

**Competition and Regulation in the Gas Industry:
An Evaluation of the MCC Report on Gas in the UK**

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Oxford Institute for Energy Studies

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Executive Summary

Following the publication of the Monopolies and Mergers Commission (MMC) reports on the supply of gas, the future structure of the industry in the UK is under review. The findings of the MMC are of vital concern to the UK gas industry and of considerable interest to other gas industries, both in continental Europe and beyond. Within the UK, the reports and the government's response will determine the contours of the industry and the scope of business opportunities over the next decade. Abroad, the UK gas scene is observed carefully as a laboratory experiment in gas liberalization.

At present, gas consumers are, by and large, satisfied with the performance of the industry, and the exploration and production business is undergoing a boom. Proposals for a radical restructuring of the industry should, therefore, only be accepted if they offer clear advantages over the present system.

In the case of a homogeneous commodity such as gas, advantage is effectively synonymous with lower prices. Because there are constraints on the availability of gas supplies and because gas is not readily tradable on a prompt basis, the potential for price reductions to consumers from a more competitive market is limited.

There is already a *prima facie* case that the presence of competing marketers is re-allocating rents upstream, rather than to end-consumers, and this process could be expected to accelerate in a more liberalized market. For many domestic consumers any price change resulting from a competitive market would be overwhelmed by the inevitable phasing out of cross-subsidies and the shift to cost reflective charges. For all consumers prices will be affected more by the regulation of charges for the monopoly transportation business, than by competition in supply.

The benefits from a competitive market in gas in the UK are not clear-cut. There is good reason to think the introduction of further competition will bring few gains while creating significant losses. The dismemberment of BG threatens a successful and international company without offering proven benefits. The abolition of the domestic monopoly involves complex and contentious issues which remain to be resolved. Given the present functioning

of the gas business and the low priority attached by the public to reform, it would be unwise of the government to produce any major changes in response to the MMC report. Other than on purely ideological grounds, there appears to be little justification for seeking greater liberalization of the UK gas market.

Introduction

Following the referral of British Gas plc. (BG) to the Monopolies and Mergers Commission (MMC) in July 1992, the MMC spent one year on a wide-ranging enquiry into the UK gas industry and has written two separate but related reports: one under the 1973 Fair Trading Act, the other under the 1986 Gas Act. The arguments of the interested parties in this enquiry were largely kept out of the public arena, until the summary and conclusion of the MMC reports were published on 17 August 1993. A further two volumes with supporting factual analysis and an account of views submitted are yet to be published, and were not available at the time of writing this evaluation.

The findings of the MMC are of vital concern to the UK gas industry and of considerable interest to other gas industries both in continental Europe and beyond. Within the UK, the report and the government's response will determine the contours of the industry and the scope of business opportunities over the next decade. The logic of the MMC's report also has implications for other regulated UK utilities. Abroad, the UK gas scene is observed carefully as a laboratory experiment in gas liberalization. Policy-makers in the EC in particular are wondering whether to follow the UK example of a more liberalized market and some Eastern European countries are anxious to draw lessons prior to the possible privatization of their own gas utilities.

This paper discusses the merits and drawbacks of a more competitive gas market in the UK as proposed by the MMC reports. It begins with a brief description of the industry and the different functions of BG for readers less familiar with the UK gas business. After a brief overview of the MMC's findings, the paper goes on to examine the issues and problems involved in greater depth. The conclusion provides a synthesis of the ideas emerging from the paper.

Chapter 1: The UK Gas Industry

Natural Gas accounts for one-quarter of the UK's overall energy needs and is the third largest source of energy behind oil (38 per cent) and coal (29 per cent). Excluding the transport sector, its share is just below 50 per cent and is increasing through the rapid adoption of gas in electricity generation, mainly at the expense of coal. This high consumption level has been met by the development of North Sea and Irish Sea reserves. Within Europe only Norway and the Netherlands possess greater gas reserves.

Britain has been predominantly self-sufficient in gas with international trade being limited. Although imports from Norway accounted for a quarter of supplies in the mid-'80s, they now represent less than 10 per cent, not least because of a government preference to promote indigenous supplies. Minor deliveries of liquefied gas come from Algeria to help service peak winter demand. The first exports of UK gas were sanctioned in 1992 and are delivered directly from the gas field by dedicated pipeline to the continent. While Britain is not connected to the continental gas grid, plans exist to build an interconnector across the English Channel.

