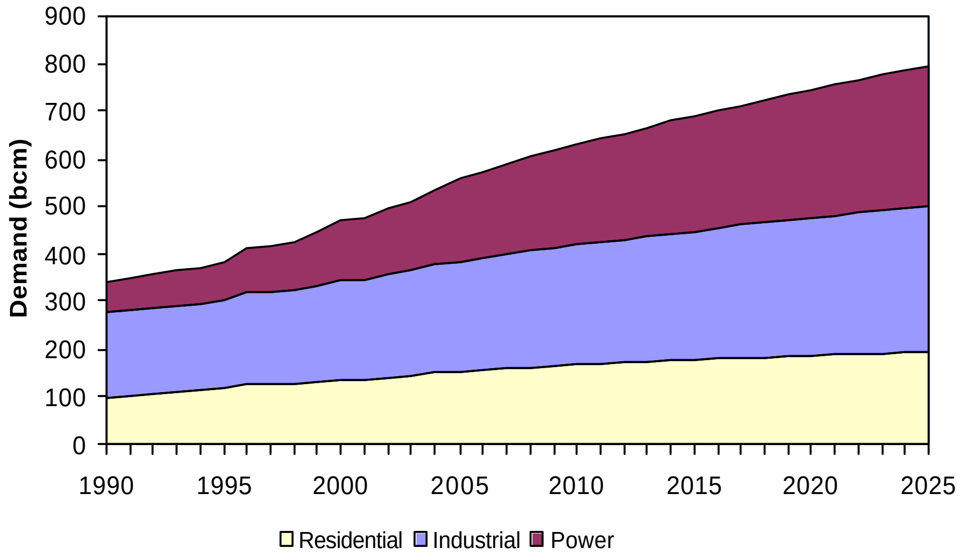

The chart shows a steady decline in UKCS production from over 100 bcm in 2000 to approximately 90 bcm in 2007. Thereafter production is forecast to decline at a greater rate resulting in a 50% import requirement by 2011. This is broadly consistent with our supply forecast detailed in Section 4.4 and therefore supports our basis for estimating a UKCS upside. Figure 4.2C also shows a range of future UKCS production based on the high and low reserves scenarios. These indicate UKCS production between 25 and 50 bcm in 2020 against projected UK demand requirements (based on 1% growth post 2013) of over 130 bcm. This indicates an import dependency in 2020 of 60 to 80%.

# 4.3 Imported Supplies

## 4.3.1 European Gas Demands

European gas demands, as shown in Figure 4.3A, continue to increase in all sectors, with the power generation sector showing particularly strong growth. In the period through to 2010, growth in gas demand for power generation is forecast to be particularly strong in Italy, Germany and Spain; in the longer term Turkey and France also show strong growth. This growth can be compared with the so-called ‘dash for gas’ in the UK in the 1990’s.

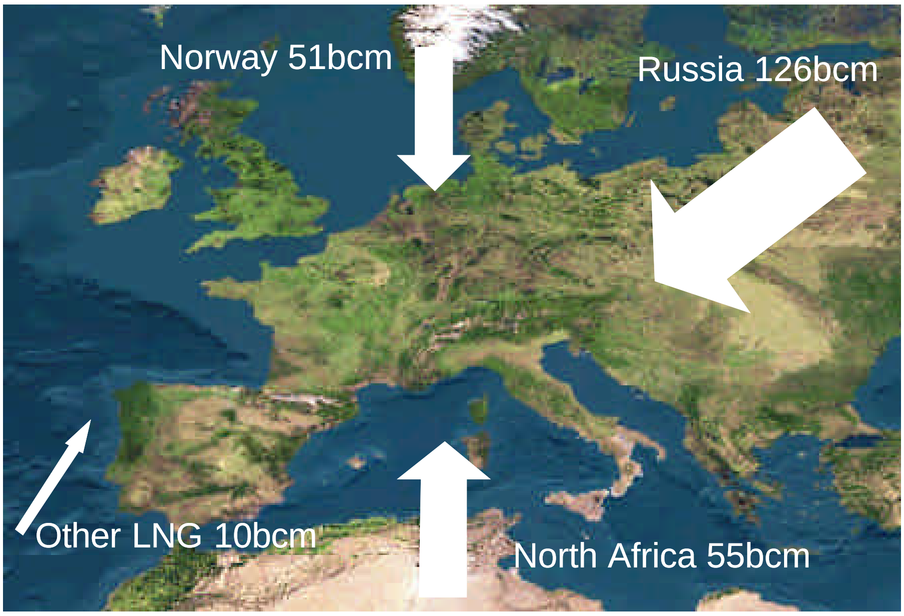
FIGURE 4.3A - European Demand by Sector
Source - Global Insight, forecasts based on a bottom -up sector-by-sector assessment of gas demand in 23 European countries




## 4.3.2 European Gas Imports

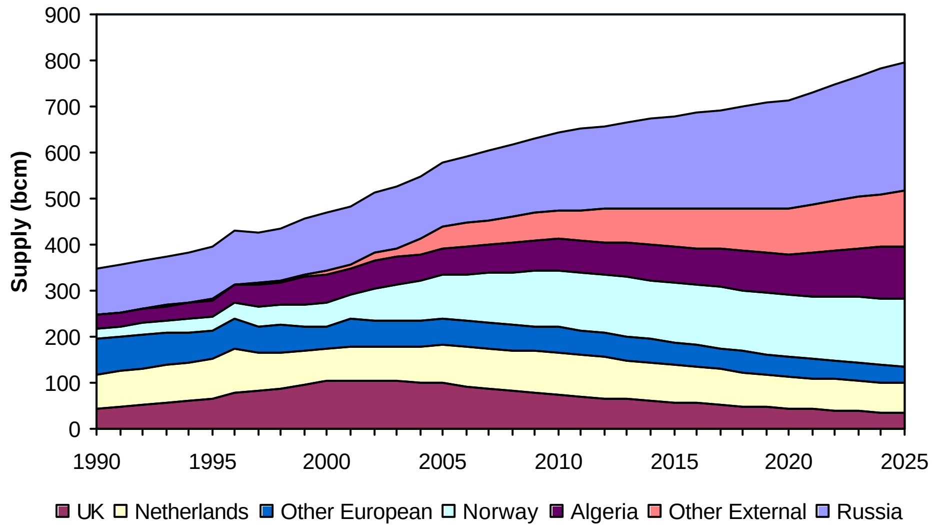
In order to satisfy existing demand levels, Europe is already a major importer of gas from diverse sources, Norway to the north, Russia to the east, North Africa to the south and LNG from Africa, the Middle East and Trinidad & Tobago

FIGURE 4.3B - 2001 European Gas Imports
Source BP, Statistical Review Of World Energy 2003



With European demands set to increase (Figure 4.3A) and levels of indigenous gas production forecast to decline, imports of gas to Europe will necessarily have to increase. Figure 4.3C shows European supply sources since 1990 and a forecast of future levels.

FIGURE 4.3C - Sources of gas to Europe
Source - Global insight , supply forecasts based on the existing contractual position (and assumed prolongations), with the supply gap met by capacity and cost of delivery considerations

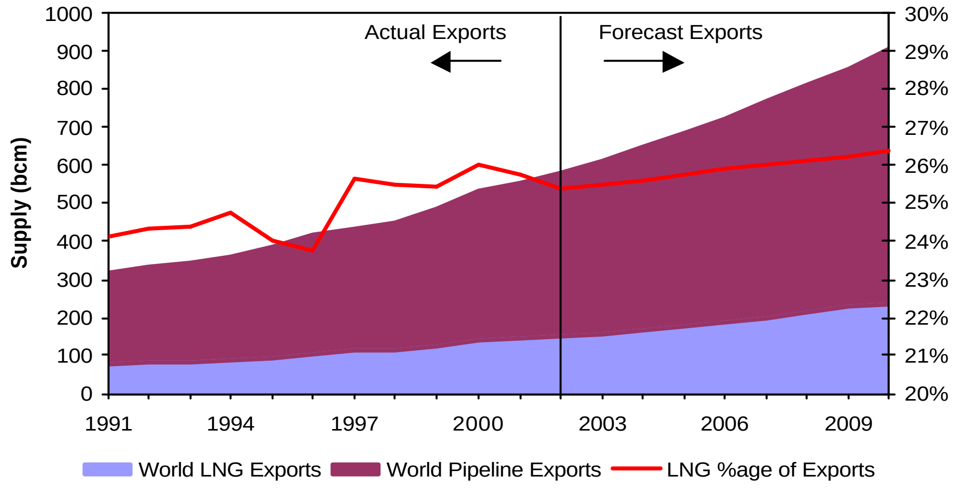



With regard to European supplies, the chart shows a noticeable decline in UK production, sustained production from the Netherlands and other European sources and significant increases in Norwegian production from current levels of about 70 bcm to 130 bcm by 2012/13. Even so, non-European supplies are forecast to grow from 200 bcm in 2000 to over 500 bcm in 2025. These imports are anticipated to come from Russia (54%), Algeria (22%) and other sources (24%). The latter includes all LNG other than Algerian LNG.

### 4.3.3 LNG - Global, Europe and the UK

Figure 4.3D shows the historical growth in worldwide gas exports, and projected growth based on recent trends. In the period 1991-2001, pipeline exports have grown by around 5% and LNG by 6%, and consequently LNG's share of the world export market has increased.

FIGURE 4.3D - World Pipeline & LNG Exports
Source: ENI Oil & Gas Review 2003, Various.

