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## CONSULTATION ON THE REVIEW OF STRATEGIC ISSUES SURROUNDING ENERGY POLICY

A Representation by Enron Europe to the Performance & Innovation Unit of the Cabinet Office  
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### INTRODUCTION AND EXECUTIVE SUMMARY

Given current technology, it is unlikely that there will be a single fuel that dominates UK energy policy over the next 50 years. A range of concerns about environmental pollution from fossil fuels, about nuclear safety, about inadequacy of renewable technologies to provide large scale supplies, and about political risks associated with the importation of primary fuels suggest the limitations of each fuel type. The UK is therefore best advised to pursue a diversified approach, thereby limiting the risks associated within any individual product.

Diversity is also of benefit within as well as across products. A mix of long, medium and short term contracts for gas, oil, coal or electricity can both provide the necessary long term price signals for investment and the short term flexibility to maximise efficiency in production, transportation and use. The opportunity to source fuels from multiple countries reduces the political risk associated with any particular region. A range of contract terms will allow counter parties to manage risks internally in the ways best suited to their shareholders, lenders and customers.

While these benefits are best delivered under competitive market conditions, as has been achieved in the UK energy sector, a lack of progress in European energy markets has prevented UK consumers from enjoying the maximum benefits of liberalisation. The self-interest of national incumbent utilities is preventing further efficiency gains being driven out of European networks. This is to the detriment of European consumers, particularly large energy users in internationally competitive industries.

In the course of this paper, we demonstrate that:

- further liberalisation is in the best interests of the UK and Europe
- advocacy and guidance from UK authorities will be essential to ensure that competitive markets develop in a reasonable timeframe
- the market ensures that the level of security of supply desired by consumers is most economically provided in a competitive market
- that there remains an important diplomatic role for governments in identifying and managing exposure from political risk outside the EU

The PIU also places emphasis on demand side solutions to managing energy risk. Market-based prices under competition will provide the best economic signals to consumers to manage demand, invest in efficiency measures and send signals to their consumers through accurate pricing of energy-using products and services.



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Above all, the UK government can best provide a stable, predictable regulatory framework to allow market participants to respond to economic signals.

## **1 ENRON'S ACTIVITIES, SPANNING THE LENGTH OF THE SUPPLY CHAIN**

Enron began operations in the UK in 1989. Our activities consist of upstream gas processing, transportation and shipping to the National Balancing Point (NBP). We part-own and operate the world's largest privately owned CCGT combined heat and power plant, the 1875 MW Teesside power station, as well as other generating assets. Enron's primary focus in the UK is as an energy trader and provider of risk management services. Enron's web-based trading platform, 'Enron Online' is the world's largest e-business site, trading the majority of UK term-traded power volumes. In addition, Enron offers retail services through Enron Energy Services, comprising supply, energy outsourcing, and the management of energy commodities, equipment, information, facilities and capital. Our licensed supply businesses serve over 175,000 industrial and commercial customers with power and gas.

Across continental Europe, Enron has principal offices in Amsterdam, Brussels, Frankfurt, Madrid, Milan, Oslo, Warsaw, Stockholm and Zurich. We are a leading participant in the liberalised Nordic energy market and the leading new entrant in the continental European energy markets. Natural gas and electricity marketing and supply businesses are supported by power stations in development, owned and/or operated by Enron in Italy, Poland, Spain and Turkey.

## **2 ENRON'S RESPONSES TO SPECIFIC QUESTIONS**

### **2.1 What are the implications for the UK energy markets of the move towards greater European market liberalisation?**

Since the Bacton-Zeebrugge gas interconnector opened in 1998, the UK gas market (and therefore power market) has been closely linked with the European gas market. Sustained high oil prices have raised the price of gas in Europe due to their long-term contracts being indexed to oil. In the UK, liberalisation had largely broken the oil price linkage in spot markets as most gas was traded under short-term contracts. The interconnector, however, allowed UK gas producers to sell into higher priced European markets, driving UK wholesale prices up towards European levels. Further liberalisation in Europe would break the linkage of energy prices to oil price.