British Gas

British Gas (BG) retailed over 80 per cent of the nation's gas in 1992. Indeed, before 1990, there had been no independent sales at all, even though BG's *de jure* monopoly on supply had been lifted in 1982. BG is a vertically-integrated utility owned by over 2 million shareholders with a market capitalization of £14 billion, placing it among the top ten UK firms and making it one of the largest and most financially powerful energy companies in the world.

BG's activities can be divided into four main categories:

- Exploration and Production

BG owns the largest single proportion of UK gas reserves and is the biggest producer but does not dominate the upstream market with 17 per cent of total production. Along with other producers, it has equity stakes in offshore pipelines which are not officially subject to regulation and are not legally required to offer access to competitors. BG's exploration

activities extend worldwide with major interests in Gabon, Tunisia, Thailand and Indonesia. BG E&P is also set to develop the Karachaganak field in Kazakhstan, in a joint-venture with AGIP. Its foreign interests are the result of a recent strategy of "internationalization" which is aimed at countering the (future) loss of market share in the UK through regulatory constraint. The capital assets represented by UK pipelines mean BG enjoys a high credit rating, and BG E&P has had relatively easy access to capital markets in financing its overseas operations.

- **Transportation**

This refers to the conveyance of gas through the pipeline system, whether through the high-pressure National Transmission System or the lower pressure regional and distribution network. The pipeline system (260 thousand kms long) covers most of Great Britain and is almost wholly owned by BG. Storage facilities can also be seen as part of the transportation business since they are a necessary part of maintaining the appropriate balance in the lines. BG's main storage facilities are the offshore converted Rough gas field, salt caverns located in Humberside and liquefied natural gas storage units. The transportation business must ensure the safe running of the entire network and is therefore also responsible for dealing with leaks and emergencies.

BG is legally obliged to convey gas belonging to rival companies through the system in return for a tariff payment determined by its regulator, Ofgas.¹ Since maintaining safe pressures in the pipeline system at all times is a delicate process, as is meeting the fluctuating demands of customers, and since any tariff can be based on a complex hybrid of capacity reservation or commodity throughput, precise third party transportation charges and terms are a common area of regulatory dispute.

- **Trading/Marketing**

This involves purchasing gas from the offshore producers, selling the gas to final customers, reading their meters and billing.² It should be noted that BG has always operated Trading and

¹ A legal obligation known as Third-Party Access.

² Meter reading could be included under transportation.

Transportation as a "bundled" service called "Gas Supply". Separate accounts indicating the breakdown in costs or profitability between these two functions will become available for the first time next year. On the separation of trading and transport, trading would have the extra task of booking capacity in the pipeline.

BG has a large supply portfolio receiving gas from many different fields, many different companies and at varied levels of flexibility of delivery. These contracts are long-term - some were signed in the late 60s and are still current - and, depending on when they were signed, have very different prices. The quality of the gas and the production profile of each field also have a major bearing on the price. The price range varies from 0.25p/kWh (8p/therm) to 1p+/kWh (30p+/therm), with an average beach price of about 0.6p/kWh (17.5p/therm). While this average is currently in line with the marginal price for contracting gas from a new development there is no necessary relationship between the two. In other words, BG and its competitors are not automatically subject to the same gas costs.

BG has three main categories of customer. The first are firm users, in the sense that they have guaranteed supplies at all times, with annual demand over 25,000 therms. Some thirty companies are actively involved competing for this market. (102 companies are legally licensed to compete.) BG's rivals compete through tender but BG itself is temporarily tied to published price schedules while it conforms to regulatory pressure to lose market share. Its market share currently stands between 40-45 per cent (excluding power generation sales). The average unit price for gas from BG to these customers is about 1p/kWh (30p/therm).