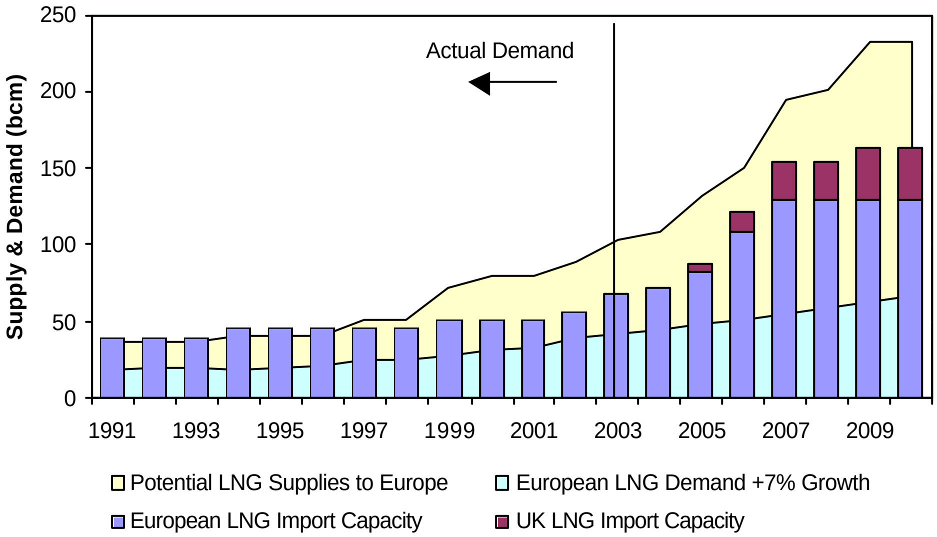



The trend of increasing LNG trade is expected to continue as LNG exporting countries are driven by the desire to monetize their gas reserves and to access markets beyond pipeline distances. Historically, LNG exports have been delivered under long-term contracts, which could be designed to cover project development and LNG shipping costs. Although we expect that the industry will continue to be dominated by these factors, short-term contracts and spot trading are expected to become more prominent. According to the International Energy Agency, spot trading between 1992 and 2001 increased from 1 bcm to 11 bcm, which expressed as a percentage of total LNG trade is an increase from approximately 1% to 8%.

Relatively high prices in the North American natural gas market (in the 20p-60p/therm range) have generated intense interest in LNG imports in recent years. This has been reflected in the amount of terminal activity; two plants have been de-mothballed and nine are in the planning stages. A further four are being planned in Mexico, which could ship excess gas to the US west coast via pipelines. However, US buyers appear not to be signing up for long-term contracts, perhaps due to perceived financial risk, with the market seen to be too volatile. A possible result is that spot cargoes are currently being drawn across the Atlantic, and further growth in LNG deliveries to the US may be hampered until investment in shipping is made.

Figure 4.3E shows the European picture. Since 1990, growth in LNG supplies to Europe has been 7% per year, and for illustrative purposes this trend is assumed to continue. However, proposals for import capacity and potential sources to supply European markets far exceed this growth. This is reflected in new import terminals and expansion planned or in progress in many parts of Europe, including the UK, Greece, Cyprus, Portugal, Spain and Italy.

FIGURE: 4.3E - European LNG picture
Source - Various, ENI Oil and Gas Review 2003

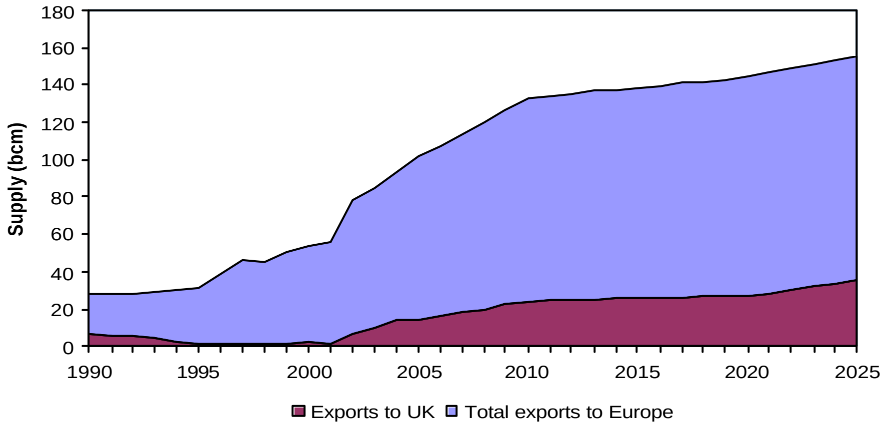



The UK is attracting interest among potential developers of LNG importation projects. Grain LNG has announced a deal with BP and Sonatrach to use the existing Isle of Grain site for LNG imports from 2005. Grain LNG has also applied for planning permission to triple the size of the available storage on site. Elsewhere Milford Haven continues to attract interest with Petroplus/BG Group and Qatar Petroleum/ExxonMobil investigating opportunities for LNG imports from 2007.

### 4.3.4 Norwegian Gas Imports to the UK

Norwegian gas is expected to play an increasingly key role and meet a significant proportion of the UK's import needs. The UK imported over 3 bcm from Norway in 2002. There are already plans to increase Norwegian imports via the proposed new pipeline between the Ormen Lange field and Easington, which would have the potential to supply 15-25 bcm per annum. With the decline in indigenous UK supplies, there are also opportunities to exploit ullage in existing UKCS infrastructure. Indeed, Statoil has recently announced its intention to import 4 bcm per annum through the FLAGS pipeline to St Fergus from 2007. Figure 4.3F shows the growth in Norwegian exports to Europe and the UK's share since 1990 with a forecast through to 2025. The chart shows a very strong view of future Norwegian exports to Europe, increasing from existing annual levels of around 70 bcm to 100 bcm in 2005 and over 150 bcm by 2025.

FIGURE 4.3F – Forecast Norwegian gas exports to Europe and UK
Source - Global Insight, supply forecasts based on the existing contractual position (and assumed prolongations), with the supply gap met by capacity and cost of delivery considerations




## 4.3.5 Other Gas Imports to the UK

Interconnector UK (IUK), the owner/operator of the Continental Interconnector between Bacton and Zeebrugge, is installing compression at Zeebrugge to increase the Interconnector's annual import capacity to the UK from 8 bcm to 16.5 bcm from 2005. It is also consulting with IUK users on options for further expansion. Gastransport Services (part of Gasunie) are also currently considering options for a new pipeline (BBL) connecting Balgzand (Netherlands) with Bacton, which is expected to be designed for UK imports only.

Figure 4.3G summarises potential import projects to the UK. These are listed in Table 4.3A, which also summarises proposed storage projects. The map also details the proposed expansion of the Zeebrugge LNG terminal and proposals for a North European pipeline as, indirectly, these projects may ultimately supply the UK via the existing Continental Interconnector and/or the proposed BBL pipeline.

FIGURE 4.3G - Potential UK Import Projects

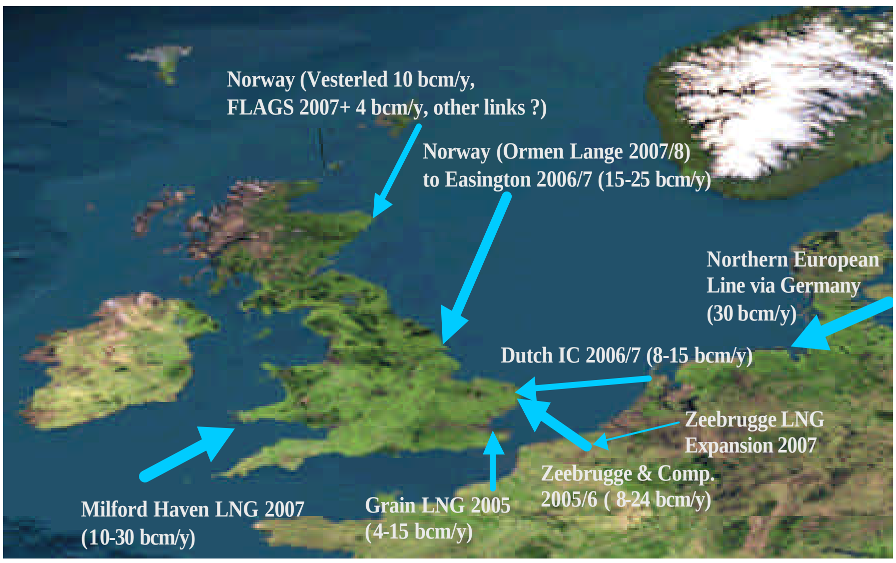


TABLE 4.3A - Potential New Import and Storage Projects

| Import Project | Developer | Location | Size | Date | Status |
|---|---|---|---|---|---|
| Interconnector Comp. (Phase I) | IUK | Zeebrugge to Bacton | extra 8 bcm | 2005/6 | Under construction |
| Interconnector Comp. (Phase II) | IUK | Zeebrugge to Bacton | further 8 bcm | 2007/8 | Under review |
| Ormen Lange | OL Partners | Ormen Lange field via Sleipner to Easington | 15-25 bcm | 2006/7 | Pipeline contract awarded, government approval sought, import treaty principles agreed |
| Other Norwegian | Numerous possibilities | Use of existing UKCS infrastructure | 10+ bcm | 2007+ | Use of FLAGS for Statfjord agreed (~10 mcm/d) |
| BBL pipeline | GTS | Balgzand to Bacton | 8-15 bcm | 2006/7 | Project approval sought, capacity assessment underway, import treaty required |
| Isle of Grain LNG | NGT | Isle of Grain | 4 bcm | 2005 | Under construction, capacity sold to BP / Sonatrach |
| Isle of Grain LNG | NGT | Isle of Grain | Further 10+ bcm | 2006+ | Planning permission sought for further storage |
| Milford Haven (Petroplus/BG Group) | Petroplus | Milford Haven | 10 bcm | 2007 | Planning permission granted for 3rd tank, prelim site constructed |
| Milford Haven (Qatar Petroleum / ExxonMobil) | Qatar Petroleum / ExxonMobil | Milford Haven (North Hook) | 10 bcm expansion to 20 bcm | 2007<br>2009 | Planning application granted, project approval sought |

