The energy sector is of fundamental importance to the European economy, and to the well-being of citizens of the European Union. Debate about the future direction of European energy policy has been vigorous for most of the last decade, and will likely be intense during 2006. Within the framework of the decision by the Commission to open a sector inquiry in the gas and electricity markets, DG Competition has carried out an investigation into the state of competition in those markets. This paper reviews the most important issues currently under discussion, and sets out the preliminary conclusions that can be drawn from the sector inquiry. It highlights the role of competition as a key mechanism to deliver a range of energy-related policies. In particular, it points out that failure to secure effective competition in energy markets will not only lead to expensive energy, but also to failure to secure other policy objectives such as supply security and environmental protection.

Introduction

The European Union is one of the most important energy blocs in the world, and its economy is largely dependent on a secure and competitive energy supply. Historically, the state played an important role in sponsoring and overseeing the development of the energy sector in most European countries. State-sponsored development within national borders often led to the creation of monopolies in sectors that were potentially competitive. However, the European Union has in recent years adopted a number of measures aiming at liberalising energy markets and addressing other important issues of common European interest. The development of competitive market is not only an objective in itself, but also constitutes an unavoidable context for meeting other vital policy goals, and is indeed the major mechanism for their fulfilment.

Most notably, two directives from 2003 (1) require all gas and electricity end-user markets to be open for competition by 2007, and lay down a number of conditions for competition to evolve, such as non-discriminatory access to transport and storage infrastructure. These directives also require Member States to ensure high standards of consumer protection, and set minimum standards for protection of household customers, while making clear that consumer protection should be delivered through and in the context of competitive markets. In 2004 and 2006, two further directives laid down conditions to ensure minimum standards for security of supply, clear responsibilities and monitoring requirements (2). The Directives set out to create a security regime appropriate to a liberalised market, and make clear that market actors have major roles to play (3). As regards environmental protection, European legislation exists on energy efficiency (4), and on promotion of electricity generation from renewable energy sources (5); again, these rules set out to meet their objective through the operation of competitive markets. Of key significance for the electricity sector is the emissions trading scheme established in 2003 (6), under which generators have to secure permits to issue greenhouse gases, and can do this through trading permits.

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(3) Security of supply is no small task: the International Energy Agency estimates that the OECD countries of Europe will need to invest around 2,000 billion US dollars by 2030 to secure their energy supplies.


Markets as mechanisms to deliver other policy objectives

With respect to security of supply, the key challenges of the last decade have related mostly to the electricity markets, and the focus has been mainly on whether network infrastructures and generation capacity were adequate to meet demand. Experience shows that competition is wholly consistent with proper network security. For instance, network security has consistently improved since competition was introduced into the UK market (7). Network failures (such as the Italian black-out of 2003) have arisen from failures in system operation — and are perhaps indirectly related to regulatory issues — rather than as a result of competition. In the field of gas, the key concerns relate to the EU’s declining ability to produce its own gas and the ensuing increased dependency on gas imports. Since the EU is surrounded by gas producing regions (Norway, Russia, Caucasus, Middle East, North Africa, West Africa, and the Caribbean), such an import dependency is not in itself a cause for alarm. However, there is a need to determine the best means to attract necessary investment so as to extract and transport these gas reserves to EU markets.

Investors are likely to require clarity about management of the inevitable risks associated with investment in energy networks or production. Historically, long-term contracts have been a key means of sharing risk. Where the downstream counterparty had retail market power or a monopoly, the arrangement also enabled the risks to be passed to customers. Alternatively, vertical integration has been used to create a natural hedge and facilitate on-balance-sheet financing of investments. Competition now offers an alternative means to sustain investment — which is simply the normal mechanism in market economies. The creation of deep and liquid markets inherently reduces stranding risk, and enables price risks to be managed through trading of forward products. Indeed, the investment signals arising from well-designed competitive markets may be more accurate than the planning of vertically integrated companies, leading to more efficient investment.

Experience with liberalised energy markets in Europe is still short, but at this stage gives reasons for confidence that markets can provide sufficiently clear signals and risk-hedging tools to guide and support investments in generation. The UK has experienced an important investment boom in gas-fired generation since liberalisation. Equally, high electricity prices on the Italian peninsula have led in recent years to considerable amounts of generation capacity being built. A substantial number of generation plants have also been constructed in Spain as a result of market signals. As for gas, competitive pricing in the UK has sent signals that are leading to large investments in new import infrastructure.