The second category of customers have interruptible contracts. This market comprises users with an annual consumption over 25,000 therms who receive gas at a discount on the understanding that supplies to them can be cut at peaks of demand. Through the use of these terms BG is able to reduce the need for expensive seasonal storage or peak-shaver fields (ie. fields which are not kept in regular production) during the peaks of winter demand from the residential sector. Many interruptible customers have dual-firing capacity and can switch to alternative energy sources, usually heavy fuel oil. Interruptible gas prices therefore tend to track heavy fuel oil prices and are around 0.6p/kWh (19p/therm). This price offers a small margin on beach prices and a negative margin after transportation costs. Since BG's

competitors do not serve the residential sector and thus have less of a peak load problem than BG, it is not surprising that not a single independent sale has been arranged in the interruptible market.

Together, the firm and interruptible market are referred to either as the contract or non-tariff market. Prior to the publication of the MMC report, BG had agreed undertakings with the Office of Fair Trading (OFT) to reduce its share of the contract market to 40 per cent (excluding power generation) by 1995. (Power generation is a new market and so BG had no incumbent position.) This presents a problem as interruptible sales are at least 40 per cent of total contract volumes. Therefore, in order to reduce its contract market share to 40 per cent, BG was being asked either to leave the firm market completely, or to lose market share in the interruptible market where other firms were unwilling and unable to compete. (To compound BG's difficulty it was also instructed not to raise its prices in order to reduce market share).

BG agreed with the OFT a release gas scheme whereby parts of its contractual gas supplies are sold on to its competitors on a wholesale basis. Otherwise, BG would have excess supplies to cater for its reduced markets and competitors would find it impossible to buy up sufficient new supplies from the North Sea to serve the new market in such a short time. BG receives a small premium for these sales.

The final category of customers make up the tariff market, all with an annual demand of less than 25,000 therms. This includes 17.5 million residential customers and some 300,000 commercial businesses. BG is obliged by statute to supply any customer in this market who is within 25 yards of the distribution network. Those customers with a yearly consumption of 2,500 therms or more - (an expenditure greater than £1,200) - have been able to buy from the rival gas marketers since August 1992. So far, the marketers have gained about 13 per cent of this 2,500 therms and above tariff market. BG has a statutory monopoly for customers below 2,500 therms. It is obliged to supply this market through non-discriminatory national tariffs. It is not clear whether non-discriminatory implies uniform across the entire country, but at present BG offers uniform tariffs across all regions. The tariff formula is based on an RPI-X system. Average consumer gas prices can rise by a maximum given by the rate of

inflation plus the change in average beach prices, minus the "X" factor which is intended to proxy the rate of cost savings and technological improvement. X is currently set at 5 and the average price for domestic gas is 1.7p/kWh (50p/therm).³

- **Global Gas**

This division, like overseas exploration, was born out of the internationalization programme. BG has a number of important assets around the world of which the most important are its equity stake in part of the Argentinian pipeline system, bought at its privatization in 1992, and its ownership of Consumers Gas in Canada. As in the case of E&P, Global Gas benefits from a healthy credit rating by virtue of the group's capital assets held in pipelines.⁴

Competitors & the Regulatory System

There are 102 companies licensed to compete against BG, of which about 30 are significant players: the others having sold on their release gas to this group. The largest are subsidiaries or joint-ventures of North Sea producers, who are attracted by the possibility of marketing their own gas, or electricity companies, plus a handful of independents.

The structure of the industry includes regulatory and watchdog bodies. The precise authority and jurisdiction of each regulatory body is complex and open to interpretation but the following provides a rule-of-thumb.

BG has two separate monopolies, one relating to the transportation of gas, the other to supply of residential customers (2,500 therm maximum users). It is the job of the Office of Gas Supply (Ofgas) to ensure that monopoly transportation charges and residential tariffs are set at an equitable level. The Gas Consumers Council (GCC) was likewise established through the Gas Act of 1986 with the responsibility to represent consumers interests and investigate complaints. In relation to the contract market, BG enjoys a dominant market position as the incumbent and is therefore subject to the overview of the Office of Fair Trading. The MMC

³ Other minor markets for sales are gas as feedstock in chemicals plants and natural gas vehicles.