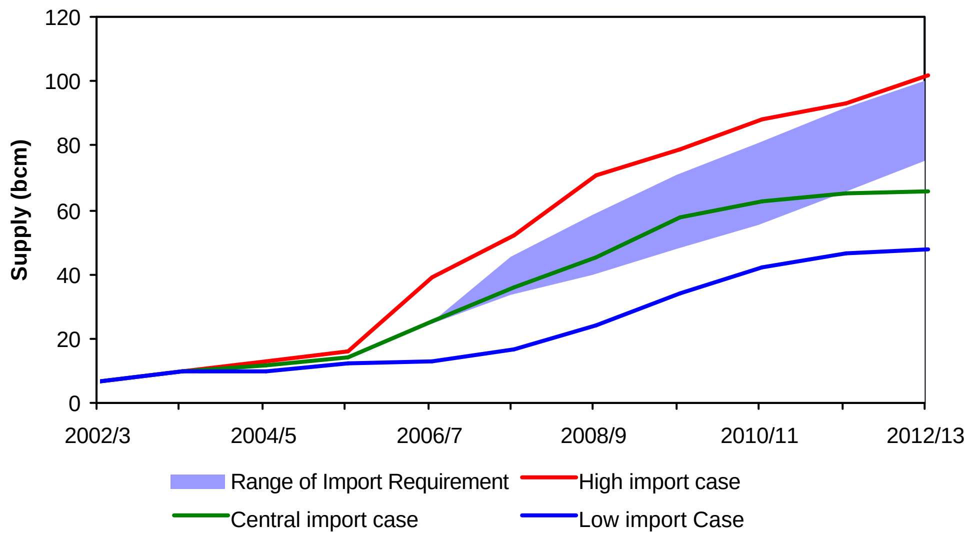
TABLE 4.3A - Potential New Import and Storage Projects (contd.)

| **Storage Project** | **Developer** | **Location** | **Size** | **Date** | **Status** |
|---|---|---|---|---|---|
| Aldbrough (South) | Statoil | Aldbrough | 140 mcm | 2007/8 | Combined development agreed, planning permission granted |
| Aldbrough (North) | SSE | Aldbrough | 280 mcm | 2007/8 | |
| Cheshire | Scottish Power | Byley | ~300 mcm | 2007/8 | Planning Permission still to be granted |
| Humbly Grove | Star Energy | Humbly Grove | 280 mcm | 2005/6 | Planning agreed |
| Welton | Star Energy | Welton | 280 mcm | 2006/7 | Conceptual engineering |
| Lancs | Canatxx | Fleetwood | 400-500 mcm | 2006/7 | Conceptual no planning submitted |

While the level of activity described above is encouraging, there remains considerable uncertainty over this project list: which projects will ultimately proceed; in what timescales; and, what profiles of volumes will be delivered? This is not surprising as delivery of all of the projects in accordance with the developers' stated plans would lead to a significant supply surplus in the medium term. This uncertainty translates into uncertainty over the future profile of supplies into the UK gas market and the necessary investment in the NTS to accommodate the resultant flow patterns.

Figure 4.3H shows the range of imports required in the UK based upon the forecast range of the UKCS upside. Overlaid are three cases of import project development, which are not identical to the supply scenarios in section 4.4, but represent a view of import expectations. The cases (consistent with those shown in Figure 4.5A) represent different project delivery dates and levels of initial project size and subsequent expansion. Whilst a range of imports is identified, the market would be expected to self-correct to produce an import capability closer to the central case. Furthermore, in any of these import cases, there would be scope for some additional imports above the levels shown through use of interconnectors at higher than assumed load factors. Bearing this in mind, the chart illustrates that with the assumed UKCS upside, the central case for new importation projects is sufficient to meet the annual import requirement out to 2010/11. Beyond 2010/11 a more aggressive build-up of importation projects than assumed in the central case would be required.

FIGURE 4.3H - Import Project projections

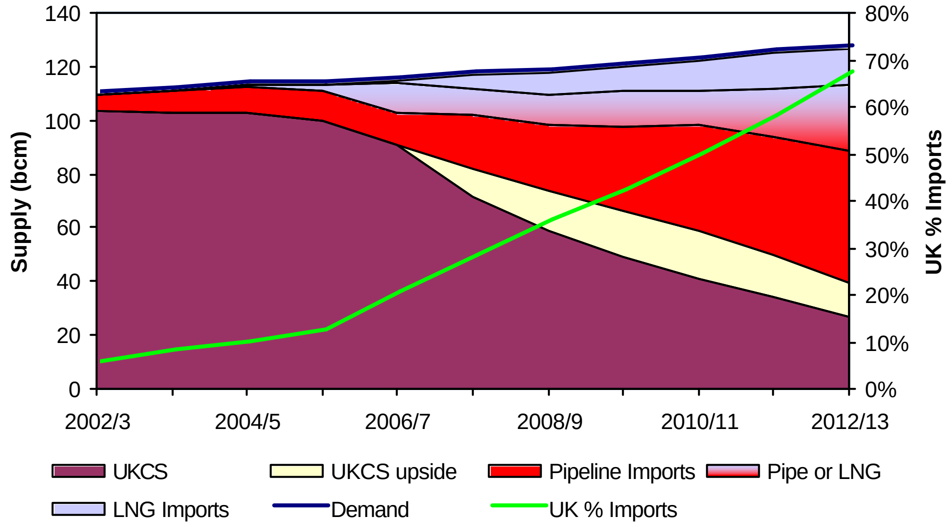



## 4.4 Supply Scenarios

In order to manage the uncertainty associated with the future locational profile of gas supplies, in particular new imports, we have developed two supply scenarios against which potential investment requirements have been identified. The first is a Pipeline scenario, which gives weight to increased interconnectivity with Europe; the second places greater emphasis on LNG Importation. Given the emerging clarity over the location of new imports, these supply scenarios are less extreme in terms of locational variation than the scenarios that we used last year. They are based on proposed import projects rather than the more general supply assumptions that underpinned last year's Northern and Southern scenarios, where the bulk of new imports were assumed at St Fergus and Bacton respectively.

Both supply scenarios include pipeline imports and LNG imports, however they differ in the dominance of one type of project over the other. The true picture will probably lie somewhere between these two positions. Figure 4.4A shows the forecast pipeline imports, LNG imports and those imports that could be sourced by either pipeline gas or LNG; it is this latter category which is the difference between the two scenarios. In both scenarios the UK is 67% import dependent by the end of the ten-year period.

FIGURE 4.4A - Annual Supply Forecast




The Pipeline scenario is primarily based on increased imports from:

- Norway through the proposed pipeline to Easington;
- Netherlands through the proposed pipeline to Bacton (which in later years is assumed to be compressed to provide additional volumes);
- Belgium through increased imports and further compression on the existing Continental Interconnector;
- Norway in later years through existing UK offshore infrastructure to St Fergus, Teesside and Bacton; and
- LNG imports to Milford Haven and the Isle of Grain

In summary, this scenario is primarily based on new supplies to eastern England.

The LNG Importation scenario is primarily based on increased imports into:

- Milford Haven;
- Isle of Grain;
- and imports (lower than under the Pipeline scenario) from Norway and the Continent

Whilst this scenario also assumes substantial new supplies into eastern England, there are also significant additional supplies into South Wales.

Figures 4.4B and 4.4C show actual annual terminal supplies since 1991 and forecast supplies through to 2012 for the Pipeline and LNG Importation scenarios respectively. Further details of the supply forecasts for both scenarios for annual and peak conditions are shown in Appendix 2.