Finally, market mechanisms are being given an important role in reducing the environmental impacts of the energy industry. Many Member States have experimented with boosting the value of renewable electricity by allocating tradable certificates to green generators, which have value because suppliers are obliged to acquire a certain number of certificates each year. More widely, all large combustion facilities must now acquire certificates to emit greenhouse gases, and the cost of securing certificates is now widely included in the price of electricity. Analysts do not yet agree whether the emissions trading scheme has had a major impact on the cost of electricity. Electricity prices have risen, and so have the costs of emissions permits, but the causal link is not wholly clear. Although it is therefore perhaps too early to establish exact patterns of causality, it seems clear that using a market mechanism to limit emissions has created the potential for this environmental measure to take account of external events, like rising gas prices. This inherent flexibility should make it more efficient than a centrally planned carbon-reduction strategy.

Preliminary results from the energy sector inquiry

Given the importance of competitive markets, DG Competition has set itself to determine how well competition in the energy sector has been functioning. The overall objective is to address the barriers to competition currently impeding the development of fully functioning open and competitive EU-wide energy markets.

As part of the inquiry DG Competition has met with several dozen market participants, and sent out over 3,000 questionnaires. The inquiry has published a brief ‘issues paper’ setting out key findings, and also a longer Preliminary Report (8). The inquiry’s Final Report is expected to be published later in 2006. In the first phase of the inquiry important competition distortions were identified in gas and electricity markets.

(7) As networks are regulated natural monopolies, it is strictly speaking regulation combined with effective system operation that ensures security of supply, rather than competition.

The key preliminary findings as regards these categories can be summarised as follows:

**Gas**

At the wholesale level, markets generally maintain the high level of concentration of the pre-liberalisation period. Wholesale trade has been slow to develop, and the incumbents remain dominant on their traditional markets, by largely controlling up-stream gas imports and/or gas production. Incumbents trade only a small proportion of their gas on hubs. With little new entry in retail markets, customer choice is limited and competitive pressure reduced. The overall picture for potential new entrants is one of dependency on vertically integrated incumbents for services throughout the supply chain.

Lack of liquidity and limited access to infrastructure mean that markets are foreclosed and new entrants are prevented from offering their services to the consumer. The network of long term supply contracts between gas producers and incumbent importers makes it very difficult for new entrants to access gas on the upstream markets. Additionally, certain features of these contracts limit incentives for incumbents to provide liquidity on wholesale markets. Gas infrastructure (transmission networks and storage) is to a large extent owned by the incumbent gas importers, and the insufficient separation of this infrastructure from supply functions results in insufficient market opening. Despite EU rules on third party access and legal/functional unbundling, new entrants often lack effective access to networks, the operators of which are alleged to favour their own affiliates.

A lack of market integration means that cross-border sales do not presently exert any significant competitive pressure. Incumbents rarely enter other national markets as competitors and available capacity on cross-border import pipelines is limited. New entrants are unable to secure transit capacity on key routes. The primary capacity on transit pipelines is controlled by incumbents based on legacy contracts that derogate from normal third party access rules. The foreclosure effect is reinforced by ineffective congestion management mechanisms, which can make it hard to secure even small volumes of short-term, interruptible capacity on the secondary market. In most cases, new entrants have not even secured capacity when there have been expansions of transit pipeline capacity.

Network users request more transparency on access to networks, transit capacity and storage, going beyond the current minimum requirements set by EU legislation. For instance, confidentiality rules risk being used to impede effective transparency when given too wide an interpretation. To ensure a level playing field, users require information to be made available on an equal footing with the network owner.

More effective and transparent price formation is needed in order to deliver the full advantages of market opening to consumers. At this stage, gas import contracts use price indices that are linked to oil products and recent price increases have, therefore, closely followed developments in oil markets. This results in wholesale prices that fail to react to changes in the supply and demand for gas, which distorts incentives to invest, for instance in gas storage and transit facilities. No clear trend towards more market based pricing mechanisms can be observed in long-term import contracts. Gas prices on existing gas hubs have also been rising recently, and ensuring liquidity is crucial to improving confidence in price formation on gas hubs.

**Electricity**

Most wholesale markets remain national in scope with high levels of concentration in generation, which gives scope for exercising market power. Analysis of trading in power exchanges shows that, in a number of them, generators have the scope to raise prices, a concern also expressed in the inquiry by many customers. Analysis of generation portfolios also indicates that the main generators have the ability to withdraw capacity to raise prices. Further assessment will be needed, however, in order to determine whether operators have unduly used these possibilities to raise prices.