⁴ In addition to these four categories, BG also owns retail shops selling gas appliances and runs an installation and customer service function.

can be asked in certain instances to arbitrate over unsettled disputes between the regulators and BG, although its powers are limited to recommendations and proposals. Where these involve legislative action, the final decision rests with the government. The MMC's powers are currently remedial, not penal: it cannot fine a company for past abuse of market power and can only suggest procedures to prevent continued abuse.

Chapter 2: The MMC References

The 1992 referral of BG to the MMC was an unusually complicated affair involving four separate referrals under two separate legislative appeals. Two references were made by the Department of Trade and Industry under the Fair Trading Act 1973. The other two references were made by Ofgas under the Gas Act 1986. Separate reports of conclusions had to be published for each Act but they involve substantial overlap and cross-reference. The supporting volumes of factual analysis, due for publication in September, are common to both reports.

The DTI references asked for an investigation of the supply of gas, meaning transportation and marketing, to all customers and the conveyance or storage of gas by public gas suppliers, namely BG. These were generally interpreted as requests for a wide-ranging review of the entire industry made at the request of BG. BG felt that it was being subjected to over-stringent financial pressures and that piecemeal reform from autonomous regulatory bodies was detrimental both to the industry and to its own medium and long-term planning. In addition to conflicting opinions between BG and Ofgas as bodies, their relationship was also perceived to be acrimonious at the level of the individuals involved. BG hoped an MMC review would clear the air and provide a starting point for the new appointees as BG Chairman and Director General of Ofgas due before the end of 1993.

The references made by Ofgas were necessarily more focused - in line with its limited jurisdiction - and concerned the possible operation against the public interest of BG's monopoly transportation and in the setting of tariffs.

Chapter 3: The MMC Conclusions

The MMC's fundamental premise is that BG's ownership of the monopoly transportation facilities and its active involvement in trading represent "an inherent conflict of interest which makes it impossible to provide the necessary conditions for self-sustaining competition"(1.6).⁵ The failure to separate out transportation and trading costs makes it impossible to treat BG trading on an equal footing *vis-à-vis* rival traders. Nevertheless, the MMC believes that the publication of transparent separate accounts and the creation of an autonomous trading subsidiary would still not be adequate to ensure that BG trading was not benefiting from favoured status. "We see a wide spectrum of decisions relating to transportation and storage that would still be influenced by the interests of BG's trading activities"(1.10). As a remedy the MMC recommends BG's trading activities should be placed under separate ownership by 1997. The costs of the company restructuring should be passed on to the consumer and BG is free to decide between a demerger, a sell off or a flotation. As a preliminary step, the trading and transport divisions should operate separately from April 1994 within BG.

No further breakup of the company is recommended on the grounds that it is not clear that the extra costs of a more radical breakup could be recouped through extra competition gains. The MMC felt that BG's ownership of an E&P division and its overseas activities were not at the root of the problem although it suggested "consideration by the regulator will be necessary in the future"(2.170).

The second major MMC recommendation is that the monopoly on supply to the domestic market should be lifted but that this should not take place before 2000. It does not believe that BG's conduct in operating the tariff monopoly was against the public interest but nevertheless thinks the removal of the monopoly would be beneficial to customers subject to "careful consideration" and appropriate legislation.

As a step towards removal of the monopoly, competition should be allowed into the tariff market among consumers of more than 1,500 therms in 1997. This market covers only about

⁵ All quotations, unless otherwise stated, come from *Gas*, Volume 1 of reports under the Fair Trading Act 1973.

3 per cent of customers, involving very large domestic users such as those who use gas to heat private swimming pools.

Turning to tariffs, the MMC advocates an acceptable real rate of return (ROR) of between 6.5-7.5 per cent on new investment and 4-4.5 per cent on existing assets.⁶ This compares with BG's arguments for 10.8 and 6.7 per cent respectively and the Ofgas evidence calling for 2-4 per cent on existing assets. Based on these figures, the MMC expects BG and Ofgas to develop a formal charging system incorporating a price cap formula. Up until now, BG had not needed to set internal transportation fees and third-party tariffs had been set in a largely *ad hoc* fashion, assuming a rate of return of roughly 4.5 per cent on existing assets. No allowance is to be made in the suggested MMC tariff formula for the pass-through of transportation costs.