FIGURE 4.4B - Terminal Supplies for Pipeline Scenario

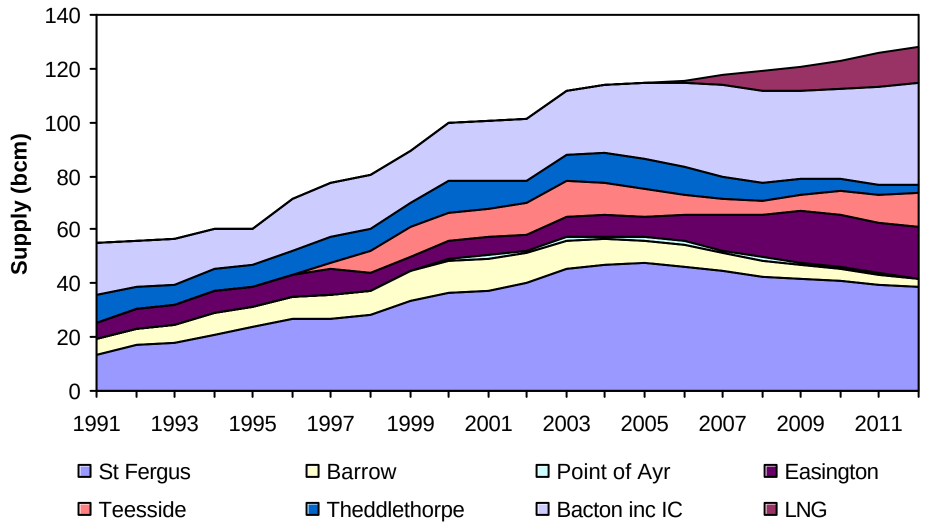
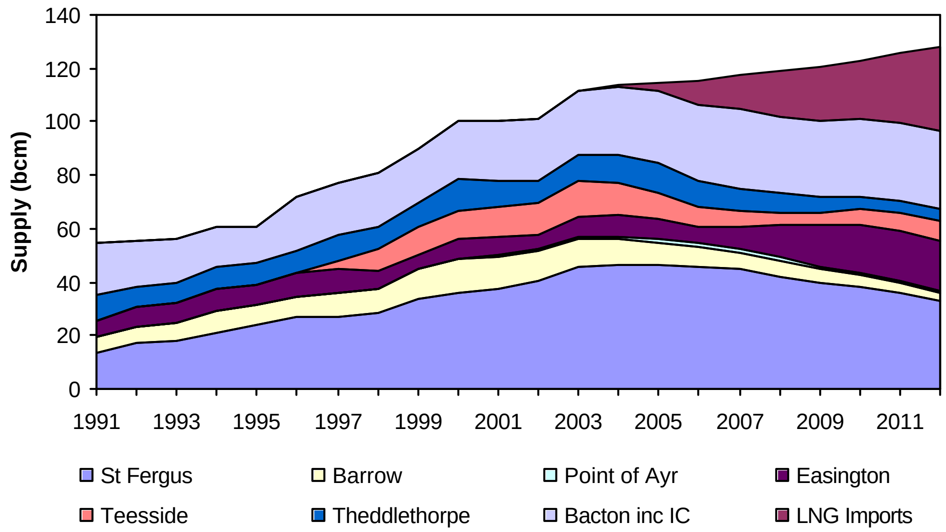



FIGURE 4.4C - Terminal Supplies for LNG Importations Scenario

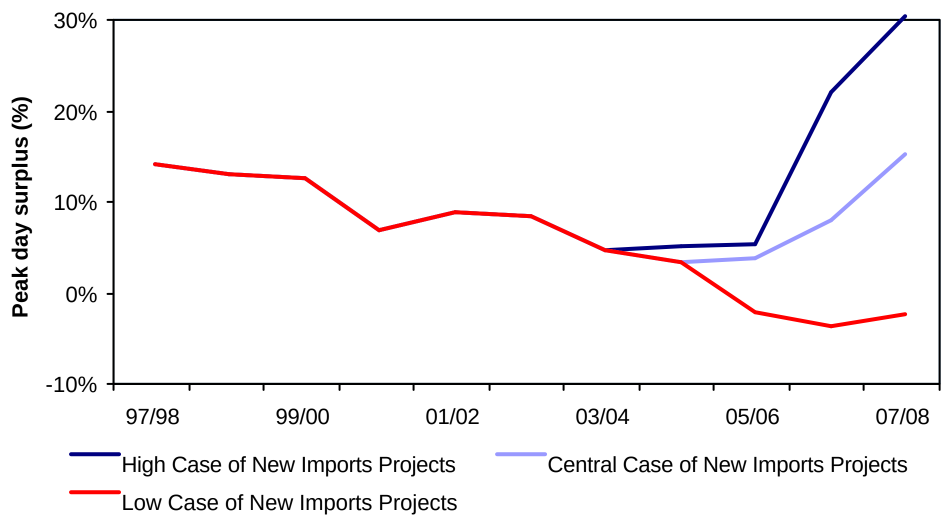



## 4.5 Security of Supply Implications

The number and scale of new import and storage projects presently under development provide encouraging evidence that the market is responding to the tightening UK supply-demand position. Figure 4.3G shows that there are more than sufficient potential projects to meet the needs of the UK market over our ten-year planning horizon. Many of these projects are technically challenging and are working to tight timescales. Indeed, in our view, the key security of supply issue associated with the rapidly increasing import dependency is one of timing. Given the sharpness of the projected UKCS decline, the timely arrival of new supply sources will be important in order to maintain an ongoing balance between demand and supply. However, investors in new import and storage projects are unlikely to have commercial incentives to complete their projects in advance of the market requirement. We can therefore expect to see a 'just in time' philosophy applied to these projects, leading to a risk of supply shortfalls should material delays occur.

Focusing on the well-established 1 in 20 peak day security standard, Figure 4.5A shows the trend (historical and forecast) in the margin of maximum peak supply over the 1 in 20 peak day. This demonstrates that the peak day position has tightened significantly and will continue to do so until the completion of new import and/or storage projects. The high case assumes that the bulk of the reported import and storage projects proceed to their stated timescales and volumes, while the low case discounts some of these projects and assumes a level of delay to others. The difference between the central and low cases illustrates the timing risk described above.

FIGURE 4.5A - Peak Day Supply Margin




In relation to the 1 in 50 winter security standard, our analysis indicates that 2005/06 is the first year in which there is a clear dependency on new importation infrastructure to provide this level of security. In the intervening winters, there is sufficient gas forecast to be available through existing routes. However, 1 in 50 security will be dependent on market behaviour, particularly in relation to the use (and preservation) of storage stocks and the delivery of beach gas at levels close to our maximum forecast for sustained periods. Our concerns in relation to these issues are articulated in our recent Winter Operations Report[1], which we provided to Ofgem ahead of the 2003/04 winter.

In the longer term, 1 in 50 winter security will depend upon sufficient flexibility being provided by the market, through a combination of beach/interconnector swing, storage, contracted interruption and other demand-side responses. Many of the UKCS fields now in decline are the high-swing Southern Basin fields, which have provided a significant level of beach flexibility for many years. If these are replaced by flexible import sources, such as interconnecting pipelines operating (at least initially) at low load factors, this could meet the requirements for future supply flexibility. However, many of the proposed importation projects are planning to operate at high load factors in order to optimise their

[1] www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/4787_NGT_Winter_Operations_Report_Oct03.pdf

project economics. If (on average) depleting high swing fields are replaced with lower swing import sources, and assuming a tight annual supply-demand balance, the implication is that other forms of flexibility will be required. This is particularly the case given UK's relatively low level of storage capacity (as a proportion of annual demand) compared with other major European countries. Additional flexibility could come in the following forms:

- New storage capacity. A number of parties are developing potential storage projects (see Table 4.3A above), although these are all small compared with Rough (the UK's only long duration seasonal storage facility). Taken together they would increase the UK's total storage capacity by nearly 50%, although it is far from certain that all of these projects will proceed. The development of an additional Rough-type facility would be a major undertaking, not least from a cost perspective. There has been no recent suggestion in the public domain of any serious consideration of such a scheme.
- Additional interruptibility. This would require a reversal of recent market trends, as market intelligence suggests a significant shift in the industrial and commercial interruptible market towards Transco-only interruptibles. Under such arrangements, suppliers may no longer interrupt the customer's supply unless required to do so by Transco. The effect of this is to reduce the level of demand-side flexibility available for supply-demand balancing purposes.
- Demand-side flexibility from firm customers. The most significant potential for this form of flexibility comes from the gas-fired power generation sector. Such responses will be driven by the relationship between prices in the gas and electricity markets. Assuming that we continue to see relatively low electricity plant margins, the scope for material levels of demand-side response appears limited, particularly in the absence of back-up facilities at the bulk of these stations.

The tightening supply-demand position and the rapidly growing import dependency also raise the issue of whether the present commercial and regulatory framework can facilitate the type of 'insurance investment' (both upstream and onshore) that would help safeguard against a major supply shock, such as the prolonged loss of a key sub-terminal. Consistent with our concerns in this regard, the proposed EU directive on gas security of supply would require Member States to put measures in place to safeguard against the possibility of a certain level of supply disruption. This would be in addition to meeting weather-related security criteria, such as our 1 in 20 peak and 1 in 50 winter standards.

# Chapter Five

## NTS Capacity Provision and Investment

### 5.1 Introduction

The assessment of future transmission capacity requirements distinguishes between system entry and system exit. At exit, we undertake a central demand forecasting process, as described in Appendix 1, to establish 1 in 20 peak day demand forecasts. The NTS is then analysed to ensure that this demand level can be transported in future years and, if not, identifies the optimum system reinforcements necessary to meet these demand levels. This reflects our Gas Transporters' Licence obligation to provide transportation capacity consistent with meeting 1 in 20 peak day demand.

In respect of NTS system entry capacity, mechanisms are in place that are designed to:

- Provide shippers with the opportunity to secure long-term rights to NTS entry capacity through an auction process.
- Release long-term entry capacity rights in response to signals received and, where appropriate, invest to meet the expected supply pattern.

Since the publication of the 2002 TYS, two LTSEC auctions have been held; in January 2003 (covering the period October 2005 to March 2019) and in September 2003 (covering the period October 2006 to March 2020).

The auctions have not provided a sufficient signal to justify releasing capacity into the long-term over and above the levels that we are obliged to make available under our Gas Transporters' Licence.

Given the immaturity of signals from the LTSEC auctions, the 2003 investment planning process has been undertaken on a similar basis to those conducted in previous years, with the TBE consultation process providing the primary source of information. As explained in chapter 4, we have not run a central development case, preferring instead to analyse two supply scenarios: the Pipeline scenario and the LNG Importation scenario. From these scenarios, an 'envelope' of plausible investment requirements has been developed.

This chapter presents the currently approved NTS reinforcement projects, those that are presently under consideration for construction from 2005 to 2007 and aggregate investment scenarios consistent with the supply scenarios detailed in chapter 4. Maps showing the current NTS and LTS transmission systems and approved future investments are presented in Appendix 4.

## 5.2 Recent Developments

The most notable recent development in the area of NTS capacity provision has been the running of two LTSEC auctions.