The European Commission has begun investigations into a number of countries that have contracted to buy gas in excess of their national demand. As a liberalised market will expose oversupply and drive down the value of their holdings, the affected companies have a vested interest in maintaining the current market structure to sustain prices above levels that would truly reflect supply/demand fundamentals.

Action by the UK Government in the following areas would contribute to the development of competitive markets in the EU:

- Promotion of wholesale markets, for example through trading hubs. This creates price transparency, on which financial risk management products can be developed. It provides a market location for access to multiple counter parties to trade out over or undersupplies. It allows standard trading conditions to be developed to reduce transaction costs. It facilitates market entry and exit, particularly by non-vertically integrated undertakings. It helps the promotion of retail competition.
- Further retail competition should be developed on the continent. This could be achieved quantitatively as is suggested by the proposed acceleration directives. However, restrictive terms of access to gas and electricity networks on the continent means that the level of customer choice is much less than is legally possible. Negotiated third party access is allowing vertically integrated undertakings to set prohibitively high prices for incomplete services for access to networks by competing supply companies. A lack of unbundling maintains the incentives to do so and the difficulties of detection. Point-to-point gas transportation services and excessively tight balancing obligations restrict flexibility and artificially exaggerate the benefits of having a large portfolio of customers (i.e. favouring incumbents). Regulated access by transmission companies that are unbundled from their supply arms will reduce the potential for anti-competitive behaviour.
- It is normal to find that incumbents retain exclusive information relating to the network and its demand patterns from their days as monopoly franchises. The availability of network constraint information and flow information, as well as likely future demand information is crucial for entrants to be able to invest in assets or compete directly with incumbents in the retail market. Information provision to new entrants should be on the same basis as that available to incumbents. In many instances, new entrants are able to offer more competitive prices due to their greater commercial focus.
- Large sector-specific incumbents are increasingly consolidating to form larger energy incumbents. A reduction in the number of suppliers on the continent will only serve to reduce competition and act to create a more concentrated market – exactly the opposite of what is required for achieving wholesale competition and cost-reflective prices. Recent examples are the mergers between Veba/VIAG, RWE/VEW, cross-shareholdings by Vattefall in Veag, HEW and Bewag, between EdF and Hidrocantabrico and EnBW, EdF's acquisitions of London Electricity and Yorkshire electricity, and E.ON's proposal to increase its shareholdings in Ruhrgas through a deal with BP. Recent capacity swaps, between the dominant players in different markets, under the guise of 'competitive' auctions are a worrying trend. These actions serve to cement incumbent interests across the continent by ensuring that incumbents entering each other's markets behave in the manner that they would expect the other to behave in their own market.

It is vital that the UK Government puts considerable effort into the development of the European market. The benefits of effective competition in the UK should not be undermined by slower rates of liberalisation across the rest of the EU.

## **2.2 What is the appropriate balance between market-based and more ‘political’ approaches to security?**

Much of the debate on security of supply stems from confusion about the different roles for security. The use of strategic stockpiles or diversification policy to address risks posed by OPEC determining oil prices or trade embargoes would appropriately be addressed by EU or national policymakers. Costs should be made transparent and socialised. However, the competitive market provides the best means to meet such requirements efficiently and economically. These policies should not be an excuse for covert deals with preferred companies that have the result of distorting the wider market.

We must be careful to guard against examining issues of supply security through the lens of the historic business practices of the pre-liberalisation, incumbent firms. New entrants bring innovative contracting and business practices to the market that can address security concerns in more flexible ways than are likely to be brought by incumbent monopolies.

A competitive market whereby suppliers are able to offer choices of levels of supply security through contracts allows the consumers themselves to signal the value they place on supply security. An industrial customer in an internationally competitive market may prefer low prices that ensure the survival of his business today over the certainty of supplies in 50 years.

The primary role for government is to ensure that parties are able to respond to market signals.

