Gas: Liberalised Markets and Security of Supply

Report with Evidence

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Relevant Previous House of Lords reports on Gas

- Energy Supply—How secure are we?, 14th Report 2001-02, HL Paper 82
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(Q) refers to a question in oral evidence
(p) refers to a page of written evidence
ABSTRACT
The European Commission has introduced measures to liberalise the gas markets, the latest being a draft Regulation governing conditions for Third Party Access to transmission systems.

The European Union is already a major net importer of gas. By 2010 it is expected to be nearly 60 per cent dependent on imported gas; this dependency will increase to between 70 and 80 per cent by 2020.

The United Kingdom is moving rapidly from the position of net exporter of gas to net importer. By 2010 the United Kingdom will be importing around 50 per cent of its gas requirements. This is likely to rise to around 70 per cent in 2020.

This increasing dependency on imported gas as a major energy source has raised questions about the security of gas supply. In this report we consider that issue, in both the short and medium terms.

We regard the European Commission’s measures as overdue. It is important that the Government support them fully. The Commission may face resistance in some Member States; it is important that these measures be effectively implemented.

We conclude that adequate supplies of gas will be available to the European Union at least for the next 20 years and possibly beyond. Liberalisation of the European Union gas markets will reinforce security of supply.

However, gas prices are likely to rise significantly over this period. In the longer-term this may determine the balance of energy.

In the short-term, we are uneasy about the position in the United Kingdom over the next two to three winters where the supply and demand balance is already tight. The Minister sought to reassure the Committee, but we remain unconvinced. We note that Ofgem believes the supplies are adequate except in extreme conditions. It is the extreme conditions we worry about.

Over these winters, it is not clear that the market-based balancing of supply, from all available sources, against the highest daily demand peak in 20 years (National Grid Transco’s required statutory standard for gas transport) could be achieved without making over-optimistic assumptions about the practical scope for contractual interruptions and the adequacy of the demand-side response to high spot prices for gas.

We are unable to assess how resilient the United Kingdom gas supply system will be to other forms of interruption, such as damage to the physical transportation infrastructure.
CHAPTER 1: WHAT THIS REPORT IS ABOUT

1. Two significant factors relating to the European and global gas markets that will affect both producers and consumers over the next few years are:

   • the drive within the European Union towards a liberalised internal gas market; and
   
   • concern about security of supply (availability) as gas becomes an increasingly important source of energy and net imports into the European Union become substantial.

2. In this report we consider these factors and, where appropriate, the inter-relationship between the two.

Liberalisation in the Context of the Gas Market

3. What do we mean by liberalisation of gas markets? In the first place, we refer to the legislative process put in place by the European Union to create a single European market for electricity and gas. This legislative process distinguishes the two salient features of a gas market:

   • the ownership and control of, and the access to, the use of gas transmission and distribution infrastructure (pipelines) and to gas storage;
   
   • the shared use of such monopoly infrastructure by companies competing to supply gas under contract to households and businesses.

4. In some countries, particularly in parts of continental Europe, the same company fulfils both functions; these are generally vertically-integrated companies which occupy a position of market dominance and sometimes supply monopoly, particularly when the company is, in effect, a “national champion”. The thrust of European Union legislation is to separate these two functions,—it is known as unbundling—to ensure third party access to the gas transportation networks and storage, thus introducing and promoting competition in the supply of gas to customers.

5. The Second Gas Directive\(^1\) calls for the unbundling of transmission companies from supply companies. However, to ensure that new-entrant supply companies are able to compete, they need to have equal rights of access to the transmission network on fair and transparent terms. The draft Regulation\(^2\) is designed to achieve this.

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\(^1\) 2003/55/EC

\(^2\) Doc No.1 COM(2003) 741
A Global Market

6. The concept of a fully liberalised gas market within the European Union is important because, in principle, the tensions which arise between the fully liberalised markets and the historic, managed markets in Europe also arise between gas producing companies in non-European Union countries and gas supply companies. Full liberalisation of global gas markets is a matter of international agreement and of the power of market forces. In this respect, the increasing number of potential producers creates, through diversity of supply, the competitive element necessary for an international market in gas to evolve, the more so now that a substantial international trade in Liquefied Natural Gas is rapidly developing. We consider these issues in Chapter 2.

European Union Legislative Background

7. The Single European Act of 1985 set down common rules for the creation of an internal market. Article 7A (now 14) was added to the EC Treaty defining the internal market as “an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty.” The Community was required to adopt measures to establish an internal market by 31 December 1992. Although the establishment of an internal market in energy was included, this was one of the sectors which failed to meet this deadline.

The Electricity Directive


9. Work on the first internal market Gas Directive began in September 1996 and continued until the Directive was adopted in 1998. The Committee examined this Directive during the latter part of the negotiations and published a report4. This Directive encountered considerable opposition from the industry in parts of continental Europe.

The Lisbon Agenda: Liberalised Energy Markets

10. The Lisbon European Council in March 2000 urged rapid liberalisation of the electricity and gas sectors as part of the drive to complete the single market in goods and services and also to help improve European Union competitiveness in the global economy. The European Parliament, in a Resolution dated 6 July 2000, requested the Commission to adopt a detailed timetable to achieve a liberalised energy market. The Commission’s response was to propose the Second Gas Directive and the draft Regulation on conditions of third party access to the gas transmission systems

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3 1998/30/EC

11. The 1998 Directive failed to create the appropriate conditions for a liberalised market and little was done in many Member States to counter the market dominance of the large vertically-integrated companies. A new Directive\(^5\) was adopted in June 2003. This Directive set common rules for the transmission, distribution, storage, and supply of natural gas, and for market access. (A brief analysis of the Directive can be found in Appendix 4).

Draft Regulation on Conditions of Access to Gas Transmission Systems

12. In September 2003 the “Madrid Forum” published guidelines for good practice governing third party access to gas transportation networks. The Forum comprises the Commission, representatives of Member States, the national regulatory authorities, and the industry. The Commission has since embodied these guidelines in a draft Regulation that will make them compulsory practice in all Member States. This Regulation is currently the subject of consideration by the Council and the European Parliament.

Regulating the Market

13. The transmission system of arterial pipelines, and further downstream, the distribution networks, are for the most part natural monopolies. It is important to regulate the monopoly to ensure access for gas suppliers at fair tariffs and to persuade suppliers to invest in infrastructure. There is a difference in practice between the liberalised United Kingdom market and most markets in continental Europe. The Commission believes that there has been a “sea-change” in attitudes in Member States and the industry. We assess this judgment in Chapter 2.

Security of Supply—Availability

14. Gas is becoming an increasingly important source of energy for the European Union as well as for the United Kingdom. The European Union has been an importer for years but, according to the European Commission, the percentage of imports will rise from 45 per cent of current demand to 80 per cent of forecast demand by 2030\(^6\).

15. According to the Government, the United Kingdom will become, increasingly, a net importer of gas on an annual basis from around 2006\(^7\) and is expected to import 50 per cent of its gas requirements by 2010.

16. Against this background, we consider whether the European Union and the United Kingdom will be able to obtain gas supplies on the scale needed over the medium and long-term. We examine the evidence in Chapter 3.

Will a Liberalised Market Enhance or Diminish Security of Supply?

17. An important corollary to this increased need for gas is whether the full liberalisation of the European Union gas markets will help or hinder attracting the investment needed to maintain and increase the extraction and export infrastructure in external producing countries, and the additional

\(^5\) 2003/55/EC

\(^6\) Written evidence from the European Commission, p 42

\(^7\) Written evidence from the Department of Trade and Industry, p 52
European Union gas infrastructure needed to link the increasing flows of imported gas to consumers. Observers within the industry predict that the European Union will need to double its arterial gas transmission network over the next 15 years so as to handle demand growth and the increasing proportion of imported gas. We consider this in Chapter 3.

**Low Probability/High Impact Shocks**

18. In the case of the United Kingdom, there is already concern about meeting peak winter demand over the next two or three years. There is also the need to prepare for the risk posed by a very exceptional winter day that might occur once in 20 years. Whereas National Grid Transco is statutorily required to have sufficient transport capacity to meet the security standard of the highest daily demand peak in 20 years, it is not clear that the market-based balancing of supply, from all sources, against such a peak of demand could be achieved without making unrealistically optimistic assumptions about the scope, in practice, to exercise interruptible contracts and the sufficiency of the demand-side response to high prices in the spot market for gas. There is more recently the risk involved of possible terrorist threat to the physical security of the gas infrastructure. We consider these elements in Chapter 4.

**Conclusions and Recommendations**

19. Finally, in Chapter 5, we present our conclusions and recommendations. On availability of gas we conclude that:

- there will be ample supplies to 2015 and possibly to 2020-2025;
- global economic growth and increased global competition will be reflected in rising gas prices which, in turn, is likely to affect the relationship between gas and other forms of energy;
- there is uncertainty whether the United Kingdom will have sufficient resources to cover peak winter demand and/or a low probability/high impact shock in the period up to 2007; even when the new import schemes are operational, there is still a question whether a market-based, “just-in-time” system will provide insurance against such extreme circumstances;
- there will be uncertainty arising from uneven transposition of European Union legislation and from uneven implementation by 25 national regulators; this is likely if anything, to hinder investment decisions; and
- the implementation of European Union legislation will therefore require powerful political commitment by all parties.

8 There are two ways of measuring abnormal demand: the peak (winter) day that occurs once in 20 years; and a sustained peak winter period of equal severity to the one day in 20 years. This sustained peak period is known as the “one in 50 years” peak. The TSO is also statutorily obliged to ensure adequate supplies in this “once in 50 years” event.
Acknowledgement

20. We are grateful to all witnesses for their evidence, in particular for evidence from continental companies and organisations. We should like to thank the representatives of the European Commission and Ruhrgas who travelled to London to give oral evidence. We are also grateful to the Minister for Energy and to the Department of Trade and Industry for their evidence. Finally, we should like to thank our Specialist Adviser, Mr John Wybrew, for his wise counsel and help throughout the inquiry and in the drafting of this report.
CHAPTER 2: LIBERALISATION OF THE EUROPEAN UNION GAS MARKET

The Need for a Liberalised European Union Gas Market

21. The United Kingdom Government believes that real security of supply for gas comes from the workings of a fully liberalised market for gas. This is a view strongly shared by the European Commission and, according to the Commission (Q 185), also supported, to a greater or lesser extent, by most Member States.

The Two Models

22. In simple terms, there are currently two models of how the market operates: the United Kingdom model based on “common carriage” which recognises the natural monopoly of a gas transportation system but opens the use of that system on a non-discriminatory basis to all-comers under close regulation; and the system which predominates in parts of continental Europe, which is perhaps best described as a managed market built on a web of bilateral agreements between producing companies (eg in Russia and Algeria) and European Union supply companies on the basis of long-term take-or-pay contracts (See Box 1)(Q 28); and, moreover, a system of “contract carriage”, under which individual network users must contract for capacity and for the carriage of each quantity of gas from one point to another.

The United Kingdom Model

23. The essential elements of the United Kingdom model, which can be found to a certain extent in Scandinavia, the Netherlands and in southern Europe—outstandingly in Spain—envisage a freely open and competitive market on the basis of a single transmission systems operator (TSO) closely controlled by the Regulator (Ofgem). The TSO is independent of the suppliers. The network code which governs the use of the monopoly transportation network requires a transparency of information and consultation with the network users and non-discriminatory access and tariffs. This means, in practice, that any supply company can enter the United Kingdom market provided it secures a customer base and observes the rules of the shared network agreed by the United Kingdom Regulator. The advantages of the United Kingdom model are that it readily facilitates competition and choice for the benefit of consumers, it is effective in fully utilising the infrastructure assets; it is efficient and it is flexible. But it also tends to be run on a basis of “just in time”. To do otherwise would not be commercially attractive.

24. No comparable markets have been able to match the United Kingdom’s record of bringing competition and choice to over 20 million households, making the United Kingdom Europe’s biggest gas market. Arguably, the circumstances which led to this beneficial outcome were uniquely favourable. The British gas market was self-contained and had ample self-sufficiency by virtue of the developed off-shore gas resources. Supply competition created up-stream competition between the producers operating from the United

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9 Written evidence from the Department of Trade and Industry, p 53
10 Written evidence from the European Commission, p 42
Kingdom Continental Shelf (UKCS)\(^{11}\), driving down consumer prices. At the same time, competition boosted the “dash for gas” into efficient, new gas-fired electricity generating power stations. This, in turn, intensified competition in the power-generating market where, following the introduction of the New Electricity Trading Arrangements, wholesale prices fell by 40 per cent. Bottlenecks at terminals, where gas enters the arterial transmission network, are tackled though a series of capacity auctions, signals from which are used to inform the planning for future network capacity.

**The Continental Market Model**

25. The model that has prevailed in continental Europe has been that of a gradual build-up of long-term—20 to 30 year—contracts between producers and suppliers, which themselves were part of vertically-integrated companies, and which therefore controlled their own separate transmission systems.