In January 2003 some 24,000 bids were received from 25 shippers. The results did not justify the release of obligated capacity beyond the minimum we are obliged to offer for sale under the terms of our Gas Transporters' Licence. However, for 3 quarters within the period from January 2004 to March 2006, some non-obligated entry capacity was released in respect of St. Fergus.

In September 2003 4,455 bids were received from 12 shippers. Three terminals (St Fergus, Bacton and Barrow) received bids out to 2020 but on a sharply declining basis. Bids were received for Easington out to 2019 for some 50% of the minimum available winter capacity. No incremental capacity (neither obligated nor non-obligated) has been released following this LTSEC auction.

The following graphs detail the results of the January 2003 and September 2003 auctions (the latter aggregated with January's results). They show allocated capacities compared to the baseline entry capacities we are obliged to offer for sale as defined in our Gas Transporters' Licence. The LTSEC auctions offer for sale 80% of this baseline capacity, 20% being reserved for release in shorter-term system entry capacity auctions. Until modified by Ofgem, it is assumed that baseline entry capacity levels will stay constant beyond 2007 at the 2007 levels.

FIGURE 5.2A - St Fergus Entry Capacity

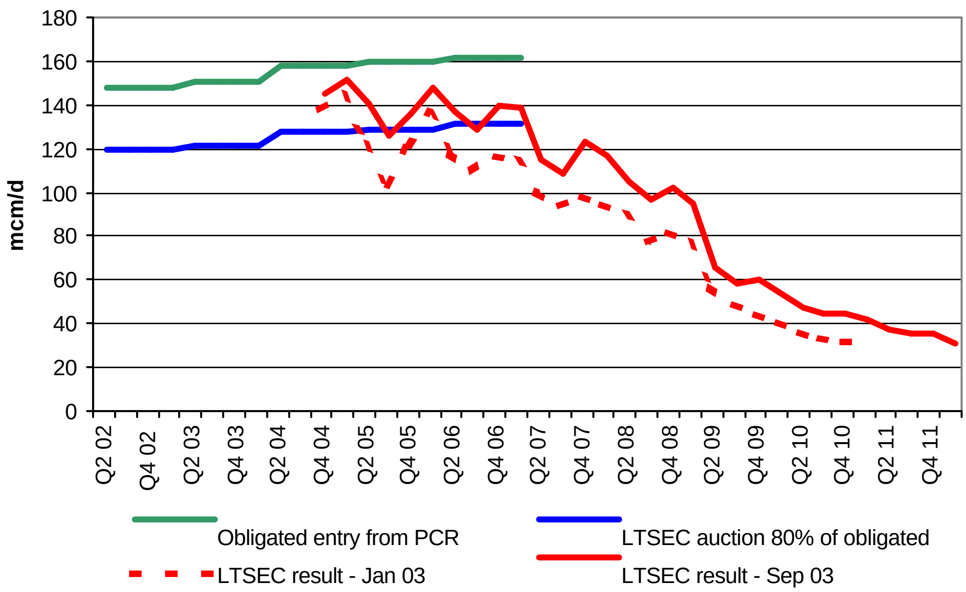


FIGURE 5.2B - Bacton Entry Capacity

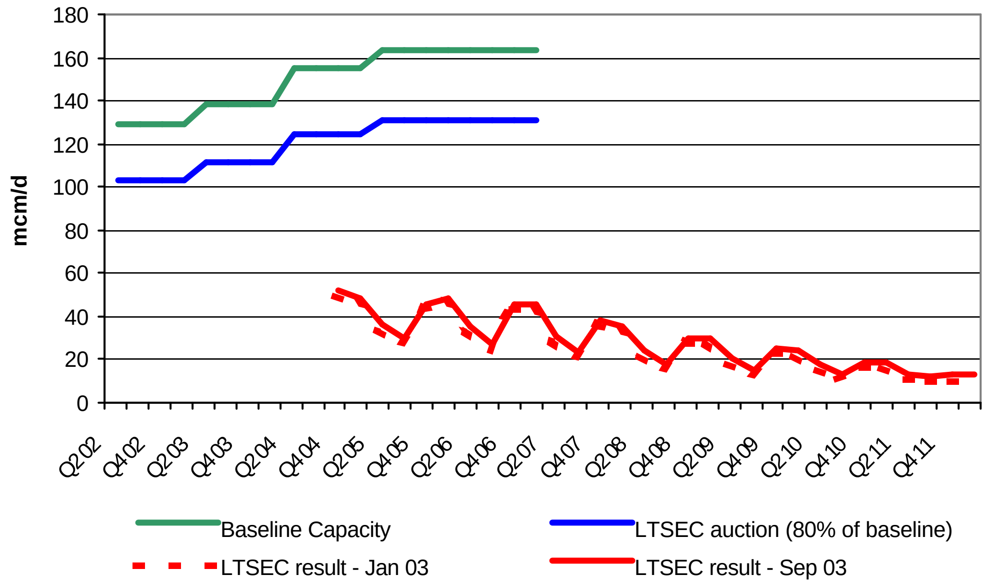



FIGURE 5.2C - Barrow Entry Capacity

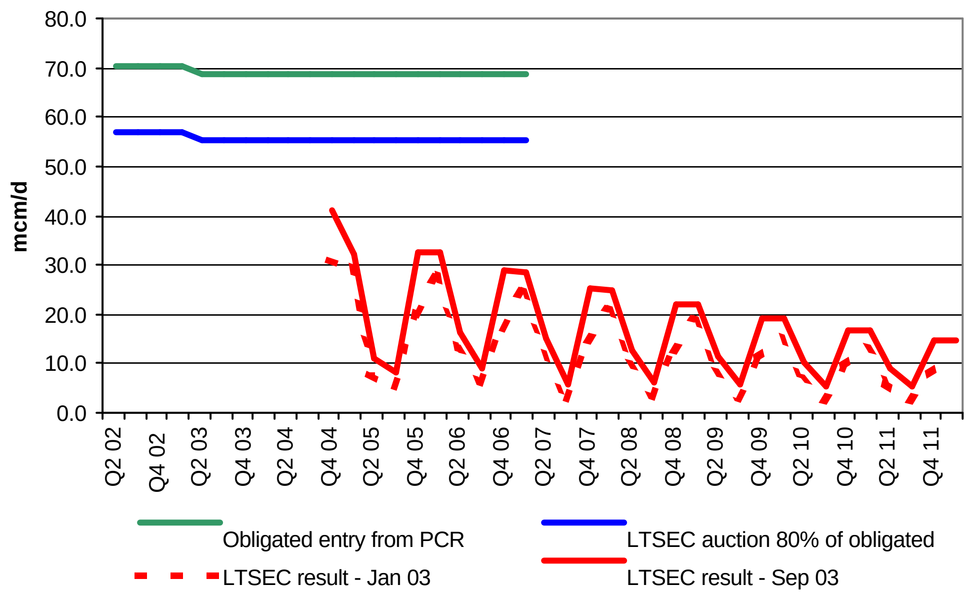


FIGURE 5.2D - Easington Entry Capacity

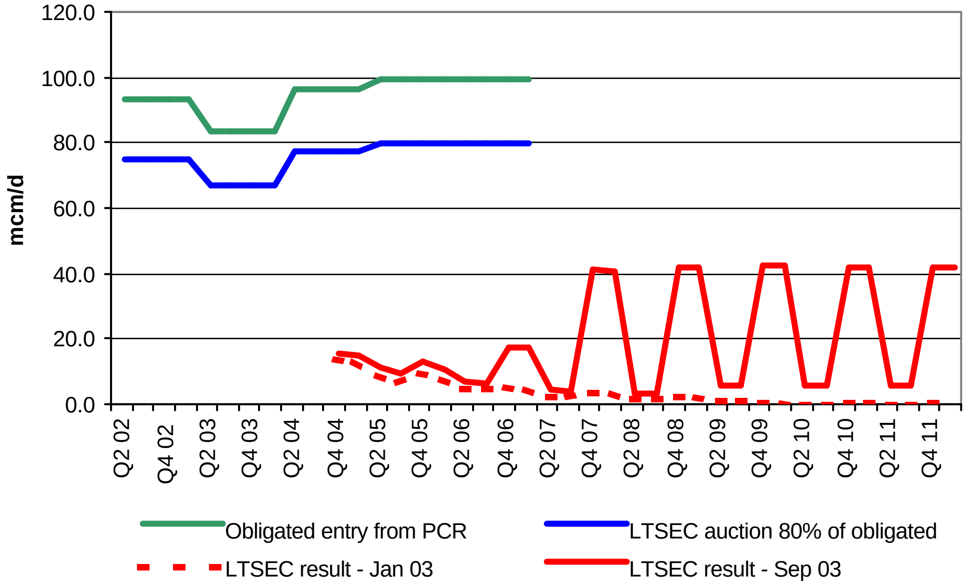



FIGURE 5.2E - Theddlethorpe Entry Capacity

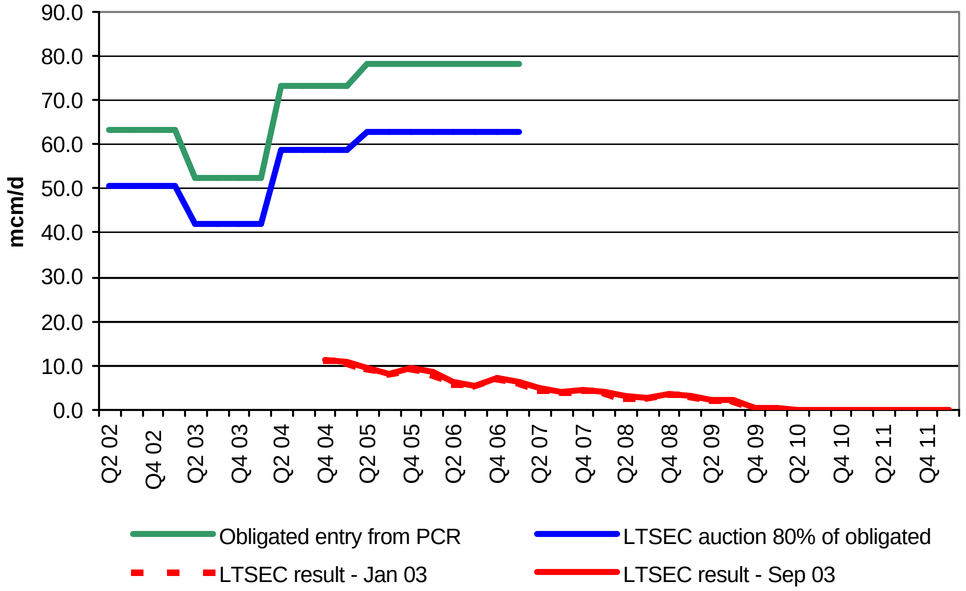
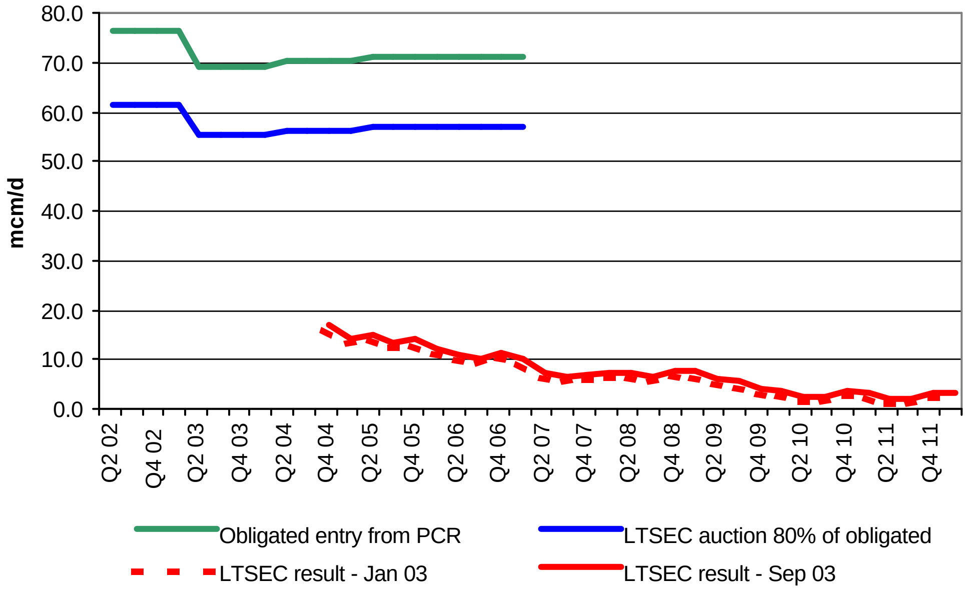


FIGURE 5.2F -Teesside Entry Capacity




When comparing the auction signals to our supply scenarios there are some points of interest. In particular, there have been no bids received for capacity at Milford Haven, and there have been relatively low levels of bids received at Bacton and Easington, compared with the forecast future levels of supply at these entry points.

The absence of a signal at Milford Haven is significant as there is no existing infrastructure to accommodate new gas supplies at this location. The difficult nature of the terrain in West Wales is such that a timely investment signal will be particularly important in order to allow a sufficient construction lead-time for the required NTS extension.

Additionally, undertaking any investment on the NTS is becoming increasingly challenging as a result of changes to environmental legislation and increased landowner resistance. This latter factor presents the largest risk to timely delivery of future NTS investments and is reflected in the number of Compulsory Purchase Order proceedings (CPOs) that we have had to initiate in recent construction seasons. In response to these pressures, we are continuing to develop our contractual strategy and risk management procedures and are actively developing the application of new technologies to minimise the intrusion of our assets upon the natural environment.

A final notable feature of the auction results is the lack of a market signal to justify undertaking “summer flexibility” expenditure. This is particular shown in the graphs above by the considerable seasonality in the bookings.

# 5.3 Investment Plans and Scenarios

## 5.3.1 Investment Planning Process

The critical aim of the investment planning process is to ensure that the suite of proposed investment projects has been exhaustively reappraised to ensure that investment is made in the most efficient manner possible to meet the overlapping drivers of growth, replacement, summer flexibility and environmental efficiency.