However, the MMC accepts that the current price cap on domestic tariffs (RPI-5) is too onerous given the loss of market share to competition *within the tariff market*. The MMC believes that BG should be allowed to recoup the profits it loses through competitive undercutting in the tariff market by raising the price cap. It suggests a re-adjustment to RPI-4. The scope of the tariff formula should no longer cover the 2,500-25,000 therm market but be replaced by non-discriminatory published price schedules as already in use in the contract market.

The MMC allows BG a further concession with regard to market share targets. Instead of mandating BG to lose 60% of the contract market, it proposes BG loses 45% of the competitive (2,500+ therms) market. The actual volume to be shed is equivalent to the original 60% share loss as planned by the OFT, but loss of volume in the tariff market counts towards the target. Hence BG is able to spread its market loss over a wider span of customers. The loss of market share depends on sufficient availability of gas to competitors and is to be achieved, in part, by a continuation of the present release scheme. In 1995 the regulator should consider whether an extension of the scheme is required, although it "is not an acceptable or necessary element for sustaining competition in the longer term" (2.125).

⁶ The rates of return are formulated on a current cost accounting basis and would be higher based on historic cost, as used by most UK companies.

Published price schedules should also be maintained until, "in the judgment of the Director, competition can be regarded as 'self-sustaining' and BG's position as no longer dominant" (2.97).

Finally the MMC rejects suggestions that the regulatory system is not working. To the contrary it implies that Ofgas in particular has been an effective force. Besides, the removal of the central conflict of interest between transport and trading should, in the MMC's mind, mitigate the more confrontational issues and lead to a more co-operative relationship between regulator and regulatee. The MMC did see the need to extend the powers of the Director General of Gas Supply to cover issues within the contract market alongside the Director General of Fair Trading, which would bring the regulatory structure into line with those of other utilities.

During the course of the enquiry, claims were made that any breaking up of the company or forced surrender of the tariff monopoly - as indeed has been proposed - would be a violation of guarantees made to shareholders in the *1986 Prospectus* for privatization. The MMC's response is that all references in the prospectus were qualified by mention of competition legislation or change in government policy. The Gas Act (and Fair Trading Act) both make clear the possibility of investigation by the MMC followed by appropriate remedial measures and "we are not restricted, therefore, from a full consideration of any action necessary to remedy any effects adverse to the public interest" (2.22). The 1988 MMC enquiry into gas had taken the same line.

Chapter 4: MMC Report - an Assessment

We now consider the findings of the MMC enquiry under the following headings:

- The structure of BG
- The monopoly threshold
- Setting charges for the tariff market and transportation services
- The market share targets
- The regulatory system
- Guarantees to shareholders

The Structure of BG

The proposed divestment of BG's trading activities has some attractions. Primarily it is a solution to the apparently irreconcilable positions of Ofgas and BG. Ofgas insisted on a total separation under different ownership of BG's trading and transportation activities and, to this end, proposed the divestment of the transportation business. BG objected to this strongly, arguing that the loss of valuable capital assets bound up in its pipelines, would adversely affect the financial strength of the company, weaken its credit rating and thus harm its programme of international expansion. Secondly, BG is able to win many of its contracts abroad by offering experience and expertise throughout the gas chain from production through transmission down to final distribution. The Ofgas proposal would break this chain of knowledge and might place BG at a disadvantage to an integrated competitor such as Gaz de France.⁷ Since BG has been forced into its overseas expansion as a response to a mandated loss of markets at home - a strategy being adopted increasingly by other privatized utilities for similar reasons - it would seem unfair on the company to hamstring its adjustment strategy. The divestment of BG's trading arm satisfies Ofgas's demand for separation without impairing BG's plans.

The need for an effective BG presence in the international markets also has a political aspect.

⁷ Of course, many non-integrated companies compete successfully abroad, as evidenced in the privatization of Gas del Estado in Argentina last year.

The government and the President of the Board of Trade in particular, are said to approve BG's role as a "champion" of British industry abroad. According to press reports, the Prime Minister accepted on a business trip to India with BG's Chairman, Robert Evans, the need for large, experienced companies to compete effectively abroad.⁸ The MMC may therefore have felt that the proposed form of breakup has the most likely chance of acceptance.