26. Entry into this market was difficult. It involved what the Ruhrgas witness, Mr Pfaff, described as, “commitment”—in other words—participative investment (Q 145). These markets are organised in “balancing zones” which are designed to sustain the operational integrity of the network. The gas markets in parts of continental Europe are also divided into “H.gas” (ie high calorific) and “L.gas” (low calorific) zones. The presence of these balancing zones make access to and transit across the continental system difficult, if not often impossible (Q 66). The essence of this system, according to the witness, was that the “grid was constructed on the basis of existing volumes in the market . . . . so it was more or less tailor-made for the volumes which are serving the market.” Entry into the market, although in theory unimpeded, nevertheless required commitment. “I would say it is not possible to get access to our grid if you are looking, for example, to transit addition volumes from, let us say, the Netherlands to Italy if you do not give long-term commitment.” (Q 145)

27. On the other hand, Mr Pfaff argued that if a customer in the German market wished to change, say, to a United Kingdom supplier, then the capacity committed for the German customer could be made available to the new supplier. However, he was also quite firm that unless incoming suppliers invested in the transmission network, use of the system to convey their gas would, necessarily, be “interruptible”, that is to say, it would depend on the availability of uncommitted capacity of the pipeline system on the day.

28. The other element missing from the managed market in some Member States has been the presence of a dedicated national Regulator as distinct from the general competition authorities. Under the European Union’s First Gas Directive\(^ {12}\) the choice was left to Member States either to have regulated or negotiated third party access—“Germany chose negotiated third party access and by that there was no need for a Regulator.” (Q 147). The Second Gas Directive, adopted in 2003, removes this choice and Germany, like all other European Union Member States, is in the process of appointing a national Regulator who has to be in place by 1 July 2004 (Q 147).

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\(^{11}\) *European Report* No.2865, 1 May, 2004, p III.7

\(^{12}\) 98/30/EC
GAS TAKE-OR-PAY CONTRACTS

Long-term take-or-pay contracts between gas producers on the one hand, and suppliers delivering to consumers on the other, have been a central feature of the regime of monopoly supply and managed markets on which the EU gas industries have been successfully developed.

Unlike oil, which can readily be stored and transported to any destination, gas is difficult and costly to store and transport. The infrastructure linking the source of gas to its market(s) is capital intensive and essentially fixed. Even Liquefied Natural Gas (LNG) schemes have until recently comprised a regular ‘liner trade’ between the source of gas and one or more regasification terminals feeding delivery networks.

The Continental Experience

Tied to one or few market outlets, gas producers faced uncertainties over future gas prices and also over the volumes of gas which the market(s) in question could accommodate, when considering the development of additional production/transportation capacity. Without open access to consumers and well-established, liquid, trading markets, it would not have been possible to manage the commercial risks and to justify the investment.

In the particular case of gas, the long-term take-or-pay contracts between producers and integrated monopoly companies overcame this problem, representing a mutually-beneficial marriage of interests.

The Take-or-Pay Contract

The producer commits to the long-term supply of gas, with defined minimum volumes and a price formula, and is thereby assured of a secure income flow subject to the technical and operational performance of the gas field and its related transportation arrangements.

The supplier commits to taking and paying for the defined minimum volumes, thereby procuring an assured supply of gas at predictable prices to include in its portfolio of supply contracts built up to cover the foreseen growth of market demand.

The United Kingdom Experience

From the late 1960s, British Gas was able to use its monopoly of the steadily growing British market to underwrite the development of new offshore gas fields and the related infrastructure, the production from which was dedicated to British Gas’s supply portfolio.

This worked well until the mid 1990s by which time the progressive introduction of supply competition meant that British Gas was faced with multi-billion pound future take-or-pay obligations which were misaligned with its declining market share. At considerable cost, British Gas was forced to re-negotiate or buy out much of its portfolio of take-or-pay contracts.

This and other factors triggered the splitting of British Gas, early in 1997, into Centrica, the supply business, from BG, the monopoly infrastructure provider (as Transco) and the international gas business. Centrica is again concluding long-term supply contracts, for example, with Statoil and GasUnie, but this time with sufficient flexibility on price, or volume, or both, to avoid becoming stranded with uneconomic contractual liabilities.

Prices

29. Mr Pfaff defended relatively high prices in continental Europe on the grounds that security of supply required the long-term and continued commitment of the major producers, notably Russia and Algeria, and that the return had therefore to be sufficiently high to encourage those producers
to undertake investment in the provision of gas to the European market (Q 169). This was a position supported by other witnesses, notably Ente Nazionale Idrocarburi (ENI). Mr Pfaff also argued that there was an effective ceiling on gas prices, particularly in Germany, brought about by the competition of other energy sources for power generation, notably coal. When, in the aftermath of the Iranian revolution in 1979, oil prices had risen, gas prices, which in Europe were indexed against oil prices, had also risen. “The decision was made to build new power stations based on hard coal in Germany, and then you have lost these customers for at least the lifetime of the stations” (Q 170). The Committee did not examine the effect that European Union emissions regulations might have on this proposition.

The New European Union Legislation for Liberalised Gas Markets in Europe

30. In a Memorandum13 accompanying the consultative draft Directives issued in 1991, the Commission reviewed the obstacles to the creation of a single market in the gas and electricity sectors, listing them as follows:

- established gas undertakings had exclusive rights which limited new entrants to the market;
- there was little or no gas-on-gas competition because the few importers there were had divided the markets between them “through a series of long-term contracts characterised by costly take-or-pay clauses and supply prices based on the price of competing fuel.”;
- consumers were unable to choose their suppliers;
- integrated gas and electricity companies published their accounts on a consolidated basis which limited information given to the public;
- interventions by Member States in the gas and electricity markets were often excessive and hindered companies’ adjustment to their commercial environment;
- conditions in which companies operated were not harmonised; and
- gas and electricity transmission infrastructures and interconnections between networks were often inadequate and consequently restricted justified economic exchanges.

The First Gas Directive

31. The First Gas Directive made an attempt to address some of these difficulties. It was perhaps unrealistic to expect that a system that had built up over 40 years in continental Europe could be changed so radically and so quickly. A major concern to the companies was the existence of long-term take-or-pay contracts which, with the introduction of a more open market, could have left them with high cost gas on their hands. The Commission also offered a choice of regulation or negotiated agreement. Not unsurprisingly few opted initially for regulation though this has been an increasing trend since. Perhaps, most important of all, was that the separation between the transmission systems companies and supply companies was only on the basis of companies’ accounts. Our Committee, in its report, had called for at least

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the establishment of effective Chinese Walls in order to prise open the system and make access realistic.\textsuperscript{14}

**The Second Gas Directive**

32. In the Explanatory Memorandum which accompanied the Second Directive\textsuperscript{15}, the Commission identified what it described as “quantitative” and “qualitative” elements for the creation of a real, and effective, internal market for electricity and gas.

33. The “quantitative” proposal was that there should be progressive freeing of all electricity and gas consumers to choose their supplier. This would ensure that all European Union companies received the benefits of competition in terms of increased efficiency and lower prices. It would ensure that European Union consumers received the full benefits of market opening in terms of lower domestic bills and it would ensure a level playing field between Member States in terms of market opening and, hence, lead to the integration of the 15 national markets into one fully operational single market.

34. The “qualitative” proposals called for the improvement of the structure of the markets: “Experience in market opening, not only in the Community but also in other countries, has clearly demonstrated that certain approaches to market opening are far more likely to bring about the development of effective competition. The clear majority of Member States have adopted such an approach for electricity and a large number of Member States have also done so for gas.”\textsuperscript{16} Appendix 4 contains a brief analysis of the main elements of this Directive.


35. The European Union’s Second Gas Directive requires Member States to provide for free choice of supplier for all non-household customers from July 2004 and for all customers not later than July 2007, on the basis of regulated access to the networks. In order to ensure that regulated access to the networks brings about the results and meets the objectives laid down in the Second Gas Directive, problems relating to access will be dealt with in the framework of the EU Gas Regulatory Forum (the so-called “Madrid Forum”) which, under the chairmanship of the Commission and with the active participation of national Regulators, the European gas industry network users, and the Member States, discusses and refines the detailed rules complementing the legislative framework set by the Directive. When this Forum met in September 2003, all stakeholders agreed on a set of voluntary guidelines governing the minimum standards to be guaranteed for conditions on access to the network.

\textsuperscript{15} 2003/55/EC
\textsuperscript{16} Explanatory Memorandum COM(2001) 1215 Final, page 3, paragraph 2
**Draft Regulation on Third Party Access**

36. In the light of this experience the Commission proposed in December 2003 to turn these voluntary guidelines into binding rules by means of a Regulation governing conditions for access to the transmission network. This proposed Regulation is currently being discussed by the Council and the European Parliament. An important omission in the negotiating text appears to be the absence of enforceable guidelines on access to storage. The implementation of the Regulation will be through the process of comitology and one witness has called for the formal involvement of the industry with this process. An attempt to resile from the voluntary guidelines drawn up by the Madrid Forum, would render the Regulation less effective and not help the convergence of market practice throughout the European Union gas market.

37. Commission witnesses described the Second Gas Directive as a “real sea change” (Q 186). For the first time it will require legal unbundling of the transmission network from all other competitive activities—an important distinction from the situation in the First Gas Directive which only stipulated separate company accounts. Legal unbundling will entail the creation of fully transparent and free-standing subsidiary companies but these may remain in the same group (Q 251). The Second Gas Directive will require published prices for access to the network which have to be applied to vertically-integrated companies’ subsidiary companies, as well as to others. Because prices have to be published, they cannot be discounted. There must also be an energy-specific Regulator. We note with some concern that the proposed new German Regulator will not be energy-specific but will also have responsibility for telecommunications (Q 220).

**Physical and Contractual Congestion in the European Pipeline System**

38. The Commission argued that there was adequate physical capacity in Europe in the gas pipelines but that a lot of it was subject to long-term capacity reservation agreements. The Commission’s response was to introduce a “use-or-lose-it” clause into the Regulation. If most pipelines were contractually congested, but the capacity was not being fully used, then that capacity had to be made available. This was now embodied in the proposed Regulation on Third Party Access (Q 186).

39. Commission witnesses did not think that there would need to be a single European Union-wide Regulator. The role for the European Union lay in benchmarking, promoting the interoperability of networks, and spreading

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17 Written evidence from the European Commission, p 44
18 Comitology is the name given to the way in which the European Community implements secondary legislation by committees, chaired by the Commission, on which Member States are represented at official level.
19 Gastransport Services’ written evidence, p 100, para 13
21 *EU Gas Directive*, 7th Report, Session 1997-1998, HL Paper 35, paragraph 104 and 2003/55/EC Article 9(1); “Where the transmission system operator is part of a vertically integrated undertaking, it shall be independent at least in terms of its legal form, organisation and decision making from other activities not relating to transmission. These rules shall not create an obligation to separate the ownership of assets of the transmission system from the vertically integrated undertaking.” See also Article 13.
best practice to ensure that the market system produced a return on investment. “We are determined there is going to be a level playing field. If necessary we will begin infringement proceedings immediately in July, August or September where Member States fail to fully implement the Directives.” (Q 186) The Commission also promises to review the situation in 2006 if this proves necessary. **We recommend that the Government urge the Commission to carry out such a review in 2006 in order to promote rapid and common implementation of the Directive.**

**Major Weaknesses in the Existing Continental Markets—a United Kingdom View**

40. The Department of Trade and Industry argued that in spite of the considerable progress that had already been made, there was still a long way to go before the European Union became a genuine single European energy market. The Department listed the European Union market’s central weaknesses as: a lack of a trading environment in gas where consumers were not yet all able to change their supplier; and the lack of a competitive environment in gas. Although the legislation was designed to address the structure of the market, the issue of market power remained and this was exacerbated by the state of the gas and electricity markets in the European Union which provided scope for dominant players to trade in gas outside normal commercial constraints. There was a need to provide the right regulatory framework and financial incentives to improve the links between Spain and France, and the distribution system in Poland. Interoperability could be constrained by the absence of a clear European Union approach to gas quality specifications which, in turn, could act as a brake on the development of gas trading hubs. Finally, there was not yet a coherent framework for facilitating gas imports from a variety of sources, by a variety of routes, in the European Union. These views were also reflected in the evidence given by the Centrica witnesses (Q 96).

**Importance of Political Commitment by European Governments and Industry**

41. The Minister for Energy told us: “from our point of view the biggest issue that needs to be resolved satisfactorily is the gas market structure in Europe.” (Q 230). He commended the Commission’s legislative proposals but added that these needed to be supported by genuine conviction on the part of governments and industry players across Europe. This was a point also made by Centrica witnesses (Q 110) and by Professor Peter Davies of BP (Q 71 and Q 77). Mr Eggar, the former Minister for Energy, however, supported the Commission view that there was now a genuine desire for change in Europe in the direction of greater liberalisation. “I think we have reached what I call the tipping-point. In other words, I think that the major incumbents have now accepted that liberalisation is coming and therefore are debating it in that context, as opposed to trying to find all sorts of ways to stop it happening or to delay it happening.” (Q 308).

42. **We welcome the action that the European Commission has taken in introducing the Second Gas Directive and in proposing a Regulation governing Third Party Access.**

43. **Member States should be discouraged from protecting national energy champions when the thrust of European Union legislation is to**
create a common, pan-European market in gas. Economic forces are moving in the direction of global markets for gas and the European Union’s Lisbon Agenda seeks competitive energy markets to help the global competitiveness of the European Union economy.

44. We are also concerned that Member State Regulators have to strike the right balance to sustain major investment decisions that may well have an effect on other Member States. For example, a major infrastructure decision in the centre of the European landmass will undoubtedly affect the energy policies of adjacent Member States. We see it as the Commission’s role to encourage a commonality of approach by the individual Member State Regulators.