As chapter 4 explained, we have considered two main development scenarios for the NTS; a Pipeline scenario and an LNG Importation scenario. The two cases diverge in 2006/7 and, therefore, the projects identified in the early years of the plan are the same under each scenario.

## 5.3.2 Projects under construction

The projects listed in this section are set out in section 5.4 with their locations highlighted on the map of the NTS (Figure 5.4A).

| **Projects approved in December 2002** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Aberdeen to Lochside pipeline | 2004 | 50km x 1200mm | £50m |
| Wooler to Bishop Auckland uprating | 2004 | 145km, 75 to 85barg | £8.6m |

The projects listed above were approved for completion by October 2004, based on the output from the 2002 demand and supply forecasts. These investment decisions have been reviewed in light of the revised supply and demand forecasts issued in May 2003 and continue to be valid.

## 5.3.3 Projects approved for construction in 2005

| **Projects approved in January 2003** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Kings Lynn to Wisbech uprating | 2005 | 57km, 70 to 75barg | £9m |
| Wisbech to Huntingdon uprating (including Wisbech compressor station)* | 2005 | 67km, 75 to 85barg | £13m |

**Project Under review*

The projects listed above have been re-phased from 2003 delivery on the basis of later delivery of additional volumes through the Continental Interconnector associated with new compression at Zeebrugge.

### 5.3.4 Projects under consideration for construction in 2006 and 2007

| **Projects required for additional entry capacity from Easington/Aldbrough** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Ganstead to Rawcliffe pipeline | 2006 | 50km x 1200mm | £40.1m |
| Bishop Auckland Compressor Station | 2006 | Uprate to 85barg | £2.9m |
| Bishop Auckland Multijunction | 2006 | FCV + Mods | £3.0m |

| **Projects required for additional entry capacity from Milford Haven** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Milford Haven to Aberdulais pipeline | 2006/7 | 128km x 1200mm | £120m |
| Aberdulais to Gilwern pipeline | 2007/8 | 58km x 1200mm | £47.4m |
| Aberdulais AGI | 2006/7 | FCV | £1.0m |
| Gilwern AGI | 2007/8 | FCV + New Valve | £1.0m |

| **Projects required for additional entry capacity from Bacton** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Kings Lynn to Wisbech pipeline | 2006 | 30km x 1200mm | £28.8m |
| Kings Lynn Compressor Modifications | 2006 | High Flow Mods | £3.0m |

| **Projects required for additional entry capacity from St. Fergus** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Kirriemuir Compressor Modifications | 2006 | High Flow Mods | £1.0m |

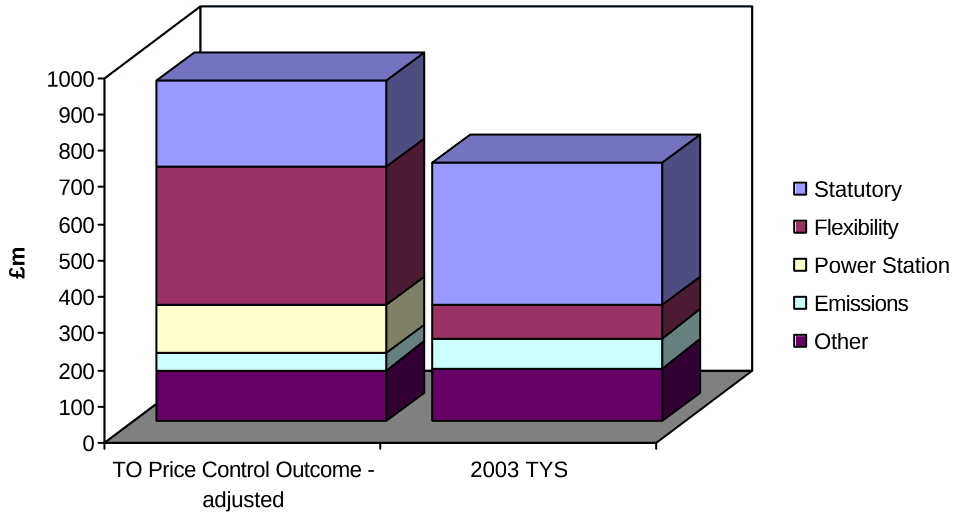
| **Projects facilitating additional entry capacity from more than one Terminal** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Pannal to Nether Kellet pipeline | 2007 | 90km x 1200mm Dia. | £72.1m |
| Peterborough Compressor Modifications | 2007 | High Flow Mods | £1.0m |

| **Projects facilitating exit capacity** | | | |
|---|---|---|---|
| **Project** | **Build** | **Scope** | **Cost** |
| Lockerley Compressor Modifications | 2007 | High Flow Mods | £2.4m |

### 5.3.5 Investment in Present Price Control Period

Figure 5.3A indicates the expected level of total investment in the present price control period (2002/3-2006/7) under the NTS Transmission Owner (TO) price control, split by the investment category for indicative purposes. In practice, many of the planned investments will meet more than one driver to a greater or lesser extent.