- Markets fail when an economic solution in response to the supply-demand balance cannot be implemented due to external factors such as inefficient planning restrictions. Adequate capacity is ensured when the markets signal to developers, in the case of gas-fired generation for example, with a widening of the spread between forward gas and power prices. At this stage, generation capacity should be able to be built without suffering from inefficient processes. There is a clear need for the Government to simplify the consents process.
- The Government should minimise regulatory risk. This is important as the risk of incurring stranded assets acts as a strong disincentive to investing in long term fixed assets such as infrastructure and generation capacity. Government and regulatory actions should be transparent, so that regulatory uncertainty can be priced into projects. An example of opaque regulatory process is the ‘market abuse licence condition’ (MALC). The MALC gives the regulator undue discretion in deciding what does or does not constitute abusive behaviour. A MALC should have clear guidelines for its use, to impose a degree of certainty for projects or actions that could be susceptible to review under MALC.

### **2.3 What is the appropriate balance between emphasis on short-term physical elements of security and longer-term price elements, bearing in mind that, as we look further into the future, security seems increasingly to resemble long-term economic objectives?**

In an efficient and transparent market, the long-term forward spread between gas and power prices should provide a clear signal as to the value of investment in gas fired power generation. In such an example, it is crucial that longer-term price elements are credible. However, in markets where short-term market signals do not elicit appropriate responses, short-term physical constraints will be priced into longer-term markets.

An example of short-term constraints affecting long-term markets can be seen in the case of gas. Auctions for summer capacity at St. Fergus have resulted in over recovery of revenue of approximately £400 million. The over recovery suggests a level of constraint above that required by the market. In fact, build costs for the incremental capacity at St. Fergus are much lower than the market is prepared to value it at. The fact that this is not enough to spur investment suggests that the physical constraints will begin to affect the longer-term costs and ease of gas imports.

Energy markets are extremely susceptible to short-term physical failures. More important than the balance between short-term and long-term elements should be establishing a framework that facilitates market-led responses to physical constraints. Included in such a framework would be a simplified consent procedure for investment and low or manageable regulatory risk .

### **2.4 To what extent should we be concerned about importing a proportion of our energy needs? Where there is concern about security of supply from a particular set of overseas suppliers, how far should we be concerned with market power or with political unreliability?**

Enron's view is that except for certain extreme circumstances, such as war, the physical supplies of energy, if available in the ground, will not be disrupted. Indeed, throughout the cold war, physical supplies of gas from Russia were never at risk, and it is difficult to see why any state would want to disrupt its main source of hard currency. Any small risk of physical disruption, due to political unreliability, could be reduced by the development of a diverse portfolio of sources.

Security of supply is therefore more of an economic issue. An efficiently functioning market will determine a reasonable price for a particular fuel. With choice from a diverse set of supply sources, efficient markets encourage least cost procurement. As well as inter-fuel choice, it is important that choice is developed for sources within a fuel type. This optionality within fuel types has a high value for the market in terms of reductions in risk and promotion of inter-fuel competition.

In the case of gas, competition is important in ensuring delivery at prices that are deemed to be appropriate by the market as a whole. Gas prices on the continent are currently linked to oil prices. This is due to long-term contracts with Norway and Russia largely being indexed to oil prices. The

onset of effective gas-to-gas competition should make prices more reflective of supply/demand fundamentals and transportation costs, rather than oil prices set by a cartel of oil producing countries.

In the near term (out to 2010), sources in Norway, the Netherlands and the UK continental shelf provide gas at close proximity. However, regulatory uncertainty in the case of the Netherlands and insufficient entry capacity at St. Fergus in the case of Norway may move market prices above a cost perceived to be reasonable by the market. At this stage, other sources become important. In the longer-term, studies of lower-bound prices to sustain different sources forecast similar prices for gas from North Africa and new projects in Russia (both delivered to Zeebrugge). This indicates considerable scope for intra-fuel longer-term diversity, and therefore, competition.

The development of Liquid Natural Gas (LNG) would provide an important source of further diversification. Our research indicates that LNG would have a lower bound price at the high end of North African gas and at the lower end of some new Russian projects. The *full* value of the diversity provided by LNG could be exploited by the market if robust infrastructure were to be developed to support this flexibility.

Whilst sources compete to provide gas to the European network, it is important that the market for power should be able to compare the intra-gas competition with other fuel sources. In this form, robust infrastructure for delivering local and imported coal to the coal-fired power stations will maintain the inter-fuel competition. The added competition between sources of fuel will help bring down prices, and therefore, provide a secure source of energy supply in the long-term.