45. We recommend that the Government support the European Commission in its promotion of full liberalisation of the energy markets, and especially the gas markets.

46. We urge the Government to be supportive of the Commission in its oversight and monitoring of the implementation of the Second Directive and the proposed Regulation.

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22 A recommendation made in our report “Energy Supply: How secure are we?”, 14th Report, 2001-02, HL Paper 82, paragraphs 39-40
CHAPTER 3: AVAILABILITY AND SECURITY OF SUPPLY

47. “Gas is a fuel with great potential; it offers many competitive advantages including abundance, cleanliness and flexibility. It has the potential to become the most important fuel for the next generation. However, there are considerable challenges in building the markets for gas and the systems to deliver it over increasing distances to those markets.

48. The physical existence of gas is not a limiting factor. The global gas reserve is 50 per cent higher than oil, at some 60 years of current demand [See Box 2]. Gas resources have been much less explored than oil and much of the world’s reserves were found by organisations drilling [primarily] for oil. There will be significant growth in liquefied natural gas as costs fall. This will result in an increasingly global gas market with some growth in [market] liquidity.”

**BOX 2**

**The Definition of Reserves**

Estimates of the reserves of oil and gas which can ultimately be produced from discovered fields are inherently uncertain. They are based on information progressively built-up initially from the exploration and appraisal wells, and then from the development and operation of the field over time. Complex modelling techniques are used to interpret such information.

To describe the range of uncertainty for reserves estimates, the terms “proven”, “probable” and “possible” are used. These categories of reserves estimates are defined as follows:

- **“proven” reserves**: those reserves which, on the available evidence, are virtually certain to be technically and economically producible (ie having a better than 90 per cent chance of success);
- **“probable” reserves**: those additional reserves which are not yet proven but which are estimated to have a better than 50 per cent chance of being technically and economically producible;
- **“possible” reserves**: those further reserves which at present cannot be regarded as ‘probable’ but which are estimated to have a significant but less than 50 per cent chance of being technically and economically producible.

For supply planning purposes the combination of “proven” and “probable” reserves are generally used, with the “possible” reserves category perhaps being used as an upward sensitivity. Thus, the reserves figures used in BP’s Statistical Review are “proven” plus “probable”.

For United Kingdom offshore fields, the gas reserves position at the end of 2002 was estimated by the Department of Trade and Industry and the United Kingdom offshore operators to be as follows:

<table>
<thead>
<tr>
<th>Ultimately Recoverable Gas Reserves (billion cubic metres)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>proven</td>
<td>2,355</td>
</tr>
<tr>
<td>probable</td>
<td>370</td>
</tr>
<tr>
<td>proven and probable</td>
<td>2,725</td>
</tr>
<tr>
<td>possible</td>
<td>330</td>
</tr>
<tr>
<td>maximum</td>
<td>3,055</td>
</tr>
<tr>
<td>(proven + probable + possible)</td>
<td></td>
</tr>
<tr>
<td>total cumulative production since late 1960s</td>
<td>1,726</td>
</tr>
</tbody>
</table>

In addition, the industry and the Department of Trade and Industry estimate that future gas discoveries could yield further gas reserves in the range 235-1390 billion cubic metres. Very broadly, this suggests that so far—over the period since the late 1960s—the United Kingdom offshore gas industry has produced rather more than half the gas which will ultimately be recovered from United Kingdom offshore waters. Production from United Kingdom offshore fields peaked in 2000/01 and is now set on a prolonged downward path.

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23 Shell’s written evidence p 112, paragraphs 1 and 2. [Not everyone would accept the proposition that gas is a pollution-free fuel. Gas produces relatively high levels of pollution (carbon dioxide, sulphur oxide and nitrous/nitrogen oxide) when extracted. It is also volatile and variable in composition and has to be industrially treated for transmission and use. In its end-use form, however, gas is less polluting than alternative fossil fuels.]
Net Import Demand

49. According to the European Commission, the European Union was 45 per cent dependent on imported gas in 2001 and they forecast that this dependency would increase to 59 per cent in 2010, and to 77 per cent in 2020. Most of the evidence that we have received predicts a European Union dependency on imported gas of between 70 per cent and 80 per cent between 2020 and 2030.

50. According to the evidence provided by the International Energy Agency (IEA), gas imports into the then fifteen Member States of the European Union were projected to more than triple from a 187 billion cubic meters (bcm) in 2000 to 632bcm in 2030. The IEA added that whilst gas reserves were abundant within economic reach of the European Union, it would require substantial investment to mobilise reserves to bring them to the European Union market and to distribute them to final customers. To encourage investment, the European Union market must be attractive for gas resources-owning countries to commit their reserves for export at competitive prices.

The Net Demand Position in the United Kingdom

51. Since the commissioning of the first interconnector pipeline from the United Kingdom to continental Europe in 1998, the United Kingdom has been a net exporter of gas but will increasingly come to depend on imports of gas. National Grid Transco estimate that by 2010, the United Kingdom will import some 50 per cent of its gas requirements. United Kingdom dependence on gas for power generation is forecast to grow from 40 per cent to 50 percent between now and 2010.

52. On the assumption that there will be no more discoveries for development in the UKCS, National Grid Transco predict a supply deficit of 21bcm in 2004/05 increasing to 43bcm in 2008/09 and to 67bcm in 2011/12. (Model A below)

53. If account is taken of a reasonable mid-point assessment of additional production from the UKCS from gas reserves yet to be discovered (see Box 2), the predicted supply deficit is ameliorated: it begins at 2bcm in 2004/05 and increases to 21bcm in 2008/09 and to 38bcm in 2011/12.

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24 European Commission’s written evidence p 42
25 IEA’s written evidence p 102. The International Energy Agency (IEA) is an autonomous body which was established in November 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD) to implement an international energy programme. It carries out a comprehensive programme of energy co-operation among twenty-five* of the OECD’s thirty Member countries. The basic aims of the IEA are: to maintain and improve systems for coping with oil supply disruptions; to promote rational energy policies in a global context through co-operative relations with non-member countries, industry and international organisations; to operate a permanent information system on the international oil market; to improve the world’s energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use; to assist in the integration of environmental and energy policies.

* IEA Member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States. The European Commission also takes part in the work of the IEA.

26 National Grid Transco’s written evidence, p 106, paragraphs 1.1 and 1.2
Thus the predicted supply deficit for the United Kingdom varies between:

<table>
<thead>
<tr>
<th>Year</th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/05</td>
<td>21bcm</td>
<td>2bcm</td>
</tr>
<tr>
<td>2008/09</td>
<td>43bcm</td>
<td>21bcm</td>
</tr>
<tr>
<td>2011/12</td>
<td>67bcm</td>
<td>38bcm</td>
</tr>
</tbody>
</table>

In any event, there will clearly be a need for significant volumes of gas imports to meet the United Kingdom’s growing supply deficit from 2004/05.\(^{27}\)

**Global Supply**

Virtually all witnesses agreed that there were ample supplies of gas throughout this period\(^{28}\). As Professor Stern of the Oxford Institute of Energy Studies said: “in terms of the whole of Europe it is hard to be concerned before 2015. We have now a considerable surplus, which is probably not going to disperse until after 2010. We have countries’ suppliers queuing up to supply Europe. It is only after 2020 that you get concerned about availability.” (Q 3)

In written evidence, the European Commission defined short-term security of supply as: “the ability to maintain continuity of gas supply even in the event of exceptional demand or where there are possible disruptions of gas supply of a technical, economical or political nature.” The Commission characterised long-term security of supply as the ability to ensure that future gas demand could be met by a combination of indigenous and imported gas supplies\(^{29}\). It is this latter concern that we consider in this Chapter.

**Long-Term Security of Supply: Diversification**

The Commission identifies diversification of sources of supply as a necessary measure to balance increasing import dependency on existing suppliers, notably Russia and Algeria. The three major pipeline additions to the existing European import pipeline network are: a projected North Transgas pipeline from the Russian Baltic coast to Germany, and possibly further; the Medgaz line linking Algeria and Spain; and the new pipeline from Norway (Ormen Lange) to the United Kingdom. However, there are potential sources of supply from Libya and Egypt by pipeline into southern Europe, and from the Caucasus and central Asia through pipelines via Turkey or Russia\(^{30}\).

**Liquefied Natural Gas (LNG)**

Technical advances in handling liquefied natural gas (LNG) have led to the beginnings of a global market for gas transported by sea in ships with insulated vessels. A number of sites for terminals are already operational or identified throughout the European Union including in the United Kingdom. It is clear that LNG will increasingly play an important role in delivering gas

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27 UK Offshore Operators’ Association written evidence, p 119
28 See Appendix 1 attached to UK Offshore Operators’ Association written evidence, p 124
29 European Commission’s written evidence p 42
30 European Commission’s written evidence p 43
GAS: LIBERALISED MARKETS AND SECURITY OF SUPPLY 25

Global Competition

59. However, it is important to bear in mind that the European Union will have to compete vigorously for this emerging market in LNG. In the United States, indigenous gas supplies are depleting fast and the United States’ imports, primarily through LNG, will be required on a major scale to feed the world’s biggest gas market. The position in Japan is currently stable, though demand is likely to rise as Japan emerges from a decade of economic stagnation. Japan draws its LNG from the Middle East and South East Asia. In addition, the Russian decision to build a pipeline to a port on Russian’s far eastern coast could provide gas for both Japan and China. China has, currently, a seemingly inexhaustible demand for energy and will be competing for piped Russian and central Asian gas as well as for global LNG supplies. India is also emerging as a potentially very large gas market.

60. While the Committee was conducting this inquiry, the International Energy Agency announced a considerable upward revision of its estimates for global gas demand. This was largely the result of the extraordinary sustained rates of economic growth achieved by China and India. If such high rates of growth were to continue, the consequential impact on energy demand would be far beyond that which has so far formed the basis of international prediction. Even with high discovery rates, the 60 years of world reserves estimated by Shell would steadily reduce as demand accelerated. We therefore recommend that the Government review its current estimates of future world demand to see how these figures compare with the IEA’s revised estimates and to examine what effect a rapidly increasing global demand will have on the availability of gas and on prices.

Long-Term Security of Supply—The Position of the United Kingdom

61. The United Kingdom is moving rapidly from a position of self-sufficiency to import dependence. Table 1 shows the predicted contractual import requirement for the United Kingdom. Table 2 gives an indication of the potential supply capacity from the combination of established supply sources and the earliest possible commissioning of the various import schemes that have been announced in response to the foreseen United Kingdom supply gap. In addition to gas being landed from the UKCS, gas from the Norwegian North Sea fields is also landed via St. Fergus in Scotland. The United Kingdom landing point at Bacton in Norfolk is the beachhead for the first interconnector which links the United Kingdom to continental Europe at Zeebrugge in Belgium. The interconnector (IUK) has currently a greater export capacity from the United Kingdom’s offshore fields than the capacity...
to import gas from the continent, and Table 2 shows the impact of the planned 2 phase expansion of Interconnector (UK)’s import capacity.

**TABLE 1**

**Contracted Gas Supply**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>UK</th>
<th>Vesterled</th>
<th>Pipeline</th>
<th>LNG</th>
<th>Average Demand</th>
<th>Severe Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>100</td>
<td>200</td>
<td>50</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>2020</td>
<td>150</td>
<td>200</td>
<td>50</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

**TABLE 2**

**Potential New Import Projects**

62. In paragraph 53 above, we noted that one forecast indicated a lower boundary, or worst-case, for the supply deficit of 43bcm in 2008/09 and 67bcm in 2011/12 and a more realistic projection (including future United
Kingdom gas discoveries) which suggested a deficit of 21bcm in 2008/09 and 38bcm in 2011/12. Table 1 expresses this supply deficit in terms of contracted supply. Table 2 shows the earliest possible market response to the foreseen supply gap. In practice, the new import schemes are likely to be timed in such a way as to avoid the “spike” of over-supply around the end of this decade.\(^{34}\)

**New Import Schemes\(^{35}\)**

63. A number of new supply routes is planned: the largest - which would bring gas from the Ormen Lange field in the Norwegian Sea along a 1200 kilometre pipeline to Easington in Yorkshire - is designed to deliver a maximum import volume of 20bcm a year. The interconnector from the continent to the United Kingdom is expected to increase import capacity by upgrading the compressor stations to achieve a total import capacity of 16.5bcm a year from the winter of 2005-2006, and a further expansion is being considered for later. There is a proposal to link the northern Netherlands (Balgzand) to Bacton by a new interconnector which would be designed to provide upwards of 10bcm a year.

64. National Grid Transco are currently building an LNG terminal at the Isle of Grain, which will handle, initially, 5bcm a year rising progressively to 15bcm. ExxonMobil is planning to import LNG from Qatar in the Persian Gulf through Milford Haven. The design capacity for the ExxonMobil terminus will be 15bcm a year. Petroplus are also planning an LNG facility at Milford Haven designed to deliver 10bcm a year.

65. Beyond this, there are tentative proposals to connect the United Kingdom to a Russian pipeline, possibly the North Transgas pipeline through the Baltic. This could be expected to deliver between 20 and 30bcms a year. More uncertain, is the possibility of an interconnector with Denmark delivering, possibly, 5bcm a year.