The suggestion that restructuring costs, estimated at between £80-£130 million, be passed through to customers and not borne by shareholders may be less politically palatable. It is likely to run into opposition from Ofgas, consumer bodies and the wider public, who would prefer the costs to be absorbed by BG's profits. On the other hand, the government will be anxious, in the eventuality of a breakup, to placate BG shareholders and maintain their confidence given plans for further privatizations in the near future. Since the consumers, not the shareholders, are the intended beneficiary of any breakup, it would be consistent to pass the costs on to the former.

Cost was the main MMC argument against more radical restructuring plans, some of which were estimated by BG to cost £2-£3 billion. In rejecting the option of breaking BG into 12 competing marketers, based originally on present regional divisions but with the right to compete nationally, the MMC seems to be implying that, whereas the introduction of *some* self-sustaining competition will bring substantial gains, the introduction of *many* competitors is unlikely to bring proportionate extra gains. There is already no shortage of competitors willing to enter the market without forced regulatory procreation of new companies. The "death by a thousand cuts" proposals did find favour with regional electricity companies who saw the possibility of buying up regional gas companies and offering a horizontally integrated energy marketing company with common billing and "one shop" services, ie. a single telephone line for all customer queries. This already exists in the USA and offers potential savings in costs and energy efficiency. The proposed route of reform does not however exclude the emergence of such horizontally integrated energy companies.

Of more concern, is the decision to leave E&P and transportation under common ownership.

⁸ Evans is Head of the Indo-British Partnership Initiative and Cedric Brown, BG Chief Executive, is Chairman of the Oil and Gas Subgroup of the Overseas Project Board.

Although this ensures the advantages of a vertically-integrated company as mentioned above, it also involves an inconsistency in the MMC's argument. The MMC concluded that there was an "inherent contradiction" in one company competing with others in marketing and simultaneously controlling the transportation network. One could equally well argue there is an inherent contradiction in one company competing with others over the production of gas but controlling its transmission. The MMC believes that transportation contracts and charges can never be wholly transparent (otherwise it would not be necessary to divest BG Trading, it would only be necessary to create such transparent charges as BG has proposed) and therefore it is possible for BG to arrange favourable transport terms for gas from its own fields. BG therefore has the theoretical power to block a marginal field development from a competitor through the level of transportation costs but could develop its own field with otherwise identical economics by cross-subsidization. The only reference to this potential problem is the statement that "there were complaints that BG could use its position... to restrict competitors' ability to bring gas on shore or to increase transportation costs. There was not significant evidence that problems have occurred *to date* [my italics]... some concern was also expressed to us about the links between E&P and the transmission and storage system... It is clearly important that there should be adequate provision in future to ensure that gas is accepted for transmission on reasonable and non-discriminatory terms"(2.128). Perhaps this flaw will not be a problem in practice but, if it is, the government and regulatory authorities will be forced into facing the decision which this report ducks so deftly. Namely, do we wish to dismember a highly successful (and popular) international company in the pursuit of a "fair" gas market at home?

Another concern is the financial viability of the proposed trading company. Projections by BG and some city analysts conclude that the trading arm would be loss making by 1997 if it paid transportation charges as recommended by the MMC (See 2.188). The company would be no less profitable than as a combined supply unit but the separation of accounts, whereby the trading company would pay a transparent transportation tariff based on a 4-4.5% ROR to the pipeline business, demonstrates, it is claimed, that the current retail pricing formula (RPI-5) is too stringent for the stand-alone trading business to make suitable returns. BG pressed for an adjusted tariff of RPI-1 with pass-through of transportation costs. One possible scenario is that the government might accept the "benefits of competition" as argued by the MMC and

Ofgas but, in legislating the divestment, find it necessary to raise the price cap radically so that BG Trading can make acceptable profits. Thus, the establishment of a competitive market would result in the tariff customer paying more twice over - once for the pass-through of administrative costs for restructuring and secondly to improve the solvency of BG Trading.