## **2.5 Are generic ideas like diversity, robustness and flexibility a useful starting point for analysis of the risks against which security policies are designed to protect?**

There is an asymmetry between the costs to the market due to the network being over-constrained and the costs in terms of the inefficiency involved with investment to the level that the network is under constrained. Typically, the costs of inadequate network provision place inordinately higher 'costs' on the market.

Physical capacity comes on-line a long time after the decision to invest. These investment lags, coupled with significant demand uncertainty, can result in periods of substantially extra constraint on an inflexible and constrained network. This can lead to high costs to the market due to these transitional periods of high constraint in the network.

In the longer-term, network flexibility is essential for the supply to be able to reach the demand in response to market signals. This leads to a value for having the option or flexibility within a network. The value derives from locational flexibility in the network and, in particular, the flexibility to substitute between different entry points and to change downstream supply strategies. For example, in the UK gas market, there is increasing evidence of reductions in supply

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of gas from the UK continental shelf. In practice, if the market prefers to import gas from Norway, it should be able to do so, rather than being constrained to use sources that it may not perceive to be as efficient. The diversification that would occur from the market determining the sources entails a greater need for flexibility to be built into the system, so that landing points and sources can be varied as the market determines the most efficient source of gas. This need for locational flexibility is a source of significant value for “spare capacity” (i.e., capacity over and above a central “forecast” of actual requirements). This value reflects the *option* value of locational flexibility that derives from the uncertainty associated with any forecast of locational capacity needs. This value is additional to the value associated with any “base case” estimates of capacity requirements and any failure to account for this option value will lead to sub-optimal investment in the network.

The costs of transitional periods of high constraint in the network, coupled with the costs of failing to account for the option value, lead to the higher ‘costs’ to the market of under provision rather than over provision of capacity. The asymmetry should make policy makers emphasise on the importance of flexibility and robustness of networks in the context of security of supply.

## **2.6 Is the current regulatory regime for electricity and gas networks, led by Ofgem, adequate to minimise risks of power or gas shortfalls due to inadequate production capacity or network inadequacy?**

Regulated asset owners are by their nature, risk-averse. An incentive structure designed to ensure that these firms invest in response to market signals should understand this attitude to risk, and ensure that the infrastructure owners are guaranteed to re-coup the full revenues from prudent investment.

As an example, the UK gas network is currently maintained to conform to the Gas Act and Public Gas Transporter licence obligations. These regulations require that Transco designs its National Transmission System (NTS) with a view to ensuring that capacity be provided to meet a level of firm demand that will be exceeded once in 20 years. The requirement gives Transco an incentive to invest when there is demonstrable growth in throughput, but not earlier. A market-driven network needs more forward-looking decision-making. The new 5-year price control (effective from April 2002) proposes output measures to give Transco incentives based on market signals. However, there is no guarantee that all investment undertaken by Transco will be included as part of its regulated asset base (RAB). If Transco acts proactively and invests above the core output levels, Ofgem will make an assessment at the end of the controlled period to decide whether Transco’s investment was an appropriate response to the market signals. Transco will therefore continue to face the considerable risk of stranded assets.

We are in agreement with The Haskins Report<sup>1</sup>, which says, “*there is a view that the financial incentives engendered by RPI-X may inhibit investment for the future*”. Markets place a high value on

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<sup>1</sup> Better Regulation Task Force *Economic Regulators* July 2001

the ability to move commodities from source to demand in response to market signals. The capacity investment required for such flexibility requires a more investment-focused mindset. The post-privatisation period of inefficiency reduction has ceased to be applicable.

The Government should reconsider the form of regulation used, and in particular, the use of RPI-X. A more appropriate regulatory tool would be forward-looking and have an incentive structure to ensure early delivery of capacity in response to signals provided by the market.

## **2.7 Should the UK have an explicit demand management policy in relation to energy? And if so, what should this policy look like?**

Rather than demand management, it is important that the Government ensures that the market has the choice to switch fuel types should the fundamentals of the market, for gas, as an example, cause the prices to go above the prices that the market is willing to trade at. Effective inter-fuel substitutability would allow the market to choose to source a greater proportion of its energy needs using an alternative fuel type.