**Timing**

66. The important aspect of this increase in capacity is when it will come to the market. The National Grid Transco Isle of Grain LNG project is due to complete in 2005 to a level of 5bcm a year, but with plans to increase to 15bcm a year later. The Petroplus project at Milford Haven is currently expected to come on stream around 2006/07 and the ExxonMobil Milford Haven LNG scheme from 2006/07. Upgrading the interconnector with Belgium is expected to be completed in 2005/06. The Ormen Lange pipeline is expected to be completed in 2006, although gas will not begin to flow through it until the third quarter of 2007. The mooted interconnector from Holland to Britain could, at the earliest, be delivering gas around 2006/07.\(^{36}\)

67. As can be seen from the above, there appears to be an adequate availability of natural gas within economically viable reach of the European Union and, in the case of the United Kingdom, plans are already under way to increase the number of entry points —and thus to increase flexibility of supply.

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\(^{34}\) Platts UK Gas Report Issue 258, 3 May 2004, pages 1 and 2

\(^{35}\) See Appendix 11 UK Offshore Operators’ Association written evidence, p 125

\(^{36}\) Ofgem’s written evidence, p 68 and UK Offshore Operators’ Association written evidence, Appendix II, p 125.
Other Issues that Affect Availability of Gas

68. The problem, over the next 15-20 years therefore, is not so much the availability of gas as the ability to move it from the places it is produced to the markets. This requires an extensive pipeline system, often in areas of geographical difficulty such as the north Norwegian Sea, the Barents Sea and Siberia. There is therefore a need to marshal the considerable amount of capital needed to finance such infrastructure.

Investment

69. According to the evidence of the International Energy Agency, the investment requirement in gas infrastructure for the Organisation for Economic Cooperation and Development (OECD) Europe\textsuperscript{37}, will amount to a total of $465 billion between 2000 and 2030\textsuperscript{38}. In the past, investment in infrastructure has been paid for by the gas supply companies and the producing companies on a shared risk basis. This has led to considerable duplication of pipelines in continental Europe and to the position where, as Ruhrgas reported, some 700 companies were involved in the pipeline systems in Germany (Q 175). But the investment risk was also ameliorated by being based on long-term take-or-pay contracts which, in turn, were funded by high consumer prices\textsuperscript{39}.

70. As the European Union gas market liberalises, while it may gain additional flexibility and, possibly, better use of existing assets, it will at the same time erode the substantial margin of insurance in the form of long-term agreements with producers and substantial strategic storage paid for by higher consumer prices. This safety margin was built up through the managed market, but long-term contracts will remain a major feature of the European Union gas markets\textsuperscript{40}.

71. The rate of transition to the liberalised market is likely to be different in different Member States, and the period of transition from the existing managed market system to a fully liberalised market—similar to that operating in the United Kingdom—will possibly take some time. This, in itself, presents problems for the proper functioning of competitive markets\textsuperscript{41}.

\textsuperscript{37} Organisation for Economic Co-operation and Development: Pursuant to Article 1 of the Convention signed in Paris on 14 December 1960, and which came into force on 30 September 1961, the Organisation of Economic Co-operation and Development (OECD) shall promote policies designed: to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy; to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations. The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28 April 1964), Finland (28 January 1969), the Organisation of Economic Co-operation and Development (OECD) shall promote policies designed: to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy; to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations. The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28 April 1964), Finland (28 January 1969), Australia (7 June 1971), New Zealand (29 May 1973), Mexico (18 May 1994), the Czech Republic (21 December 1995), Hungary (7 May 1996), Poland (22 November 1996), the Republic of Korea (12 December 1996) and Slovakia (28 September 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

\textsuperscript{38} Written evidence from IEA, p 102

\textsuperscript{39} Written evidence from ENI, p 90; Gastransport Services, p 98; and Gas Natural SDG s.a., p 97

\textsuperscript{40} Written evidence from the European Commission, p 42

\textsuperscript{41} Written evidence from ExxonMobil, p 94 and Interconnector (UK) Limited, p 101
72. We applaud the determination that the Commission has expressed in pushing forward the implementation of the Second Gas Directive and the Regulation on third party access. But the Commission is almost certain to encounter resistance from existing and time-tested systems of supply, and concern from consumers, and from some of their governments, that the security that the old systems brought with them might be reduced at a time when competition for energy, and particularly gas, is bound to increase globally.

**Incentives for Investment in the Second Gas Directive**

73. The Commission has, commendably, recognised a need to provide some incentive to investors and, where new investment is needed, ironically, this takes the form of exemption from the strict application of market principles governing third party access (Article 22). One witness also recognised a need for the Regulator to use tariffs in such a way as to provide support for investment.42

74. Many witnesses recognised the importance of a regulatory framework to attract investment.43 “EU legislators help to maintain the right investment and regulatory climate by recognising an adequate return on existing and new assets.”44 As Ruhrgas noted, “such a framework should be geared towards stability and calculability and foster a favourable investment climate. Such policies should also attach great importance to dialogue with non-European producer countries and send the right signals to those countries too for major investments concerning future European supplies.”45

75. Two points emerge from the evidence. One is the importance of a political dialogue with producer countries; the other, is the importance of a regulatory system that is both sufficiently predictable and sufficiently flexible to encourage the very heavy investment needed while increasing competitive pressures in the market place, a difficult balance to maintain.

**Political Dialogue with Producing Countries**

76. Many witnesses felt the European Union ought to attach a high priority to establishing a political dialogue with gas-producing countries. This was important in order to strengthen the commitment of the producers to meeting the market needs of European Union Member States. However, none was able to point directly to the effect of the political dialogue on the behaviour of the supplying companies—whether they were state companies, as in the case of Russia and Algeria, or private companies. Clearly, a dialogue with Russia will be different from a dialogue with Norway, particularly now that Norway has reduced the state’s dominance in the Norwegian supply companies. The European Union has, for some time, maintained a formal

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42 Written evidence from Gastransport Services, p 100, paragraph 7.1.2
43 Written evidence from Ruhrgas AG, p 33; Gas Natural SDG s.a., p 97; Department of Trade and Industry, p 54; Powergen, p 110; Statoil ASA, p 117; International Energy Agency, p 105; Centrica Plc, p23; Ofgem, p 68; ExxonMobil, p 94; and Eurogas, p 92.
44 ENI’s written evidence, p 91
45 Written evidence Ruhrgas AG p 32
46 Written evidence ENI p 90; Gas Natural SDG s.a. p 96; and Gastransport Services p 98
47 Witnesses: Ruhrgas AG, p 32; ENI, p 90; International Energy Agency, p 103; Professor Jonathan Stern, p 1; Gastransport Services, p 98; Gas Natural SDG s.a., p 96; and the European Commission p 43
political dialogue with Russia which, while not explicitly linked to the supply of gas, is intended to enhance the supply relationship. A similar dialogue has also been under way since the late 1990s with Mediterranean suppliers.

The Energy Charter and Transit Protocol

77. Professor Stern, of the Oxford Institute for Energy, when asked about difficulties of transit for Russian gas, argued that the Transit Protocol to the Energy Charter would provide the necessary insurance but that, unfortunately, to date, Russia had neither signed the Charter nor ratified the Protocol (Q 5). Mr Eggar, the former Minister of Energy, however, discounted the value of the Charter and the Transit Protocol arguing that decisions on investment in Russia were not linked to the aspirations of the Energy Charter or Transit Protocol. He added that it was unlikely that Russia would see it as part of its national interest to sign the Charter or the Transit Protocol (Q 324).

78. However, the International Energy Agency pointed out that the temporary disruption of the supply lines through Belarus and the Ukraine had not, in practice, affected the supply to the end-user in the European Union. Gazprom, the Russian supplier, had used gas from its German storage to meet the needs of its customers. As Mr Eggar said, “I think it was a message delivered to Belarus but designed in such a way as to minimise any fears in Western Europe. I think it was quite carefully calculated, as I understand it, to send a message but not actually to harm Russia’s overriding commercial interests.” (Q 324).

The Regulatory Framework for Investment

79. As we have previously noted, a number of witnesses drew attention to the need for a regulatory framework that was sufficiently flexible so as to attract investment on the scale required. The European Commission, for example, said that it was crucially important to ensure that the necessary investments were made to allow the import capacity of the European Union to expand. In commenting on the effectiveness of the Second Gas Directive, the Director of Conventional Energies in the Directorate-General for Transport and Energy (DG TREN), Mr Helmut von Sydow, wrote “Article 22 of the Second Internal Gas Market Directive (Directive 2003/55/EC) provides for a regulatory framework for some key infrastructure. It allows exempting this infrastructure from TPA [Third Party Access] rules, thus taking full account of economic risks potentially undermining these investments.”

80. Energy companies predict that there will need to be a doubling of the pipeline infrastructure and LNG terminals in the European Union over the next 20 years. This will require important investment decisions to be taken, not only by the potential investors but also by the Regulators now required

48 The Energy Charter Treaty was conceived in the early 1990s as a way of facilitating flows of energy principally but not exclusively from Russia to Europe. In the late 1990s, the Treaty developed a Transit Protocol to create a legal framework with independent dispute resolution. Most of the 51 signatories (of which 48 have ratified the Treaty) have signed the Transit Protocol. Russia has neither ratified the Treaty nor signed the Transit Protocol. See Q 5.
49 Written evidence from IEA, p 103
50 Written evidence from Gastransport Services p 99
51 Written evidence from European Commission p 42, and from ExxonMobil, p 93
81. It will be vitally important for the decisions of all Member States’ Regulators to be transparent and to be seen to be even-handed. As individual Member States implement the Directive and establish Regulators where these do not exist already, there may well be notable differences between the powers the different Regulators enjoy. In turn, this will affect the nature of the decisions they are able to make and, where cross-border investments are concerned, such diversity of regulation could cause difficulty. Over time, the European gas pipeline system will become a more integrated and unified system, and existing price differentials will erode. We welcome the European Commission’s foresight in introducing the proposed Regulation on Third Party Access as an important step towards the creation of a unified market in Europe. **We recommend that the Commission and Member States consider clearly how regulation of these important markets is to evolve, and that the many detailed questions relating to the commercial and operational aspects of its implementation are addressed as soon as possible.**

**Will the Liberalised Market Provide a Sufficient Inducement for Investment?**

82. Mr von Sydow put his finger on an issue which concerned the Committee, namely, how would an increasingly competitive domestic European Union market produce the right signals, incentives and investigation of risks for investment in the infrastructure. The responses, particularly from United Kingdom witnesses, were that the predictability, transparency and fairness of the United Kingdom regulatory system was, in itself, an attractive inducement for investment in addition to the size and openness of the market.

83. This was a point supported by ExxonMobil International Limited who listed four key elements for any policy relating to security of gas supply which should include:

- stability of fiscal and legal frameworks;
- freedom to build, own, and operate infrastructure;
- minimal regulation;
- no direct Governmental intervention in investment decisions.

ExxonMobil pointed out that European taxes on energy were considerably higher than those in the United States or Japan and that this was a key element influencing investment decisions of international gas companies.

84. In its own negotiations for its projected LNG terminal at Milford Haven, ExxonMobil has sought to take advantage of exemption from third party access as part of the deal to secure its investment. Ofgem confirmed that both ExxonMobil and Petroplus were in the process of talking to them about the system of regulated third party access and exemption from it (Q 288). In

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52 *Written evidence from ExxonMobil, p 93*
this context, it is interesting to note the *Huckberry* decision in the United States of America not to apply rules on third party access to LNG terminals and gas import pipelines.\(^{53}\)

85. In the United Kingdom, National Grid Transco, the national transmission operator, makes investment decisions based on economic signals both from long-term entry capacity auctions and from information provided by the industry. Some witnesses have pointed to the planned investment in the United Kingdom by those promoting the new import schemes as evidence that the market-based system does provide adequate signalling for investment and that the regulatory framework is sufficiently adaptable to attract such investment (see Table 2).

86. In his evidence, Mr Eggar confirmed the amount of capital that would be required for the projects currently under discussion. He suggested that a credible figure over a 15 year timeframe lay somewhere between €150 and €250 billion euros. The capital markets would have no difficulty providing that money, it would be the cost of the money that would critical (Q 311). “In my view, you are likely to get a number of financial institutions which will be prepared to supply a significant amount of both the equity and the debt even though they are not themselves companies which are set up specifically to transport gas. This is a utility business and it is just a question of lending money against an acceptable rate of return.” (Q 313). Asked how the need to attract large-scale investment squared with a liberalised market, Mr Eggar thought that it would be a pragmatic arrangement, a series of *ad hoc* decisions rather than a single overriding system. He did not think this was a problem, provided the decisions were transparent, and the reasons given for them, explicit.

**Assessment of Medium and Long–Term Risk**

87. The pressure to liberalise the European union internal gas market, the growing dependence on imported gas, the possibly uneven implementation of the Second Gas Directive and differences in national regulatory regimes present risks which potential investors will need to take into consideration when making decisions on projects that will be extremely costly.

88. *In our judgment, the benefits of supporting rapid implementation of the internal market in gas outweigh the dangers. The draft Regulation governing the conditions of Third Party Access to transmission networks will make compulsory the guidance to regulators compiled by the Madrid Forum, which embraced the views of industry. This should, over time, produce a relatively common regulatory regime throughout the European Union, thus creating an element of legal and regulatory certainty for would-be investors. The risks inherent in greater dependence on imported gas can be balanced by greater diversity of supply. This is clearly a development that is already well advanced.*

\(^{53}\) This judgment allowed LNG terminals to be built without imposing third party access obligations. This has led to a rapid expansion of LNG terminals in the USA.