The financial viability of a future BG Trading is vital since it would inherit all BG's long-term supply contracts with North Sea producers. These contracts contain substantial take-or-pay obligations which exist to provide security to the producers for their investments in gas field developments. The development of gas fields is riskier than for oilfields because they are less easily staged and their sales are less flexible: gas can only be sold to those at the end of the joining pipeline. Producers have covered this risk through take-or-pay obligations with a trusted and secure company. They are now aware that their investments could become dependent on a potentially insecure company with limited assets. There have been suggestions that the absence of a large and secure wholesale buyer of gas could undermine future exploration and development. Although the competitive market has encouraged the development of fields that would not have gone ahead if BG had remained the sole gas purchaser (2.130), these are small fields ideally suited to contract with the new marketers. It is known, for example, that the large Britannia field is anxious to sell to one large, reliable buyer and might prefer to sell abroad than to a BG "splinter" company.

Not all producers take this line. Some have long protested at the strength of BG in price negotiations and have wanted to market their own gas or to be approached by rival buyers. The MMC "noted the wide range of opinion from gas producers. Some producers felt competition increased risk and would inhibit exploration and production... and some suggested highly radical and innovative approaches to the re-structuring of BG"(2.130).

It is evident that all forms of breakup involve both gains and losses. Although the issue is complex, it seems that many of the advantages and drawbacks depend on who owns BG's asset base. The MMC's proposal seems a pragmatic solution: it is relatively cheap and BG retains the advantages of an integrated company. On the other hand, UK exploration and production could suffer from the element of greater risk.

But even if this is a preferred form of breakup, what is to be gained? This breakup is devised to create fair treatment between competitors, not to reduce consumer prices. Advocates argue that fair treatment is a *sine qua non* of self-sustaining competition and that competition in marketing will reduce costs and squeeze rent margins. However to an extent this was already happening, as evidenced by the fall in BG's rate of returns on net assets in the firm contract market.⁹ All that the proposed breakup will achieve is the equal treatment by BG Transportation of all marketers post-1997. (The favoured status of BG pre-1997 is of little significance since it is not allowed to compete itself and is engaged in trying to lose, not gain, customers.) Indeed one could even argue that BG will no longer see advantages in giving cheap transportation to itself and will instead treat everyone equally expensively. This explains why, under some scenarios, BG Trading could be forced to raise its prices. The marketers would have no cause to oppose higher transportation charges, since the cost would be equal to all, would be passed through to the consumer and could be blamed on the monopoly. We therefore conclude that any beneficial effect on consumer prices will be felt far more by the regulation of transportation than through attempts to construct a "fair", non-discriminating market for gas trading. With regard to the structure of BG, it would appear that the MMC has arrived at the least damaging form of breakup.

The Monopoly Threshold

Much of the headline news regarding the MMC findings reported that it favoured the removal of BG's monopoly over the domestic market. Although true, the significance of the MMC's conclusion is, first, that BG's operation of the monopoly was not found to be against the public interest and, second, that the monopoly should not be removed this century but should wait until 2000 or even 2002. This is cautious given that government ministers suggested last year ending the monopoly and many marketers believed an open market was imminent. Opponents of the open market are now arguing that the MMC has essentially killed the idea especially as there will probably be two general elections before the suggested reform date. Advocates argue that the MMC has accepted the principle of full competition and the government should accelerate the timetable. In the light of our conclusion above, it is in fact

⁹ According to BG figures quoted in Table 2.2 (2.16), RONA in the firm contract market has gone down every year since 1987/8, from 18.7% to 5.6%.

unclear why the MMC felt that "the removal of the monopoly should in our view follow measures to ensure the neutrality of the transportation and storage system" (1.9). The Coopers & Lybrand report, commissioned by Alliance Gas, Total Gas Marketing and Utilicorp, specifically placed a higher priority on entering the domestic market than restructuring BG.¹⁰

By opting for such distant reform, the MMC gave no details for the process, contenting itself that "removal should depend on the progress of legislative change, so as to impose obligations for safety and security of supply and social obligations on all competitors to the domestic market, and on the experience of the balancing of supply and demand by competing shippers in other sectors of the market" (1.9).