The key to a well-designed market is that price changes relating to impending scarcity or physical constraint work their way into the market gradually, so that the forward curve is able to proactively signal the need for alternative sources of supply. Sudden price shocks to the curve, except in extreme circumstances, signal that the market has failed to price in supply side factors to an adequate degree.

A key requirement for proactive signalling is transparency. For example, the current lack of offshore information in terms of timing and size of flows provides considerable uncertainty to the UK gas forward curve. The inconsistency of the regulatory risk involved with the supply of UK gas adds to the uncertainty. Offshore, gas network information is opaque and the regulatory risk is driven by the DTI. Onshore, Transco's information, which although not complete is considerably better than that provided by offshore operators, is provided under Ofgem's very different regulatory regime. Government should re-address such discontinuities in information and regulation.

Overbearing Government action to control demand will contribute to shocks and segmentation in the development of forward curves. It is tempting to assume that some degree of Government intervention is required. However, the entry of new firms with very different business models to the traditional incumbents will provide more innovative solutions to address the energy sector's varied demands. Examples that Enron has provided include:

- high demand for storage has been met by the use of virtual storage contracts. These have allowed customers to 'store' gas with Enron and receive delivery at a pre-determined date, without having to contract for scarce physical storage.

- virtual interconnector contracts and virtual entry capacity auctions have similarly provided contractual solutions to limitations in infrastructure.
- large deals to ‘outsource’ entire energy usage, transferring the incentive to manage energy efficiency to demand management experts and in effect internalise factors such as energy efficiency rebates. Enron has recently announced a long-term deal to manage the energy needs of 450 Sainsbury’s stores. Such a deal provides evidence that demand management, energy efficiency and climate change goals can be addressed directly by the market, without the need for intervention by Government. The Government’s role in these instances is to provide market-driven incentives, as it is seeking to do with the Renewables Obligation Certificate scheme.

### **3 THE CALIFORNIA CRISIS: A FAILURE OF MARKET DESIGN – NOT A FAILURE DUE TO LIBERALISATION**

At the core of a well-designed market is the need for prices to adjust to provide accurate signals of supply and demand balance. Market participants must be able to assess these price changes, through the provision of full information, to be able to make an appropriate assessment of the costs and benefits of providing supply. In addition, regulatory certainty and the ability to manage risk through forward contractual agreements are critically important to achieving efficient market outcomes.

In California, adverse conditions have served to perfectly exemplify a *bad market design*. A well-designed competitive market would not have allowed the current situation to develop. The example of California provides a case study of how *not* to restructure a market. It does not provide a reason to question liberalisation itself. The need for security of energy supply in the longer term requires that the UK and the EU accelerate *correct* liberalisation. Controls on the actions of different elements of the market would only serve to hinder the correct functioning of the market by forcing actions that do not correspond to market signals. This lack of correspondence between market signals and responses lay at the centre of the causes of the California crisis.

#### **3.1 The requirements for an efficient market**

The requirements for an efficient energy market are:

- political commitment to market solutions
- a large number of buyers and sellers
- a regulatory environment that allows easy entry and exit for producers and retailers
- production and consumption decisions that are driven by price
- the ability to control financial risk by being able to adjust the price volatility risk faced on the buy *and* sell side
- non-discriminatory access to existing networks.



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## 3.2 What happened in California?

A unique set of circumstances ensured that a failure of the physical market, due to bad design and adverse circumstances, caused the failure of a very badly designed financial market.

### 3.2.1 Physical market failure

The key reasons for the failure of the physical market were:

- The dramatic growth of California's electricity-intensive, high technology industrial sector, combined with growth in the state's population, resulted in record energy demand. While California's demand for electricity increased, supply has remained constant. In the period 1996 to 1999, peak demand increased by 5,222 megawatts, while only 672 megawatts of new capacity was added.
- California's strict siting rules, complex environmental standards and uncertainty related to price caps have delayed new power plant development and have restricted the run-time that generators may operate. Today, it takes 5-7 years for new power plants to come on-line in California.
- Alternative energy sources are limited. Producers in states such as Oregon and Washington have stepped in to provide additional supplies to meet California's peak demand. Rates in other western states, such as Arizona, have risen dramatically as California has absorbed reserve capacity.
- Unusually hot and dry weather throughout the west exacerbated California's situation last summer. As a result, hydroelectric facilities in other states generated and exported their electricity to California. Those same hydroelectric facilities are now short of water thus promising electricity shortages throughout the Pacific Northwest.