\(^{54}\) Written evidence from International Energy Agency, p 103
CHAPTER 4: LOW PROBABILITY/HIGH IMPACT SHOCKS TO THE SUPPLY SYSTEM

“If . . .”

89. On 10 March 2004, the BBC broadcast an imaginary incident in which gas supplies to the United Kingdom were interrupted by a combination of severe winter weather and a terrorist attack on a compressor station located in the Russian Federation. It suggested that this could lead to a catastrophic loss of supply to customers in the United Kingdom.

90. While the purpose of the film was undoubtedly to draw attention to the United Kingdom’s increasing vulnerability to sudden shocks to the gas supply system, it implied a critical dependence on gas supplies from the Russian Federation transiting continental Europe to the United Kingdom. Yet imports of gas into the United Kingdom from Russia are unlikely to become significant before 2010.

91. However, as the United Kingdom moves from a position of national self-sufficiency in gas towards increasing dependence on imported gas, we are now in a critical period before the new import schemes and linking infrastructure designed to diversify sources of supply and to increase the range of options come on stream. In paragraph 66 we noted the dates on which the new import projects could begin to contribute to the availability of gas in the United Kingdom. The issue we address in this chapter is that of a low probability/high impact event that could lead to a major loss of gas to the system, particularly over the next winter or two of unusual supply tightness.

The Asymmetric Nature of the Risk to Gas Supply

92. The nature of risk in the gas market is asymmetric. The consequences of failure are politically insupportable, socially harmful and economically expensive. Action to counter risk, however, is often difficult to justify on purely commercial criteria and there is little incentive for the market to address exceptional conditions. (see Box 3).

93. Failure to provide sufficient insurance in the form of access to a contingency reserve of gas stocks combined with the loss of gas supplies on a large scale could lead to exceptionally serious consequences. Part of the difficulty in reconnecting customers lies in the demanding health and safety requirements under existing regulations. In a period when a possible interruption of supply appears to be more likely, the trade-off of risks to public safety has changed and it is important that unnecessary delay in reconnecting customers be avoided. We therefore recommend that the Government review existing regulations in this respect to examine the possibility of introducing fast-track reconnection practices for large-scale emergencies.
BOX 3
Loss of Gas Supplies

When mixed with air, gas is potentially explosive. Gas is transported through pipelines under pressure. If pressure is lost because of damage to a pipeline or a shortfall of supply in relation to the prevailing offtake from the network, there is a risk of potentially fatal explosions.

For this reason all elements of the gas supply chain are subject to stringent safety regulations, and the applicable legislation requires a designated operational manager from Transco to act as the National Emergency Co-ordinator if there is an imminent and serious threat to gas supplies.

Once gas supplies to consumers are disrupted, every supply point must be shut off at the meter. When sufficient gas is again available, the system must be commissioned with great care—each sub-network; each main; each meter. Necessarily, this is manpower-intensive and time-consuming; and to add to this, UK Safety Regulations require that when a property is reconnected, the fitness of the appliances is also checked.

The modern British gas industry has had a good record in dealing with the small number of significant gas supply failures—usually because of damage to gas pipelines caused by third-party contractors. Few incidents have affected many more than 10,000 properties, and full restoration has been achieved in a couple of weeks or so—difficult and disruptive as that is for the consumers affected. Not long ago supplies were nearly lost to 50,000 properties in one town, and the subsequent investigation indicated that, with the industry’s current pool of qualified gas operatives and the diversity of their employment, and under existing safety regulations, restoration would have taken 8-10 weeks.

By contrast, the world’s most extensive loss of gas supply occurred in 1999 in the state of Victoria, Australia. Some 1.2 million gas consumers were cut off because of an explosion in a gas processing plant. Here, by virtue of favourable weather, ample manpower ready to handle such civil contingencies, and by suspending the normal safety procedures, supplies were restored in little more than 2 weeks.

In Britain, it is recognised that there is a pressing need to have effective contingency plans in a constant state of readiness. To this end, the Gas (and now, Electricity) Industry Emergency Committee has been set up by the industries and the Government. Looking ahead, the risks are increasing because of:

— the tightness of gas supplies to meet the winter peak;
— Britain’s steadily growing dependence on imports;
— the greater threat of terrorist action;
— and the progressive scaling down and dispersion of the body of suitably qualified and accredited gas technicians as a consequence of competitive or regulatory pressures.

The major emergency exercise conducted by the industry and the Government last September confirmed that, without regulatory changes to streamline the restoration processes, full recovery from a large-scale loss of gas supply would still take upwards of 2 months.

The economic and social consequences would be devastating and if, as seems most likely, such an incident were to occur in winter, there would be serious risks to public health and safety.

Market Failure

94. On the other hand, to err too much on the side of caution leads to over-provided assets which are inherently less economically efficient. In the case of gas, it is arguable that consumers would want to be adequately insured against low probability/high impact events because the effect of such insurance on gas bills would be small. However, it is unlikely that the markets would wish to provide insurance against more extreme events because the benefits would be too infrequent and uncertain to justify the costs.
Some witnesses have argued that the market works in the sense that the new infrastructure designed to increase diversification of supply into the United Kingdom is a response to market signals (Q 300). But investors target their commissioning date to ensure good utilisation from the outset, rather than the earliest time when it would be prudent to have the capacity available from the point of view of security of supply.

So we see a rising dependence on gas in the United Kingdom and an increasing dependence on imported gas after 2005 for a growing proportion of energy used to generate electricity. At the same time, it is unlikely that the fully liberalised market will, left to its own devices, provide adequate insurance against sudden large-scale shocks and disruption. The Government and the Regulator are in a difficult position because if they are seen to intervene, market psychology would change and this would take the pressure off the commercial participants to cover such eventualities.

Storage

Gas supply companies in Member States that have long been dependent on imported gas have sought to have ample insurance in the form of strategic storage. France, Germany and Italy all have storage capacity equal to 20 per cent of annual demand or more (see Table 3). In the United Kingdom, this ratio currently stands at 4 per cent. This means that the United Kingdom would have in theory some two weeks of storage to draw on in an emergency but only a small proportion could be recovered in that period. Some new storage capacity is being planned for in the United Kingdom in the form of on-shore facilities in salt caverns, such as those planned at Aldbrough and Humbly Grove. These, however, are not storage in the sense of a strategic reserve but are designed for operational use in conjunction with trading.

<table>
<thead>
<tr>
<th>Country</th>
<th>Storage Capacity (%)</th>
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<tbody>
<tr>
<td>UK</td>
<td>4</td>
</tr>
<tr>
<td>Belgium</td>
<td>5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5</td>
</tr>
<tr>
<td>Denmark</td>
<td>20</td>
</tr>
<tr>
<td>Germany</td>
<td>20</td>
</tr>
<tr>
<td>Italy</td>
<td>20</td>
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</tbody>
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(The French figure is slightly higher than that for Italy)

Source: Centrica plc
98. In the case of a major shortage of supply that, for example, arose from sudden and severe climatic conditions in mid-winter, access to supplies from the continental system could be difficult and available only on an interruptible basis. On the continent, and in the United Kingdom, there is a perception that a threat to the security of supply could psychologically inhibit greater flexibility—non-household customers stay with the more expensive contracts for firm supply and those that have interruptible contracts are increasingly induced to change to firm contracts, thus reducing demand-side flexibility in the balance of supply and demand.

99. We are disturbed by the very low storage capacity available to the United Kingdom during this period. While we would not go so far as to recommend an increase in storage approaching that of continental Member States—on the grounds that after 2007 a sufficient diversification of supply would in itself provide a measure of insurance to cover such shocks—nevertheless, we do see a case for the Government to look urgently at the measures needed to protect consumers as the United Kingdom market ceases to enjoy the security of ample production capacity from the United Kingdom offshore fields close to the market.57

Winter Peaks

100. The United Kingdom has traditionally regarded the United Kingdom Continental Shelf reserves as a readily accessible prime source of supply, and one which could accommodate the seasonal swing from summer to winter. These reserves are depleting and the rate of depletion is increased by the need to maintain high exports of this gas in the summer months in order to exploit the reservoirs efficiently. For the last few years, the United Kingdom has had to import gas to meet winter peak conditions. Table 4 below shows that this peak import has reached the limits of the current import capacity of the interconnector.

101. Table 4 shows the pattern of gas flow through the interconnector linking the United Kingdom to the continental terminal at Zeebrugge during the period 2000-2003. The dotted lines indicate the current capacity limits of the pipeline. The interconnector has initially been geared more to exporting gas from the UKCS during the summer months; the import capacity to cover peak winter demand in the United Kingdom has been limited. This is now to be expanded (para 66) but will not become fully effective until 2006/07.

102. It is important to recognise that any new capacity for the United Kingdom transmission network should be capable of accommodating not just peaks of demand (“the-one-in-twenty-winter”) but maximum capacity of all import flows. The Regulator should therefore be required to recognise the importance of peak coverage when dealing with transmission investment decisions. This should also extend to issues such as connecting the proposed liquefied natural gas (LNG) terminals to the existing pipeline system in such a way as to ensure that these links are sized to handle the maximum flows which might be achieved in peak winter conditions.

57 We made a similar point about the need to increase United Kingdom gas storage in our report “Energy Supply: How secure are we?”, 14th report, session 2001-02, HL Paper 82, (paragraphs 62-65)
103. Table 5 suggests that taking both UKCS supply, withdrawal from storage, and projected import capacity into account, the maximum gas supply will just meet peak winter demand in 2005/6. Forecast available capacity at that time would be almost 50 per cent short of the “one-in-twenty-years” peak
day demand. Everything would then need to be pinned on an exceptional demand-side response in the form of contractual interruptions and the release of committed gas supplies in order to realise high spot prices.

**TABLE 6**

**Demand Swing 2006/7**

| Source: Interconnector (UK) Limited |

104. Table 6 shows the effect of increased import capacity expected to come online by 2006/7. Here, capacity is predicted to be well in excess of the normal peak winter demand but still falls short of meeting the “one-in-twenty-years” peak day demand—again calling for a demand-side response to high spot prices.

105. It is clear, therefore, that the demand/supply balance required to meet peak winter demand over the next two years—2004/05 and 2005/06—will be tight. Nor is there any resilience in this balance to meet the unexpected. A severe winter could cause serious concern, as could a major terrorist attack on the gas delivery infrastructure.

106. When we expressed concern to the Minister about coverage for the next two winters, Mr Timms replied “my answer would be that the capacity we need is not yet in the bag but I am confident it will be in the bag in time for those demands arising over the next two winters” (Q 232). Tables 5 and 6 show that even with the projected new import capacity, the industry has not currently, and will not have before the end of the decade sufficient capacity to meet Transco’s “one-in-twenty-years” peak day, ie the exceptionally severe weather that might occur once in twenty years.

107. We acknowledge the Minister’s answer to be finely judged. But we remain uneasy and therefore recommend that the Government review, as a matter of urgency, the projected demand for the next two to three winters in the light of the ability of United Kingdom supply
companies to access gas from the continental pipeline system, and in the market itself, the scope to realise demand-side flexibility in the balancing of supply and demand.\footnote{We reiterate a recommendation made in our report “Energy Supply: how secure are we?”, 14th Report, 2001-02, HL Paper 82, paragraph 66}

108. It may be that options other than supplying gas exist to meet exceptional demand for power and that supply companies will be able to turn to oil or coal-fired plant. Financial or contractual inducements might be offered to persuade major customers to switch to other forms of power-generation, thus reducing overall demand for gas at a critical time. We have not taken evidence on this. We note, however, that in National Grid Transco’s recently published Preliminary Winter Outlook Report 2004-2005\footnote{Preliminary Winter Outlook Report, 2004-1005, National Grid Transco, 14 May 2004, Summary, paragraph 8 and paragraph 9}, the TSO foresees the use of market-related methods for reducing demand for gas in order to meet peak demand targets.

109. On 17 May 2004, the press reported Mr Alistair Buchanan, the Chief Executive Officer of Ofgem as saying: “there is substantially more generation available than we had anticipated going in to the previous winter and, apart from extreme conditions, there should be adequate gas supply.”\footnote{Financial Times, 17 May 2004, p2} Our concern is to know what action can be taken to counter “extreme conditions”.

**Emergency Action in the Case of Low Probability/High Impact Shocks**

110. Mr Alistair Buchanan told the Committee what would happen in the event of a low probability/high impact shock. The emergency would be co-ordinated by the gas and electricity industries’ emergency committee taskforce led by the Chief Operating Officer of National Grid Transco. This group would be responsible for communication and co-ordination, working with the Department of Trade and Industry. “There is a structure it is tested every year, there was a two day trial that we went through last year . . .” (Q 300). Clearly, however, if there were, for example, a terrorist attack on either of the two existing terminals at St Fergus in Scotland and Bacton in Norfolk, then this could produce a national emergency for which the Government would have to assume immediate responsibility. The Committee, however, was in no position to judge whether this would produce the dire result which, on the face of it, might appear possible; the gas infrastructure has considerable redundancy built into it to ensure a continuous supply to customers. We would welcome the Government’s assurances on this\footnote{There have already been a number of such shocks in the form of trawlers hitting the Rough storage facility, and lightning strikes at terminals. In such cases, the market has responded appropriately (Q 300).}.