Vertical integration of generation, supply and network activities has remained a dominant feature in many electricity markets, which creates risk that markets are foreclosed for new entrants. Vertical integration of generation and retail reduces the incentives to trade on wholesale markets. Lower levels of liquidity on such markets are an entry barrier. Furthermore, the strong links between supply and network companies reduce the economic incentives for the network operators to grant access to third parties. Many respondents are highly critical of the efficiency of existing unbundling obligations, believing that discrimination continues in favour of affiliates, and call for stricter measures.

The low level of cross-border trade is insufficient to exert pressure on (dominant) generators in national markets. Integration is hampered by insufficient inter-connector capacity and long-term capacity reservations predating liberalisation. Improving
access to inter-connectors requires better methods of congestion management. There is also a lack of adequate incentives to invest in additional capacity to eliminate long-established bottlenecks. Differences in market design between Member States hamper market integration.

There is a serious lack of transparency in the electricity wholesale markets, which is widely recognised by the sector. Improved transparency would minimise risks for market players and thereby reduce entry barriers to generation and supply markets, while improving trust in the wholesale markets and confidence in its price signals. Users request more information on technical availability of inter-connectors and transmission networks, on generation, on balancing and reserve power, and on load. Rules on proper market conduct and supervision differ significantly between Member States.

Price formation is complex, and many users have limited trust in the price formation mechanisms. Analysts cannot yet agree on the extent to which the EU emissions trading scheme has affected electricity prices. The co-existence of regulated and free market prices on several national markets has an adverse effect on the development of competitive markets.

Conclusion

It therefore does not come as a surprise that the Commission’s 2006 communication to the Spring Council recognises the need to reinforce the internal energy market, in particular by taking steps to address: the continued dominance of national incumbent operators; insufficient market transparency; inadequate unbundling of network and supply activities; and barriers to cross-border supply preventing a truly integrated EU energy market.

First lessons from the sector inquiry for competition and other policy areas in energy

Market concentration

Market concentration has been identified as a fundamental problem. The natural consequence of this situation is non-competitive pricing, which is clearly prevalent in gas, and may exist in electricity. So far, the strength of historic monopolies has not been challenged. Companies themselves, however, have reacted swiftly to liberalisation through mergers and acquisitions. These have included proposals to integrate powerful gas and electricity companies in a number of Member States (4). Such mergers can reduce fuel-sourcing risk for gas-powered electricity generators, and reduce volume risk for gas companies. However, as the sector inquiry has confirmed, they may equally reduce the number of potential competitors and sterilise parts of otherwise contestable markets. Effective application of the merger regulation is therefore essential and the results from the inquiry will help identifying the most relevant criteria and the most efficient remedies in the given market environment.

While merger control has thus a key role to play, it remains necessarily reactive: the Commission only deals with transactions that are notified to it. Moreover, merger control cannot effectively address competition problems caused by already existing dominant position. Articles 81 and 82 therefore also have an important role to play in terms of preventing companies from using illicit means to restrict actual or potential competition.

Market integration

Lack of access to cross-border gas pipelines, to gas storage and to electricity inter-connectors has been found to be a major stumbling block towards more market integration and should be another immediate priority for review in terms of anti-competitive conduct. There are substantial indications that the remaining ‘grandfathered rights’ (9) seriously impede effective entry of competitors and therefore undermine the pro-competitive operation of the market.

If inter-connections between Europe’s national markets were adequate in size and not congested by legacy contracts, market power in national markets would be diluted into larger regional or pan-European markets. Incumbents therefore have pricing power partly because inter-connection is inadequate. They would in general not have an interest in investing in infrastructure to facilitate the coupling of national energy markets. Such disincentives to expand inter-connection are of particular concern, since increasing inter-connection could have wide benefits. As we have seen, it

(4) For instance, the merger of E.ON and Ruhrgas in Germany; Centrica’s acquisition of substantial generation capacity in the UK; the proposed merger of Endesa and Gas Natural in Spain; and, of course, the merger that was proposed between ENI / EDP / GDP in Portugal but was prohibited by the Commission in its decision of 9 December 2004 in Case No COMP/M.3440. This prohibition decision was upheld by the CFI in its judgement of 21 September 2005 in Case T-87/05 EDP — Energias de Portugal SA.

(9) Capacity rights stemming from pre-liberalisation contracts.
could benefit competition. It could also substantially increase system security by enabling gas or power to flow from new sources. Also, in the shorter term, it could enable new players to offer the ancillary services or flexible gas that are necessary to help maintain network balance, and so reduce the costs of network operation.