FIGURE 5.3A - Forecast Spend by Investment Category2002/3 to 2006/7 (2002 Real Prices)




*Note: 'Power Station' investment was partially excluded from the NTS TO Price Control (being enabled by the new SO incentive mechanisms). The TO Price Control outcome has been adjusted to include power station investment.*

*The above '2003 TYS' does not include Milford Haven Entry Investment for 2006/07 since no auction signal has been received to date.*

In the above Figure, 'Statutory' relates to growth investment consistent with the obligations placed on Transco under its Gas Transporters' licence to meet the 1 in 20 peak day criterion. 'Flexibility' refers to the investment required to increase the capacity of the NTS in the summer period to be closer to that experienced in the winter. 'Power Station' investment accounts for the large one-off connections to the NTS. 'Emissions' is the investment forecast to comply with new environmental legislation to reduce pollutants. 'Other' investment includes asset enhancement and the replacement of assets that have reached the end of their economic life.

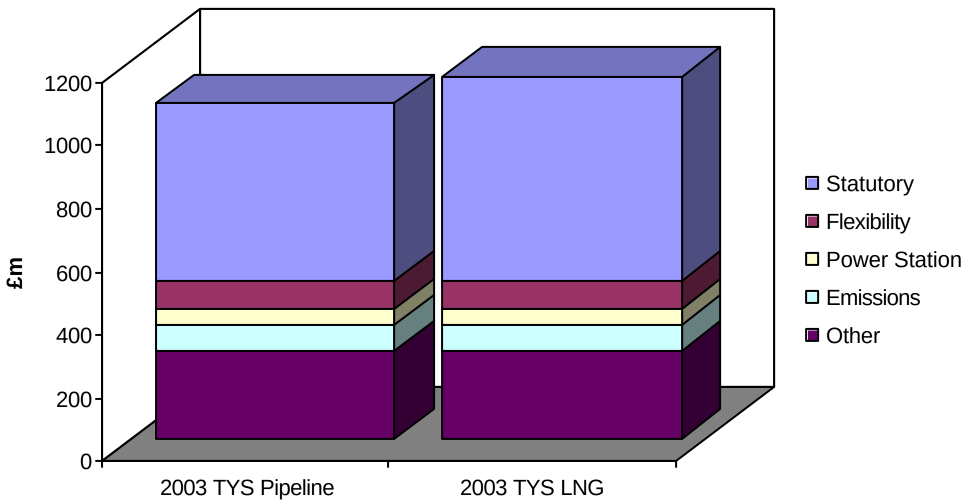
The projected level of investment, as shown in Figure 5.3A, is now lower than when the price control was set. The main reasons for this are the slippage in the connection of new power generation projects beyond 2006/7 and reduced summer flexibility investment. Ofgem's assumption when proposing the maximum revenue allowance reflected in our NTS price control, was that around £400m of investment would be undertaken to provide an ability to transport volumes of gas in the summer closer to those transported in the winter, subject to the market indicating, via the auctions, it valued this investment. The results of the auctions, detailed by the graphs in section 5.2, show considerable seasonality with low levels of bookings in the summer. Consequently, in light of this market signal, levels of NTS investment to provide summer flexibility will be lower than those envisaged when the price control allowances were set in 2001.

### 5.3.6 Analysis of Investment Scenarios

The difference between the Pipeline and LNG Importation scenarios is a mixture of the location of new gas imports from 2006/7 onwards and the phasing and final volumes of these new imports. The network impact of these two scenarios is illustrated in Figure 5.3B, which shows the expected levels of investment in the NTS under these two cases. Again, for indicative purposes, these investment levels are split between the main investment driver categories. To put our investment scenarios in the context of major upstream projects, the investment required to develop the Norwegian Ormen Lange field is forecast to be around £5.6bn, and it is expected that the proposed Gazprom pipeline from Siberia to Western Europe would cost around £3.7bn.

The average spend on the NTS over the forthcoming ten year period is forecast to be in the range £100m to £120m per annum.

FIGURE 5.3B – Forecast Spend by Investment Category 2003/4 to 2012/13 (2002 Real Prices)




### 5.3.7 Network Resilience

In recent years we have highlighted the potential for certain NTS investment projects to provide greater network resilience in the event of supply-side failures. No 'resilience' expenditure is included within the investment figures shown in Figures 5.3A and 5.3B. However, we have received some positive feedback on the possibility of such investment, and we are in the process of updating our previous analysis in this area to reflect our latest plans and their impact on the NTS going forward.

## 5.4 NTS Project List & Map

### NTS Projects Completed in 2003

A. Bacton to Kings Lynn pipeline (65km x 1200mm)

B. Chalgrove to East Ilsley pipeline (25km x 900mm)

C. Kings Lynn Compressor Additional Power

D. Bathgate Compressor Station – new units (commissioning may continue into 2004)

E. Aberdeen to Wooler uprating (80 to 84barg)

### 2004 Construction Approved Projects/Projects

F. Longtown to Lupton pipeline uprating (70 to 85barg)

G. Aberdeen to Lochside pipeline (50km x 1200mm)

H. Wooler to Bishop Auckland pipeline uprating (75 to 85barg)

### 2005 Construction Approved Projects

I. Kings Lynn to Wisbech pipeline & Kings Lynn Compressor uprating (70 to 75barg)

J. Wisbech to Huntingdon pipeline & Wisbech Compressor uprating (75 to 85barg) (under review)

### Construction Projects Under Consideration for 2006 and 2007.

K. Milford Haven to Aberdulais pipeline & Aberdulais Flow Control Valve (FCV)

L. Aberdulais to Gilwern pipeline & Gilwern FCV

M. Peterborough Compressor Modifications

N. Lockerley Compressor Modifications

O. Kings Lynn to Wisbech Pipeline

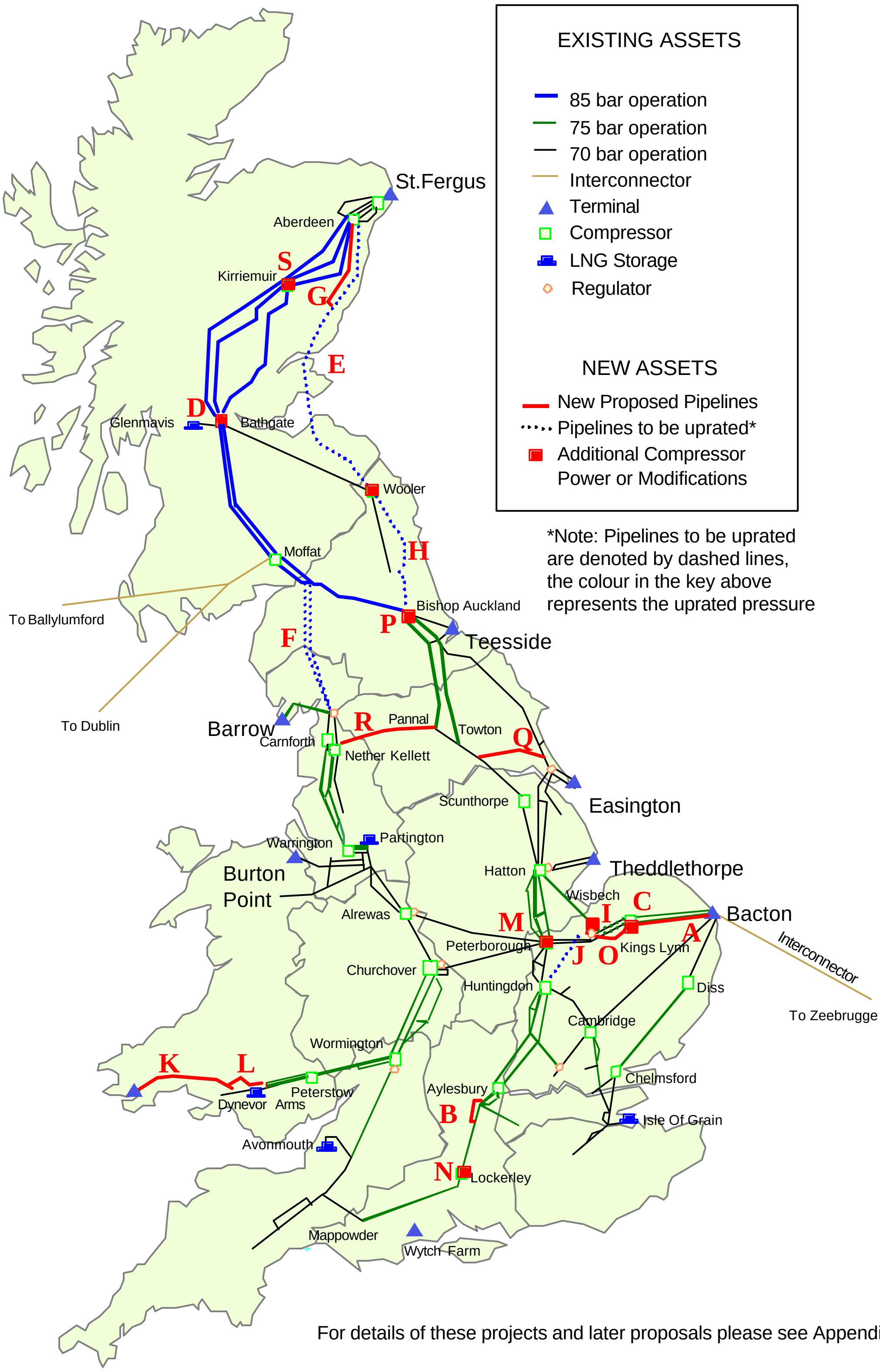
P. Bishop Auckland Compressor 85barg Modifications & FCV

Q. Ganstead to Rawcliffe pipeline

R. Pannal to Nether Kellet pipeline

S. Kirriemuir Compressor Modifications

FIGURE 5.4A - NTS Projects Completed, Approved & Under Consideration




For details of these projects and later proposals please see Appendix 4.