**The British Dilemma**

111. Clearly however, there is a dilemma here which the Committee was unable to resolve with our witnesses. In the last year or two, public policy objectives for energy regulation have begun to shift away from the purely economic dimension—reducing consumer prices—to a more complex set of trade-offs between environmental, social and now, supply security objectives. For
Ofgem, with its unrivalled success in promoting and facilitating gas and electricity privatisation, the dilemma is how to frame Britain’s fully liberalised gas and electricity markets so as to serve these wider policy objectives without at the same time compromising the dynamic of the market and blunting the incentives, responsibilities and liabilities of the participants in it. The difficulty for both Ofgem and the Government will lie in resolving this dilemma now that the British gas market is moving from self-sufficiency towards growing dependence on access to continental infrastructure, when the continental interpretation of market liberalisation is still more limited than that of the United Kingdom and when, in any case, a fully liberalised European gas market is probably still years away from realisation. We would welcome the Government’s view on how this situation might be addressed.

Assessment of Risk

112. While the gas supply/demand balance remains tight, there is a significant risk of interruption to United Kingdom gas supplies and distribution. We cannot assess this accurately, hence our recommendation in paragraph 107 above that the Government re-assure us on this point. We expect the risk to diminish from 2006/07 onwards as major new import capacity comes on stream. But even then, it is difficult to see what flexibility and resilience there will be in the system to meet the risk of a “one-in-twenty years” peak day demand. Nor are we able to quantify the ratio of risk posed by the threat of a terrorist attack on the physical infrastructure; given recent events elsewhere in the world, this must surely be higher than National Grid Transco’s “one-in-twenty-years” figure. We conclude, therefore, that there is considerable, if unquantifiable risk, particularly short-term, in the United Kingdom’s gas supply system and we urge the Government to review its emergency procedures for handling a sudden and major loss of gas.

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62 A similar warning about building up storage capacity was made by Gastransport Services in written evidence, p 99
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

European Union Legislative Proposals

113. The proposed European Union legislation will, on paper, lead, probably slowly, to the establishment of a liberalised market for gas in the European Union. But it will not, of its own accord, deal with distortions to the market caused by market dominance and market power. The Commission has promised not only to benchmark but, if necessary as early as 2006, to review the process to ensure that liberalisation begins to bite.

Implementation

114. We note these assurances by the Commission but, at the same time, we are conscious of the patchy history of liberalisation of utilities in the European Union. It is not at all clear, at this stage, what effect the enlargement of the Union to 25 Member States will have on the creation of a fully liberalised gas market. From a security of supply point of view, the ultimate insurance for the European Union will, in our view, be the adoption of a fully liberalised market coupled with diversity of sources of supply and underwritten by the innate flexibility that the market brings. We recognise that for many in continental Europe, the well-tried system of a managed market at higher prices will continue to appear attractive and that the flexibility and freedom of the market would appear to introduce elements of uncertainty. The process, therefore, of adapting these markets will not be quickly achieved (Q 309); the unpredictability of the transition period and unequal rates of implementation in different Member States may inhibit investment. Slow and uneven implementation across the European Union will reduce the benefits that full liberalisation could be expected to bring.

Market Power

115. The issue of market power wielded by vertically-integrated companies, some being national champions, will provide a serious inhibition to the rapid development of the market. Regulation will achieve the blueprint for the market, but its adoption will continue to be, as in the past, heavily dependent on political will in all Member States in addressing the operational and commercial details of implementation (Q 274 and Q 290). The Regulation will not comprehensively address such difficulties as: different operational procedures among different transmission systems operators; the variations in nomination procedures for transmitting gas; different access conditions among different networks; unreasonable liability provisions; penal and arbitrary out-of-bounds penalties; information about maintenance in different networks; in short, free and open communication between operators.

116. All these problems could be resolved by the early introduction of a pan-European Union network code enforced at Member State level by national regulators (Q 316). The necessary Draft Regulation is currently being negotiated in the Council Group and in the European Parliament. A prime United Kingdom objective is that the Regulation should embody the guidelines agreed in the Madrid Forum by Member States, Regulators, Transmission Systems Operators and System Users (the supply companies). An important omission in the negotiated text is the absence of enforceable guidelines on access to storage. We believe that the compulsory application
of the Madrid Forum guidelines would be likely to bring about convergence of market practice throughout the European Union gas market.

**Availability of Gas**

117. All our witnesses supported the contention that there will be ample reserves of gas within economically viable reach available to the European Union and to the United Kingdom for the next decade. There will probably be adequate reserves of gas available globally well beyond 2020. The United Kingdom will achieve a greater measure of security of supply when new deliveries of piped gas begin from Norway, when additional interconnector capacity is operational from 2006, and when Liquefied Natural Gas cargoes, from a diversity of sources, are expected to be landed from 2006/07. However, this period will also see rapidly increasing demand for gas in other European Member States, as well as in the United Kingdom, particularly if other Member States follow the United Kingdom example of basing a considerable proportion of electricity generating capacity on gas. Any respite gained from additional import capacity in the United Kingdom will begin to be neutralised as import demand globally, and in the European Union, accelerates. A subsidiary problem will be the need to create the pan-European infrastructure to deliver this gas to the customers. On some estimates, the European Union’s requirement for imported pipeline gas will double over the next 15 years. This issue has been foreseen in the Second Gas Directive where Article 22 will provide Regulators with the flexibility to accommodate special rates and tariffs to stimulate investment.

**Low Probability/High Impact Shocks**

118. So far as the United Kingdom is concerned, we have some doubts about whether or not the country could survive a low probability/high impact shock over the next two winters when supply at peak times is already stretched to the limits. We were not reassured by the Government’s evidence on this point. We accept that as new import schemes diversify the sources of supply for the United Kingdom from 2006/2007 onwards the United Kingdom market will become less tightly supplied and more resilient to shock, but changes in the patterns and volumes of gas consumption throughout the European Union, or globally, give no grounds for complacency after 2007. Even when the new import schemes are operational there is still a question as to whether a market-based, “just-in-time” system will provide insurance against exceptional circumstances, or a sufficient demand-side response to supply shocks.

**Other Issues that Affect Security of Supply**

**Gas Quality**

119. Gas is not a uniform product. It requires industrial and chemical treatment to meet national and international specifications for use by customers. In most cases, the additional treatment is borne by the suppliers in order to bring the gas to market. In parts of continental Europe, in Germany in

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63 Gas imported, into the United Kingdom does not normally meet United Kingdom national specifications. It is treated at the point of entry to the United Kingdom transmission network, usually by nitrogen injection.
particular, more than one specification is accepted in order to maximise indigenous sources of gas. This has led to separate balancing zones—ie supply and distribution networks for high calorific gas and low calorific gas. While we understand the logic of exploiting indigenous European low calorific gas resources, the existence of different systems which incur additional costs to become mutually compatible, must be regarded as a potential barrier to a fully liberalised market and hence bear on security of supply within the European Union.

Prices

120. The liberalisation of the United Kingdom gas market and the Regulator’s defence of customer interests has brought about the lowest gas prices in the European Union (Q 26). The question remains, about the degree to which such prices will continue to remain low. Ruhrgas, for example, predicted that as United Kingdom dependence on imported gas increased, so prices would rise (Q 179). The Commission also forecasts an increase in gas prices of 2 per cent a year from 2010 across the European Union, which is an increase of 21.9 per cent after 10 years.

121. Current high prices for oil on the spot markets, if sustained, can be expected to feed into gas prices in the markets for traded gas. Most European Union supplies come in the form of long-term contracts with periodic price revision formulae, so the impact of the current high oil prices will possibly be felt progressively as these revision clauses are triggered. Prices for gas traded in the United Kingdom and European Union markets, which constitute around 25 per cent of the total supply volumes, have, to an extent, begun to reflect the higher oil prices.

LNG

122. Considerable importance is now being attached to deliveries of liquefied natural gas (LNG) to the European Union and to the United Kingdom in particular. We believe that this form of gas will play an increasingly important role in the European gas market. Technological advances have brought down the price of LNG so that it is now competitive with piped gas moved over long distances, and it has one great advantage, it is flexible.

123. However, its flexibility will be possibly one reason why the European Union should be concerned about its increasing dependence on this source of gas. Gas, especially in the form of LNG, has become a global market and as the United States of America’s indigenous gas reserves deplete rapidly, its appetite for LNG will soar. Nor can we see a reduction in the already

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64 European Report No.2865, 1 May 2004, p III-7
65 http://europa.eu.int/comm/dgs/energy_transport/publication/analysis_fr.htm
66 Witnesses argued about the effect of the link between gas and oil on prices. Historically this link was perhaps inevitable when gas was a by-product of oil recovery and a secondary source of energy. In the future, as gas features as a major source of energy, and its production is increasingly independent of that of oil, we expect the European Union gas market to reflect a global trend and to move towards gas-to-gas competition. One witness suggested (Q 34) that were the European Union to break the link with oil and introduce gas-on-gas competition in a fully liberalised market, this would have the effect of lowering prices throughout the European Union. But another witness (Q 65) dismissed this by saying that he doubted that breaking the link with oil would actually achieve this, that if one looked historically at the relationship between the two, they tended to move in parallel. The Committee noted, however, that the world’s largest gas market, that in the United States of America, operated on the basis of gas-to-gas competition.
substantial supply of LNG from the Middle East and Asia to Japan. And China and India are important developing areas of demand. The global nature of LNG combined with the rising importance of gas could, we believe, lead eventually to a world market gas price (Q 334). This would have consequences for both the European Union and the United Kingdom.

The Future of Gas Supply

124. In short, we foresee adequate average supplies of gas for the European Union and the United Kingdom to the end of this decade. We expect similar security in the period up to, say, 2025. This period will, we believe, be characterised by increasing volatility in the markets, sharpening international competition for gas, and rising gas prices. We are less certain of the picture thereafter. There will come a point, probably after 2020, when the level of gas prices may change the balance of factors driving investment decisions in energy sources. We expect that the United Kingdom in particular will remain vulnerable to a low probability/high impact shock for most of this period.

Our recommendations are:

Accessibility: The Liberalisation of the European Union Gas Market

125. We recommend that the Government urge the Commission to carry out a review in 2006 in order to promote rapid and common implementation of the Directive. (Para 38)

126. We welcome the action that the European Commission has taken in introducing the Second Internal Market Gas Directive and in proposing a Regulation governing Third Party Access. (Para 41)

127. Member States should be discouraged from protecting national energy champions when the thrust of European Union legislation is to create a common, pan-European market in gas. Economic forces are moving in the direction of global markets for gas and the European Union’s Lisbon Agenda seeks competitive energy markets to help the global competitiveness of the European Union economy. (Para 42)

128. We are concerned that Member State Regulators have to strike the right balance to sustain major investment decisions that may well have an effect on other Member States. For example, a major infrastructure decision in the centre of the European landmass will undoubtedly affect the energy policies of adjacent Member States. We see it as the Commission’s role to encourage a commonality of approach by the individual Member State Regulators. (Para 43)

129. We recommend that the Government support the European Commission in its promotion of full liberalisation of the energy markets, and especially, the gas markets. (Para 44)

130. We urge the Government to be supportive of the Commission in its oversight and monitoring of the implementation of the Directive and the Regulation. (Para 45)

Availability: Security of Supply and Investment

131. We recommend that the Government review its current estimates of future world demand to see how these figures compare with the IEA’s revised
estimates and to examine what effect a rapidly increasing global demand will have on the availability of gas and on prices. (Para 60)

132. It will be vitally important for the decisions of all European Member States’ Regulators to be transparent and to be seen to be even-handed. As individual Member States implement the Directive and establish Regulators where these do not exist already, there may well be notable differences between the powers the different Regulators enjoy. In turn, this will affect the nature of the decisions they are able to make and, where cross-border investments are concerned, such diversity of regulation could cause difficulty. Over time, the European gas pipeline system will become a more integrated and unified system, and existing price differentials will erode. We welcome the European Commission’s foresight in introducing the proposed Regulation on Third Party Access as an important step towards the creation of a unified market in Europe. We recommend that the Commission and Member States consider clearly how regulation of these important markets is to evolve, and that the many detailed questions relating to the commercial and operational aspects of its implementation are addressed as soon as possible. (Para 81)

Low Probability/High Impact Shocks

133. We recommend that the Government review existing regulations to examine the possibility of introducing fast-track reconnection practices for emergencies. (Para 93)

134. We are disturbed by the very low storage capacity available to the United Kingdom during this period. While we would not go so far as to recommend an increase in storage approaching that of continental Member States—on the grounds that after 2007 a sufficient diversification of supply would in itself provide a measure of insurance to cover such shocks—nevertheless, we do see a case for the Government to look urgently at the measures needed to protect consumers as the United Kingdom market ceases to enjoy the security of ample production capacity from the United Kingdom offshore fields close to the market. (Para 99)

135. The Regulator should be required to recognise the importance of peak coverage when dealing with investment decisions. This should also extend to issues such as connecting the proposed liquefied natural gas (LNG) terminals to the existing pipeline system in such a way as to ensure that these links are sized to handle extensive peak demand in winter. (Para 102)

136. We acknowledge the Minister’s answer to be finely judged. But we remain uneasy and therefore recommend that the Government review, as a matter of urgency, the projected demand for the next two to three winters in the light of increased global demand for gas and the ability of United Kingdom supply companies to access gas from the continental pipeline system, and in the market itself, the scope to realise demand-side flexibility in the balancing of supply and demand. (Para 107)

137. Clearly if there were, for example, a terrorist attack on either of the two existing terminals at St Fergus in Scotland and Bacton in Norfolk, then this could produce a national emergency for which the Government would have to assume immediate responsibility. The Committee, however, was in no position to judge whether this would produce the dire result which, on the face of it, might appear; the gas infrastructure has considerable redundancy
built into it to ensure a continuous supply to customers. We would welcome the Government’s assurances on this. (Para 110)

138. For Ofgem, with its unrivalled success in promoting and facilitating the gas and electricity privatisation, the dilemma is how to frame Britain’s fully liberalised gas and electricity markets so as to serve these wider policy objectives without at the same time compromising the dynamic of the market and blunting the incentives, responsibilities and liabilities of the participants in it\(^\text{67}\). The difficulty for both Ofgem and the Government will lie in resolving this dilemma now that the British gas market is moving from self-sufficiency towards growing dependence on access to continental infrastructure, when the continental interpretation of market liberalisation is more limited than that of the United Kingdom and when, in any case, a fully liberalised European gas market is probably still years away from realisation. We would welcome the Government’s view on how this situation might be addressed. (Para 111)

139. We conclude that there is considerable, if unquantifiable risk, particularly short-term, to the United Kingdom gas supply system and we urge the Government to review its emergency procedures for handling a sudden and major loss of gas. (Para 112)

**Recommendation to the House**

140. The European Union’s Second Internal Market Gas Directive and the proposed Regulation Third Party Access raise important issues of policy to which the attention of the House should be drawn, and we therefore recommend this report for debate.