The inadequacy of incentives to invest in interconnection arises also from the ‘regulatory vacuum’ that exists for the international segments of the gas and electricity grids. There are a number of schemes between national regulators in place or being set up to strengthen coordination in this area. However, the findings raise questions about whether purely voluntary cooperation schemes between regulators will suffice to provide the investment certainty and regulatory protection that are needed to develop international pipelines and inter-connectors in a stable environment, and to keep them open.

Unbundling

A further root cause of negative investment incentives is that such investment decisions are generally in the hands of transmission system operators which are frequently in common ownership with incumbent generators or suppliers. A real breakthrough towards effective competition in the gas and electricity markets will not be possible unless the systemic conflicts of interest resulting from vertical integration are effectively addressed. Such conflicts make the Community’s energy system less receptive to the introduction of new forms of energy production, such as renewables, owing to the stake holders’ interest at all three levels of the value chain; and they hinder an effective diversification of supply, which is an indispensable element towards more security of supply.

The sector inquiry’s preliminary findings suggest that only structural change would be an ultimately effective remedy. The basic impediment to more competition and market integration is structural: the incumbents’ vertical integration of supply, transmission and distribution that persists in many Member States. It therefore seems unavoidable that full structural unbundling in all Member States should be part of the ensuing policy debate. Structural unbundling (i.e. effective separation of the supply and retail business from the monopoly infrastructures), while not solving all the observed problems in the market, would seem to decisively enhance non-discriminatory treatment of competitors, entry opportunities, as well as investment incentives.

Prices and investment signals

Even if the Preliminary Report does not yet allow us to draw final conclusions on the oil-gas price link, this feature of the gas markets certainly requires further attention. The current extensive use of oil-linked contracts appears to be over-stating the extent of the real economic link between these two energy sources (11). This introduces into gas pricing an element of volatility, which is quite unrelated to the actual supply-demand balance of gas in Europe.

In consequence, companies considering an investment in producing gas need to take a view on the likely price evolution of a different commodity, with radically different supply-demand dynamics (12). This introduces substantial (and unnecessary) risk into these investment decisions. The risk may depress overall investment, which could endanger supply security. It could also lead to inefficient investments, which might further magnify the price volatility, or undermine the financial stability of the European gas industry. Evidently, as most new-built generation is gas fired, distorted price signals from the gas market are bound to spill-over into power markets.

In addition, the actual operation of indexation clauses tends to eliminate the natural seasonality of gas prices (arising from higher demand in the winter). This reduces incentives to build storage near the location of demand, which reduces supply security.

Impact on related policy goals

The barriers to effective competition on energy commodity markets need to be addressed urgently also because they present dangers for other market-based mechanisms, such as emissions trading, trading of renewables certificates, or management of network congestion through auctions. In general, market mechanisms rest on an assumption that the most efficient price for a good will emerge from each party offering to pay a price related to how valuable the good is to the buyer. However,

(11) Of course, to the extent that gas is in fact competing with oil, the prices of the two commodities would be linked. However, we might expect the amount of gas-oil substitution in Europe to be limited, given the relatively marginal role of oil-fired power generation here, and the significant costs of switching space- or water-heating between the two fuels.

(12) Oil is a global commodity, and a mature industry which is likely to be close to the peak of production; gas is a regionalised commodity, with substantial untapped reserves and new reserves being discovered.
market power creates the possibility to generate more margin from market activity, which means a company with market power on energy markets will be willing to pay more for inputs necessary to such activity, such as rights to interconnector or transit capacity. This creates a potential distortion of the market mechanism which, if uncorrected, could undermine its ability to generate the most efficient outcomes.

Conclusion

The European energy industry operates now within a legal framework that is organised around market economy principles. Market mechanisms are envisaged as delivering not only competitive prices, but also investments to underpin supply security, high levels of public service, and environmental measures.

Nevertheless, energy policy continues to be debated. Particular topics of debate include the relationship between competition and supply security, and what company and market structures are appropriate for a competitive market.

DG Competition’s sector inquiry has shown that serious distortions in energy competition continue to exist. Given the importance of market mechanisms for delivering policy objectives, these distortions can be expected to have a negative influence on progress towards these other policy goals. In particular, trading mechanisms cannot be relied upon to deliver efficient progress if they are distorted by market power, and supply security is undermined by perverse incentives to limit market integration and a lack of clear price signals.

In summary, being ‘half-liberalised’ is a dangerous position to be in, and if Europe stays half way to fully competitive energy markets, it cannot be confident of securing any of its main policy objectives: neither competitive prices, nor the investment required to secure supplies, nor an efficiently-delivered reduction in environmental impacts. Action is needed quickly to deliver on the promises of a competitive internal energy market.