# Chapter Six

## Investment in UK Distribution

### 6.1 Transportation System

Following the creation of National Grid Transco plc in 2002, separate business units have been established for UK transmission and distribution activities.

UK Distribution manages the operation and maintenance of the local transmission systems (LTS) and below 7barg distribution systems. Organisationally, this is achieved through eight Distribution Networks (DNs), supported by a national Emergency Services organisation. For the purposes of this document all the DN demand data and investment plans are shown assuming the “status quo” i.e. all network plans have been developed by Transco.

We have indicated that the sale of one or more DNs is being considered. We remain committed to gas distribution as a core business of the Group and to remaining the leading gas distributor in the UK market. We will only sell networks if it creates value for shareholders and customers alike. The process that has commenced will involve consents from the Gas and Electricity Markets Authority and the Secretary of State and acceptance of revisions to our Safety Case by the Health & Safety Executive (HSE). The latest information relating to this area can be found on our website www.ngtgroup.com or on the Ofgem website www.ofgem.gov.uk.

Gas connection services are provided on behalf of Transco by Fulcrum Connections who operate as a separate subsidiary outside of the regulatory ring-fence.

### 6.2 LTS Development Plan

The LTS is designed for transmission and storage on the basis of ensuring maintenance of the 1 in 20 peak day criterion. The system is developed, based on demand and supply forecasts, to ensure that this capability is maintained. LTS projects tend to be numerous and of lower value than NTS projects. Major LTS pipeline projects (greater than £1 million) that have been approved to date and impact on 2003/04 and 2004/05 are shown in the following tables.

The workload and cost figures shown are the totals for each project. Part of the work may already have been completed in earlier years and the projects may also have an impact on future years, i.e. this is not necessarily the year of commissioning.

### 6.2.1 2003/04 Approved Projects

| Network | Project Name | Diameter (mm) | Total Project Workload (km) | Total Project Cost (£m) |
|---|---|---|---|---|
| Scotland | Onthank - Crosshouse 19bar | 450/250 | 10 | 4 |
| North of England | West Hull Reinforcement | 1050 | 18 | 18 |
| | Darlington Reinforcement | 300 | 4 | 2 |
| | Cowpen Bewley to Warden Law | 300 | 30 | 13 |
| North West | Samlesbury to Helmshore Reinforcement | 1050 | 29 | 46 |
| West Midlands | Lower Quinton to Kings Coughton | 1220 | 18 | 21 |
| | Barlaston to Milwich | 900 | 10 | 3 |
| Wales & the West | Gilwern to Hafodyrynys | 600 | 25 | 26 |
| | Caersws to Machynlleth Pipeline (Phase 2) | 200 | 24 | 7 |
| | St Davids | 150 | 10 | 3 |
| | Overton to Chirk | 150 | 9 | 2 |

### 6.2.2 2004/05 Approved Projects

| Network | Project Name | Diameter (mm) | Total project Workload (km) | Total Project Cost (£m) |
|---|---|---|---|---|
| Scotland | Bathgate to Carfin | 1200/450 | 20 | 39 |

*NOTE: Remaining projects are smaller and cost less than £1m.*

Appendix 4 provides schematic diagrams of the LTS networks and is intended to give an indication of the extent of the networks within each LDZ. Networks operating below 7barg are not shown.

## 6.3 Below 7barg Distribution System

The Transco below 7barg network is constrained to operate between levels of pressure defined by statute, regulation and safe working practices.

We continue to develop our below 7barg distribution system, investing in mains, services and associated plant and machinery to meet both the needs of providing capacity to customers wishing to connect to our network and other Gas Transporters' requests for transportation services.

The distribution systems are designed and reinforced to meet a peak six-minute (pk6) demand level, which is the maximum demand level (averaged over a six minute period) that can be experienced in a network under cold winter conditions.

We will continue to invest in capital on reinforcement and new connections consistent with the growth in peak day demand forecast in this document.

The volume of connections for the total market is forecast to be as follows:

FIGURE: 6.3A - Total Market Connections

| **Total Market** | **2003/04** | **2004/05** | **2005/06** | **2006/07** | **2007/08** | **2008/09** |
|---|---|---|---|---|---|---|
| Existing Housing | 93,700 | 92,700 | 91,700 | 90,700 | 89,700 | 88,700 |
| New Housing | 152,100 | 152,800 | 153,800 | 155,300 | 155,700 | 155,900 |

We also continue to invest in new and replacement meters and in the replacement of our transportation network assets, primarily for the renewal of mains and services within distribution systems. This includes expenditure associated with the Enforcement Policy initiated by the HSE for decommissioning all iron gas mains within 30 metres of buildings within a 30-year period. Ofgem has agreed funding arrangements for the first 5 years of the programme.

# Chapter Seven

## Commercial Developments

### 7.1 Introduction

The major areas of commercial development that are planned for completion in 2004 are expected to be:

- Consideration of commercial issues surrounding the potential sale of Distribution Networks (DNs)
- Reform of exit capacity regime, in particular interruption arrangements.

During 2003 considerable time has been devoted to the development of new processes to better enable shippers to obtain entry capacity at new entry points. This process, known as an extended auction, may be used in the spring of 2004 to facilitate bids for capacity at a number of prospective new entry points including Garton, Barton Stacey and Milford Haven.

Issues associated with potential network sales, exit reform and new entry points are discussed in more detail later in this chapter.

The modifications made to our Gas Transporters' Licence in September 2002 outlined the form and duration of the System Operator (SO) incentives, which applied from 1st April 2002. Whilst some parameters of the schemes were set for the full duration of the Transmission Owner (TO) price control (from 1st April 2002 until 31st March 2007), others were set for a shorter period with a view to reviewing them prior to a planned implementation of revised arrangements on 1st April 2004.

The following table shows the list of parameters that Ofgem has indicated will be reviewed in the context of each incentive:

| Parameter | Sharing Factors | Target | Caps & Collars |
|---|---|---|---|
| Entry Capacity Buy-Back | ✓ | ✓ | ✓ |
| System Reserve | ✓ | ✓ | ✓ |
| SO Gas Cost | ✓ | | ✓ |
| Exit Capacity | ✓ | | ✓ |
| Internal Cost | ✓ | | |

In addition, there will be changes to the LDZ transportation activity revenue restriction. The purpose of these licence modifications is to formally split the combined LDZ transportation activity revenue between the DNs.

### 7.2 Potential Sale of Distribution Networks

In order to be able to sell a DN business, we will be required to obtain the consent of the Gas and Electricity Markets Authority and the Secretary of State under the Gas Act and the conditions of our Gas Transporters' Licence. The sale of a DN business will require a number of aspects of the commercial regime to be reviewed and possibly modified ahead of any sale to ensure that a robust commercial environment will continue to apply after any sale. The latest information relating to this area can be found on our website www.ngtgroup.com or on the Ofgem website www.ofgem.gov.uk.

### 7.2.1 Safety Case

A separate safety case will be required for each independent DN. Transco's safety case will require revision and each of the new and amended safety cases will require acceptance by the HSE.

We have agreed a programme of work with the HSE in order to deliver these changes within the proposed timetable.

## 7.3 Exit Reform

Consultation with industry participants through Network Code workstreams has been ongoing through most of 2003. Broadly, discussions have considered whether the present regime unduly discriminates in favour of or against some interruptible customers, and whether more choice of interruptible product should be available to shippers and consumers. Included in questions of choice is consideration of how much potential interruption we might wish to contract for in order to ensure access to an efficient level of demand management. Discussions have progressed on the basis of the following proposals:

- Firm-only transportation on the NTS, supported by arrangements with power stations, interconnectors and other directly connected customers for demand management.
- Firm, as well as an expanded range of interruptible transportation arrangements, in the DNs, all supported by administered charges.
- Development of operator-to-operator agreements to enable DN SOs to provide interruption services to the NTS SO and/or the ability for DN shippers/consumers to provide demand management services direct to the NTS SO.
- Development of an ability for DN SOs to manage the quantity of interruption rights that it may choose to release.
- Development of DN demand management arrangements on a non-administered basis.

## 7.4 New Entry points

During 2003 there has been considerable discussion about how best to facilitate the connection of new entry points to the NTS. One particularly important contributing factor to an efficient outcome would be the efficient sizing of onshore infrastructure to meet entry capacity demand. We would wish to facilitate such an outcome, which is in the interests of both the wider community and specifically developers of infrastructure upstream of potential new entry points and shippers who might wish to use incremental entry capacity. Efficient outcomes may be challenging to deliver in instances where there are multiple developments planned for a new Aggregate System Entry Point, particularly where respective timescales do not enable information to be aggregated into a clear investment signal at a single point in time. This is most apparently the case with the established LTSEC auctions, whereby bids resulting from a single auction process are taken to provide evidence of capacity requirements.

During 2003 we have proposed, and Ofgem has subsequently directed us to implement, a Network Code Modification Proposal (Modification Proposal 0638 “Extended LTSEC Auctions at New Entry Points”) where it may be possible to establish a clearer signal of future capacity requirements in cases where infrastructure investment projects are envisaged but which have different anticipated start-up dates. Information can then be aggregated over a longer bidding period so that efficient investment can be made to underpin whatever capacity allocation arises. An extended auction may allow economies of scale to be realised by all Users who bid into it. Users will also have the opportunity to secure capacity at an initial (early) stage and a later final stage.