\(^{67}\) A similar warning about building up storage capacity was made by Gastransport Services in written evidence, p 99
APPENDIX 1: SUB-COMMITTEE B (INTERNAL MARKET)

The Members of the Sub-Committee were:

Baroness Cohen of Pimlico
Baroness Eccles of Moulton
Lord Fearn
Lord Geddes
Lord Haskel
Lord Shutt of Greetland
Lord St John of Bletso
Lord Swinfen
Lord Walpole
Lord Woolmer of Leeds (Chairman)

Mr John Wybrew was appointed as Specialist Adviser for the inquiry

Declarations of Interest:

Baroness Cohen of Pimlico
Non-executive Director, LSE plc (London Stock Exchange)
Non-executive Director, Defence Logistics Organisation (Ministry of Defence)

Baroness Eccles of Moulton
Director, Times Newspapers Holdings Ltd

Lord St John of Bletso
Consultant to Merrill Lynch (Europe), 1992–
(Past oil analyst, specialisation on emerging markets, particularly Africa)
Non-executive Director, Regal Petroleum plc 2003–
(Exploration and production facilities in Greece, Ukraine and Romania)
Consultant to Globix Europe

Lord Woolmer of Leeds
Chair, Regional Energy Forum of The Yorkshire & Humber Regional Agency
APPENDIX 2: CALL FOR EVIDENCE

Sub-Committee B (Internal Market) of the House of Lords Select Committee on the European Union is undertaking an inquiry into issues raised by the European Commission’s Communication of 26 May 2003 that examined the development of energy policy for the enlarged European Union, its neighbours and partner countries; the proposed Directive on Gas Security of Supply; the Communication of 17 December 2003 on energy infrastructure and security of supply; and the proposed Regulation on conditions for access to the gas transmission networks. Evidence is invited on the outlook for the availability and accessibility of gas supply within the European Union and Member States, and on the adequacy of existing Community and Member States’ policies in this regard.

In addition to the evidence on these issues, the inquiry also seeks evidence on the following questions:

AVAILABILITY AND SECURITY OF SUPPLY

(1) Is there a threat, real or latent, to security of gas supply to and within the European Union? What policy issues arise from risks to security of supply? Are current policies adequate?

(2) What forms of diversification of gas sources of supply are feasible and affordable, and over what period of time?

(3) Is it possible or desirable to create safeguards and pooled reserves to cover unexpected temporary, part or complete, interruption in the delivery of gas supplies to the European Union, within an international gas market, and similar to those measures that obtain in the international oil market?

(4) What impact does the changing nature of gas production have on the availability of gas supply from the United Kingdom’s gas and oil fields?

ACCESSIBILITY AND THE OPERATION OF A FULLY LIBERALISED MARKET

(5) Is there a genuine pan-European Union gas pipeline infrastructure currently accessible, commercially and operationally, to all customers at all times?

(6) What constraints does the European Union energy market place on the timeliness of investment in the distribution infrastructure and in gas-fired generating capacity?

(7) Would a fully-liberalised internal European Union market remove these constraints?

(8) Are the markets alone able to deal with low probability/high impact events or is there a need for intervention or direction at Union and/or Member State level?

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APPENDIX 3: LIST OF WITNESSES

The following witnesses gave evidence. Those marked * gave oral evidence.

Association of Electricity Producers
Sir Hermann Bondi KCB, FRS
British Geological Survey
* BP plc
* Centrica plc
* Department of Trade and Industry
* The Rt Hon Tim Eggar
ENI S.p.A, Gas and Power Division
Eurogas
* European Commission
ExxonMobil International Limited
Gas Natural SDG S.A.
Gastransport Services
Interconnector (UK) Limited
International Energy Agency (part of OECD)
Sir Donald Miller FRSE, FREng
Ministry of Defence (in conjunction with Department of Trade and Industry)
National Grid Transco
* The Office of Gas and Electricity Markets (Ofgem)
Powergen
* Ruhrgas
Shell UK
Statoil ASA
* Dr Jonathan Stern, The Oxford Institute for Energy Studies
UK Offshore Operator Association (UKOOA)
APPENDIX 4: PAPER BY MR ALEX WILSON, EUROPEAN COMMITTEE RESEARCHER, HOUSE OF LORDS


This note aims to provide a synthesis of the 2003 Gas Directive, explain its key features as well as important derogations or limitations which would impact on the effectiveness of an Internal Market in Gas.

Background
The Directive was formulated as part of the Lisbon European Council demand for liberalisation of the electricity and gas sector (March 2000), and to the European Parliament Resolution (6 July 2000) requesting to the Commission to adopt a detailed timetable to achieving a liberalised energy market.

Reasoning
The experience of the 1998 Directive 98/30/EC indicated significant shortcomings in the internal market for Gas. Provisions are therefore necessary to ensure a level playing field, to reduce the risk of market dominance and to ensure non-discriminatory transmission and distribution tariffs. This is to be done in a manner that takes into account security of supply, environmental and consumer protection. This Directive establishes common rules for the transmission, distribution, storage and supply of natural gas and lays down the rules on market access and the criteria and procedures to be fulfilled in order to achieve that.

Implementation (Article 33)
Member States are required to bring into force laws, regulations and administrative provisions to fulfil the demands of this Directive by 1 July 2004. The implementation of this Directive leads to the repeal of the previous Gas Directives 91/296/EEC and 98/30/EC with effect from 1 July 2004.

Authorisation Procedure (Article 4)
In cases where authorisation is required to construct or operate natural gas facilities, these should be done on objective and non-discriminatory criteria. These should be made public, and reasons for refusal known to the applicant. Reasons for refusal should be notified to the European Commission, and Member States shall establish an appeals procedure. Member States can decline to grant further authorisations in an area where pipelines have been or are proposed to be built.

Unbundling of transmission system operators (Article 9)
Transmission system operators (TSO’s) must be made independent from other activities not relating to transmission (production, storage and distribution) in a legal, organisational and decision-making capacity. This does not create an obligation to separate the ownership of assets of the transmission system from the other operations. Instead, those persons responsible for management of the TSO’s may not participate or have a conflict of interests with the company structures
responsible for the day-to-day operation of the production, distribution and supply of gas, or decisions concerning construction/upgrading. However, co-ordination mechanisms are to be allowed to ensure the parent company can approve the annual financial plan or set the level of its subsidiaries’ indebtedness. TSO’s must observe strict rules of confidentiality for any commercially sensitive information obtained on third parties in the context of providing or negotiating system access.

Unbundling of distribution system operators (Article 13)
The rules listed above with regard to unbundling and confidentiality of transmission system operators are to be applied equally to distribution system operators.

Unbundling and transparency of accounts (Articles 16/17)
Member States or their regulatory authorities or dispute settlement authorities can have access to the accounts of natural gas undertakings but must guarantee to preserve their confidentiality. Natural gas undertakings must keep separate accounts for transmission, distribution, storage and other activities with a view to avoiding discrimination, cross-subsidisation and distortion of competition.

Third Party Access (Articles 18-20)
Member States are to ensure third party access to the distribution and transmission system on the basis of published tariffs applied objectively. This does not prevent the conclusion of long-term contracts in so far as they comply with EU competition rules. As regards access to storage, this can either be done on the basis of published tariffs (“regulated access”) or by contractual agreement with the operator (“negotiated access”) who must publish their commercial conditions for use of storage within 6 months of this Directive (2/2005) and annually thereafter. Access to upstream pipeline networks is to be guaranteed by an independent dispute settlement authority. In the event of cross-border disputes, the dispute settlement for the Member State having jurisdiction over the upstream pipeline network which refuses access shall be applied.

Refusal of Access (Article 21)
This can only be applied on the basis of a lack of capacity, where access to the system would prevent the natural gas undertakings carrying out their public service obligations, or if there would be serious economic difficulties with take-or-pay contracts. With regard to access to upstream pipeline networks, refusal of access could also be granted on the grounds of technical specification problems, marginal economic viability, or the reasonable needs of the owner and current system users.

New infrastructure (Article 22)
Major new gas infrastructures may be exempt from third party access requirements only if their investment enhances competition in gas supply; increases security of supply; the level of risk requires an exemption from third party access; the infrastructure is owned by a legally distinct operator; charges are levied on users of the infrastructure; and the exemption is not generally detrimental to competition in the internal gas market. The same rules apply to significant increases in capacity in existing infrastructures and to modifications which enable new gas source supplies. The exemption decision must be notified to the European Commission.
without delay and it may (within 2-3 months) request that the regulatory authority or Member State withdraw the exemption decision.

**Market Opening and Reciprocity (Article 23)**

This Directive applies to all non-household customers from the date of implementation (1 July 2004) and to all customers from 1 July 2007.

**Regulatory Authorities (Article 25)**

Member States must designate one or more competent bodies with the function of regulatory authorities. These authorities shall be wholly independent of the interests of the gas industry and be responsible for ensuring non-discrimination, effective competition and efficient functioning of the market, in particular through monitoring. They shall establish the methodologies for calculating access tariffs, and act as dispute settlement authorities issuing a decision within 2-4 months.

**Derogations and Take-or-pay commitments (Article 27)**

A temporary derogation from Third Party Access requirements may be granted by the regulatory authority if a natural gas undertaking encounters serious economic and financial difficulties due to take-or-pay commitments. Any refusal of access must be notified to the European Commission and within eight weeks it may request the authority to amend or withdraw the derogation. Within five years of the entry to force of this Directive (2008), the commission shall submit a review report to allow the Parliament and Council to consider any adjustments necessary to this Article. A number of derogations are possible in the case of emergent or isolated markets and these are specifically listed in Article 28.

**Reporting (Article 31)**

The European Commission shall submit an overall progress report to the Council and the Parliament by the end of 2005 and thereafter on an annual basis. Every 2 years this report will consider measures taken by Member States to meet public service obligations and whether these have been effective or have hindered the competition in the gas market. By 1 January 2006, the Commission shall present a detailed report outlining progress in creating an internal gas market, in particular to ensure full and effective independence of distribution systems has been achieved by 1 July 2007.

**European Regulators Group**

The Commission intends to establish a European Regulators Group for Electricity and Gas which would create an advisory mechanism to ensure co-operation, co-ordination and consistent application of electricity and gas Directives and Regulations.