### 3.2.2 Financial market failure

The key reasons for the failure of the financial market were:

- The suppliers were required to purchase all their electricity from the spot market. At the same time, market rules prevented the suppliers from undertaking the most basic form of risk management. This included preventing shorter-term hedging of price risk, by preventing term contracts and preventing them from hedging longer-term, by preventing them from owning generation assets. This inability of suppliers to manage price risk was critical to the financial failure of the market.
- The demand side was shielded from high prices with *fixed* retail prices. This fix ensured that users of power did not reduce their use of power in response to the scarcity. Such a design for the market made it inevitable that for the suppliers, the prices at which they were able to procure power surpassed the retail prices being collected from customers. This caused the complete failure of the financial market.

- The financial instability of California's two suppliers has meant that outside suppliers have been unwilling to face the credit risk involved with selling to them. This has hampered the procurement of out-of-state power. In certain circumstances, out-of-state suppliers have required higher prices to reflect the credit risk involved with dealing with Californian utilities.

### **3.3 Implications of the events of California for the energy review**

In the light of the launch of the energy review, there has been much ill informed discussion relating to California, and how it could be relevant to liberalising markets in Europe. Vertically integrated incumbents have, in particular, sought to misinform and stifle debate on competition in energy markets by invoking the spectre of rolling blackouts in a deregulated market.

If a lesson is to be drawn from California, it is that regulatory uncertainty and badly designed restructuring can create problems of security of supply. California does not provide a verdict on liberalisation. It must not be allowed to obscure the debate on the market's role in providing security of supply.

## **4 RECOMMENDATIONS FOR ENERGY POLICY IN THE UNITED KINGDOM AND AT AN EU LEVEL**

In summary, a competitive and liberalised market provides a platform for efficient operating and investment decisions if it allows investors to respond to accurate and timely price signals. Failures in a badly designed market in California should act as examples of how not to re-structure a market, rather than reasons for not liberalising and making the market more competitive. Our principle recommendations for energy policy are as follows:

- It is important that competition is introduced to both wholesale and retail markets, so that utilities procure wholesale contracts competitively. This provides a strong impetus to a more competitive production and generation markets, which in turn reflect lower wholesale prices. This benefits all consumers.
- Consumers should have the ability to react to market prices. Policies that promote price-responsiveness help customers to adapt to the changing market structure and encourage the development of actions that limit generator market power. If generators know that demand will decrease in response to higher prices, they will know that withdrawing capacity will not necessarily raise revenues.
- Member states should accelerate liberalisation to avoid problems with transition periods. This would provide greater regulatory certainty and would increase the incentives to expand generation and transmission capacity. The European Draft Directive's call for greater unbundling, independent regulators and accelerated market opening can be expected to



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reduce the risk of discriminatory access to the market. Siting laws and the approval process for the siting of new build must be simplified.

- Vertical integration, as seen on the continent, raises the potential of discriminatory access to infrastructure. Easy and full access to networks allows reliable and efficient movement of power from where it is available to where it is needed. An example of the importance of third-party access (TPA) to capacity is the case of Spain. High recent demand means that in the absence of new plant coming online by 2004-5, there is concern that Spain will not have sufficient generation capacity to meet peak requirements. At the same time, Enron has encountered considerable difficulty in gaining TPA for its planned power station at Arcos de la Frontière, a project that will help increase security of supply in Spain. This clearly refutes the arguments of incumbent firms that vertical integration encourages security of supply.
- Market participants must be allowed to hold a balanced portfolio of long-term and short-term contracts. Long-term contracts allow energy suppliers to lock in stable prices and protect against market volatility. Short-term contracts are most appropriate for market uncertainties, whilst providing price signals on the margin. A liquid market for long-term contracts must develop in conjunction with the short-term pools being developed.