**Commission’s proposal for a Regulation of the European Parliament and of the Council on conditions for access to the gas transmission networks (10/12/2003)**

The proposed Regulation would come under the framework of the 2003 Gas Directive. It would involve additional measures necessary to ensure that the objectives of the 2003 Gas Directive were met. In particular, this proposed Regulation would deal with the issue of common tariff structures required by the 2003 Gas Directive.
It proposes using the European Gas Regulatory Forum’s (EGRF) “Guidelines for Good Third Party Access Practice” agreed by the Commission, Member States and national regulatory authorities at a meeting in Madrid in February 2002. It asserts that detailed work needs to be done on the issue of contractual congestion management (“use it or lose it rules”) and decisions should be implemented through the “regulatory comitology” procedure. It also proposes the implementation of the second set of “Guidelines for Good TPA Practice” agreed at the September 2003 EGRF meeting.
## APPENDIX 5: GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</table>
| **Allocation**                | 1. Any process by which entry capacity or NTS (see below) exit capacity may be allocated by or on behalf of Transco in accordance with the Network Code  
2. An end-of-day process whereby Transco (and Claims Validation Agents) allocate actual gas flows to each shipper’s account |
<p>| <strong>Annual Monthly System Entry Capacity (AMSEC)</strong> | Monthly capacity to be offered in annual auctions, typically in February for the following April to March |
| <strong>Arbitrage</strong>                 | The practice of exploiting price differentials between different markets, products or locations |
| <strong>Basis</strong>                     | The price differential between different markets, products or locations |
| <strong>Bcm</strong>                       | Billion cubic metres |
| <strong>Booked capacity</strong>           | Any capacity that a shipper buys from a pipeline company |
| <strong>British thermal unit</strong>      | The heat required to raise the temperature of 1 lb of water by 10°F at or near 39.2°F |
| <strong>Calorific value</strong>           | The energy in megajoules produced by the combustion of 1 cu metre of gas |
| <strong>Cal</strong>                       | Calorific |
| <strong>(High-cal, Low-cal)</strong>       | High calorific, Low calorific |
| <strong>Capacity</strong>                  | The amount of gas that can be held within the physical structures (Pipelines and storage facilities) |
| <strong>Capacity (entry)</strong>          | The amount of gas that a shipper is entitled to put into the system at a particular input point (terminal) on a day |
| <strong>Capacity trading</strong>          | The process by which shippers with spare capacity sell it to other shippers, who require more capacity through a process of offers and bids |
| <strong>Claims Validation</strong>         | The process whereby gas is allocated to shippers at an entry point. The Claims Validation Agent is an independent body, set up and funded by the industry, to manage this process |
| <strong>Commodity charge</strong>          | A charge in respect of the use of the system determined by the quantity of gas flow at a certain point |
| <strong>Constraint management services</strong> | Services in relation to the management of capacity rights by Transco in order to maintain system pressures within safe limits |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily balancing</td>
<td>Shipper inputs and outputs are balanced at the end of each gas flow day, and the appropriate imbalance charges re-calculated</td>
</tr>
<tr>
<td>Daily Interruptible System Entry Capacity (DSEC)</td>
<td>Interruptible capacity offered by Transco before the day</td>
</tr>
<tr>
<td>Daily flow notifications (DFNs)</td>
<td>Hourly flow rates at each beach sub-terminal submitted to Transco by sub-terminal operators</td>
</tr>
<tr>
<td>Daily-metered (DM) customers</td>
<td>Large or interruptible customers whose daily gas consumption is measured and transmitted to shippers or Transco, typically through a datalogger</td>
</tr>
<tr>
<td>Daily System Entry Capacity (DSEC)</td>
<td>Firm capacity offered by Transco before or on the day</td>
</tr>
<tr>
<td>Deliverability</td>
<td>The maximum quantity of gas that can be withdrawn from a storage facility on a single day. Also referred to as withdrawal (capacity)</td>
</tr>
<tr>
<td>Entry point</td>
<td>The point at which gas enters the gas transportation system. This could be a sub-terminal, storage facility or onshore field</td>
</tr>
<tr>
<td>EASEE</td>
<td>European Association for the Streamlining of Energy Exchange</td>
</tr>
<tr>
<td>EEA</td>
<td>European Economic Area</td>
</tr>
<tr>
<td>Exit Zone</td>
<td>A geographical gas distribution area (wholly contained within an LDZ – see below) that groups together supply points, which, on a peak day, receive gas from a specified NTS offtake point and therefore attract the same exit capacity charge</td>
</tr>
<tr>
<td>Firm entry capacity</td>
<td>Entry capacity right that gives the holder a firm right either to flow gas or to receive compensation from Transco</td>
</tr>
<tr>
<td>The Gas and Electricity Markets Authority (GEMA)</td>
<td>The main onshore gas (and electricity) regulator in Britain. GEMA is in effect the executive board of Ofgem</td>
</tr>
<tr>
<td>Gigawatt hour (GWh)</td>
<td>One million kilowatt hours</td>
</tr>
<tr>
<td>GTL</td>
<td>Gas to Liquids</td>
</tr>
<tr>
<td>GSIB</td>
<td>European Gas Standards Industry Board</td>
</tr>
<tr>
<td>Imbalance</td>
<td>The difference between the quantity of gas delivered to the system by a shipper and the quantity delivered to the shipper’s customers</td>
</tr>
<tr>
<td>Incremental annual obligated entry capacity (IAOEC)</td>
<td>Any obligated entry capacity in respect of a given terminal which Transco is required to offer for sale for a period of less than five years. This is additional capacity above baseline that Ofgem approves Transco’s releases to the market</td>
</tr>
<tr>
<td>Incremental entry capacity</td>
<td>Capacity that Transco releases to the market above SO (see below) baseline.</td>
</tr>
<tr>
<td><strong>Incremental entry capacity services</strong></td>
<td>The undertaking of engagements relating to the provision of entry capacity other than NTS SO Baseline entry capacity</td>
</tr>
<tr>
<td><strong>Incremental obligated entry capacity</strong></td>
<td>Firm entry capacity in excess of NTS SO Baseline entry capacity which Transco is required to offer for sale</td>
</tr>
<tr>
<td><strong>Incremental permanent obligated entry capacity (IPOEC)</strong></td>
<td>Any obligated incremental entry capacity in respect of a given terminal which Transco is required to offer for sale for a period of five years or more</td>
</tr>
<tr>
<td><strong>IEA</strong></td>
<td>International Energy Agency</td>
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<tr>
<td><strong>IGM</strong></td>
<td>Internal Gas market</td>
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<tr>
<td><strong>Interruptible customer</strong></td>
<td>A customer whose supply may be interrupted, either by Transco for system security reasons, or in some cases, by shippers for commercial reasons</td>
</tr>
<tr>
<td><strong>Interruptible entry capacity</strong></td>
<td>Entry capacity that gives the holder an interruptible right to flow gas into the system</td>
</tr>
<tr>
<td><strong>JESS</strong></td>
<td>Joint Energy Security of Supply Working Group (a joint Department of Trade and Industry/Ofgem monitoring group)</td>
</tr>
<tr>
<td><strong>Kilowatt hour (kWh)</strong></td>
<td>3,600,000 Joules</td>
</tr>
<tr>
<td><strong>Liquefied natural gas (LNG)</strong></td>
<td>Gas cooled until it becomes liquid (-162°C), and stored in insulated metal tanks</td>
</tr>
<tr>
<td><strong>LDZ network</strong></td>
<td>The aggregate of the Local Distribution Zones</td>
</tr>
<tr>
<td><strong>Long-term baseline entry capacity (LBEC)</strong></td>
<td>The amount of capacity that Transco is obliged to offer for sale in the long-term auctions, currently set at 80 per cent of SO baseline</td>
</tr>
<tr>
<td><strong>Long-term marginal costs (LRMC)</strong></td>
<td>A system for calculating the cost of increasing transportation capacity used to allocate capacity charges (or reserve prices) between different entry and exit points</td>
</tr>
<tr>
<td><strong>Long-term system Entry Capacity (LTSEC)</strong></td>
<td>Capacity that is offered by Transco in annual auctions for years 3 to 15</td>
</tr>
<tr>
<td><strong>Monthly System Entry Capacity (MSEC)</strong></td>
<td>Capacity offered by Transco for years 1 and 2, in monthly bundles</td>
</tr>
<tr>
<td><strong>National balancing point (NBP)</strong></td>
<td>An imaginary point on the United Kingdom gas supply system through which all gas passes in accounting and balancing terms</td>
</tr>
<tr>
<td><strong>NCS</strong></td>
<td>Norwegian Continental Shelf</td>
</tr>
<tr>
<td><strong>National transmission system (NTS)</strong></td>
<td>The high pressure network of pipes that transports the gas between the terminals, storage facilities and specific regional sites for local distribution in the United Kingdom</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<td>-----------------------------------------------------</td>
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<tr>
<td>Network Code</td>
<td>A set of business rules within a legal framework that defines the rights and obligations of Transco and shippers, and forms the basis for all contracts between them</td>
</tr>
<tr>
<td>Nomination</td>
<td>A request for Transco to receive or deliver gas to, or from, its system</td>
</tr>
<tr>
<td>Non-daily metered (NDM) customers</td>
<td>All customers that do not have a daily meter-reading facility</td>
</tr>
<tr>
<td>Non-obligated incremental entry capacity</td>
<td>Firm entry capacity other than obligated entry capacity. This is additional capacity that Transco may choose to release to the market, without requiring Ofgem approval</td>
</tr>
<tr>
<td>NTS system operator (SO) revenue</td>
<td>Revenue derived by Transco from carrying out NTS SO activity</td>
</tr>
<tr>
<td>NTS transportation asset owner (TO) activity</td>
<td>The activities of Transco connected with the development, administration and maintenance of the NTS and with the supply of all NTS services</td>
</tr>
<tr>
<td>NTS</td>
<td>National Transmission System</td>
</tr>
<tr>
<td>Obligated entry capacity</td>
<td>Obligated incremental entry capacity and NTS SO Baseline entry capacity</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
</tr>
<tr>
<td>Ofgem</td>
<td>Office of Gas and Electricity markets (the United Kingdom regulator for both gas and electricity, previously separate as Ofgas and Offer). Ofgem is the office the Gas and Electricity Markets Authority (GEMA)</td>
</tr>
<tr>
<td>On-the-day commodity market</td>
<td>A screen-based trading system to allow gas trading within a day</td>
</tr>
<tr>
<td>OPEC</td>
<td>Organisation of Petroleum Exporting Countries</td>
</tr>
<tr>
<td>Producer</td>
<td>Company which explores for gas, drills the wells, and flows the gas from the sea bed. It sends the gas along undersea pipelines and hands it over to terminal operators</td>
</tr>
<tr>
<td>Quarterly System Entry Capacity (QSEC)</td>
<td>Entry capacity in quarterly bundles offered by Transco in the long-term auctions</td>
</tr>
<tr>
<td>Rolling Monthly System Entry Capacity (RMSEC)</td>
<td>Unsold MSEC offered by Transco just before the start of the relevant month</td>
</tr>
<tr>
<td>Scheduling</td>
<td>The (initially day-ahead) process whereby Transco decides how to manage gas flows on its system in order to meet demand</td>
</tr>
<tr>
<td>Scheduling charges</td>
<td>Charges levied on shippers based on differences between their end-of-day nominated and allocated volumes</td>
</tr>
<tr>
<td>Seasonal normal demand (SND)</td>
<td>Forecast demand based on seasonal normal temperatures</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Seasonal normal temperature</td>
<td>The average temperature that might be expected on any particular day, based on historical data</td>
</tr>
<tr>
<td>Shipper</td>
<td>A company that contracts with the pipeline company for the use of transportation and storage facilities</td>
</tr>
<tr>
<td>Short-term baseline entry capacity (SBEC)</td>
<td>The amount of SO baseline capacity that Transco is obliged to withhold from long-term auctions in order to offer for sale in the short-term auctions, currently set at 20 per cent of SO baseline</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>Gas losses in the transportation and distribution system. Shrinkage gas is either own use gas (gas used by Transco in operating its system, eg as compression fuel) or unaccounted for gas (leaks and theft)</td>
</tr>
<tr>
<td>Supplier</td>
<td>A party licensed by Ofgem to sell gas to end-users</td>
</tr>
<tr>
<td>Supply point</td>
<td>The metered point where gas is supplied from the pipeline system to the end-user. May include multiple meter points</td>
</tr>
<tr>
<td>Supply point administration (SPA)</td>
<td>The process hereby supply points are registered to particular shippers and suppliers, and transferred between parties</td>
</tr>
<tr>
<td>System Operator (SO)</td>
<td>The body that manages the operation of the system from day-to-day – part of Transco’s role in Britain</td>
</tr>
<tr>
<td>SO Baseline entry capacity</td>
<td>The minimum amount of capacity that Transco is required to offer for sale at a particular entry point</td>
</tr>
<tr>
<td>System</td>
<td>The pipeline system operated by the pipeline company for the conveyance of gas</td>
</tr>
<tr>
<td>System management services</td>
<td>Services in relation to the balancing of gas inputs to, and gas offtakes from, the NTS and includes balancing trades and balancing trade derivatives and constraint management services</td>
</tr>
<tr>
<td>TBE</td>
<td>Transporting Britain’s Energy (formerly known as Base Plan Assumptions)</td>
</tr>
<tr>
<td>Terminal flow advice (TFA)</td>
<td>Also referred to as a transportation flow advice. A request from Transco to a sub-terminal operator to reduce gas flows into a particular terminal</td>
</tr>
<tr>
<td>TOP</td>
<td>Take-or-Pay (Agreements)</td>
</tr>
<tr>
<td>TPA</td>
<td>Third Party Access</td>
</tr>
<tr>
<td>Top-up manager</td>
<td>The body (currently Transco) that ensures that the industry has sufficient gas placed in storage to meet firm demand under severe weather conditions. If sufficient gas is placed in storage, the top-up manager may buy additional gas to store in order to meet supply security</td>
</tr>
<tr>
<td>Transmission Asset Owner (TO)</td>
<td>The body that owns the transportation system, and is responsible for its long-term maintenance and development – part of Transco’s role in Britain</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TSOs</td>
<td>Transmission System Operators</td>
</tr>
<tr>
<td>UKCS</td>
<td>United Kingdom Continental Shelf</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organisation</td>
</tr>
</tbody>
</table>
European Gas Transmission Networks

pipelines/
LNG receiving terminals

existing
planned
or under
construction

2000

Transco
Potential New Gas Supplies

Vesterled 10 bcm/y, FLAGS 2007+ 4bcm/y,

Langaled pipeline from 06/07
Ormen Lange
15-25 bcm/y, 07/08

Dutch Interconnector
8-15 bcm/y, 2006/07

Zeebrugge & Compression
8-24 bcm/y, 2005/06

Isle of Grain
4 -15 bcm, 2005

Source: NGT 10 Year Statement