In the meantime, they suggest that the monopoly threshold should be lowered by 1997 to customers using at least 1,500 therms. Marketers and Ofgas are likely to see this as an unnecessary intermediate step (although one which offers a small number of potentially lucrative customers), whereas BG will view it as an opportunity for competitors to "cherry-pick" some of its most profitable customers and leave it to service the less profitable rump. Supplying large customers of gas is often more profitable because it involves lower unit costs which are not reflected in the uniform tariff. As we have seen, the MMC has already concluded that the loss to BG of highly profitable tariff customers in the 2,500 therm bracket has meant that its price formula (RPI-5) was no longer giving the company an acceptable return and should be modified to RPI-4. It is therefore quite logical that the further loss of profitable market in the 1,500 therm bracket will again lead to an upward shift in prices to the remaining customers. This provides another reason as to why it is conceivable an independent BG Trading may find itself raising prices.

This points to the crux of the matter: the removal of the monopoly threshold will lead to the end of the current charge system based on cross-subsidy. If a company is to lose customers who are paying in excess of their supply costs, that company will lower those prices to compete for those customers while raising prices for other customers given the increase in average supply costs. "Supply to lower-volume users (whose use of gas may be confined to

¹⁰ *Competition in Gas: Delivering the Benefits*, April 1993.

cookers or water heaters and who probably include a high proportion of elderly and poor customers) is currently unprofitable, and may require significant price increases" (2.109). A figure has been widely quoted by BG, the GCC and others that the end of cross-subsidies would lead to 12 million losers and 6 million winners but the figure appears speculative. BG claims that charges to the 1.4 million users of below 100 therms a year could almost double; those to the further 1 million users of between 100 and 200 therms could increase by almost 40%, and those to the further 1.4 million users of between 200 and 300 therms could increase by about 20%. The MMC calls these estimates "uncertain" but accepts that "some groups may be worse off than at present" (2.100).

The MMC justifies this re-adjustment of charges because increases would be in the shorter term "with the prospect of increased efficiency and price reduction in the longer term". Essentially the MMC holds it as axiomatic that the benefits of competition from reduced costs and squeezed rent margins will outweigh the loss from cross-subsidisation. No figures or arguments are readily identifiable to support this argument, and the logic is not obvious given the income distribution arguments involved. One might argue that it is only right and proper that people cover the costs spent on supplying them. Nevertheless, the idea would clearly be politically contentious in the extreme.

A re-adjustment of charges could also have a rebound effect. The level of tariffs for the pipeline system depends on throughput: if gas consumption rises, the pipelines can make the regulated maximum rate of return on lower tariffs; and conversely if consumption falls tariffs could rise. Therefore, if the removal of subsidies to some customers leads to a lower use of gas on their part or a switch to an alternative fuel, remaining gas customers would suffer from rising unit costs. This argument can be inverted: if the better-off were to respond to lower prices by raising consumption, the tariff could presumably fall. However, the cost plus charge will not necessarily maximize pipeline throughput and may therefore be expected to lead to some loss of economies of scale.

Some of these issues could perhaps be avoided through careful legislation and regulation. Certainly, the licence for a Public Gas Supplier (PGS) should include non-discrimination clauses. A PGS could have an obligation to serve a pensioner using 200 therms a year, just

as it serves the neighbouring mansion. Yet any PGS other than BG would have limited supplies and could not serve all requests based on published prices. The MMC report does not approach these issues but Ofgas has. Accepting that a PGS would probably not have the resources to operate with open-ended commitment, Ofgas suggested "the obligation to supply could be limited, at the supplier's request, to a particular geographic area - for example if a supplier wished to specialise in serving one city or region - but once a supplier was serving more than one area or in excess of a given number of customers (perhaps 500,000) the obligation to supply could become a national one".¹¹ This seems a realistic approach but it allows "cherry-picking" on a regional level. A marketer would be more likely, say, to choose Lincoln where transport costs from the southern North Sea would be lower than Plymouth, leaving BG as the residual supplier. Given the increase in the average cost of supply for BG's customers, remaining users would again have to pay more. However, it should be noted that since national transmission costs are relatively small (transportation costs are higher for lower pressure regional pipelines and distribution) such effects would probably be of limited magnitude.

A final problem with the removal of the monopoly threshold is the question of the availability of supplies. The introduction of competition into the contract market led to a rush by marketers to secure independent supplies. 77 per cent of their supply - 30 per cent of the firm contract market as a whole - comes from purchases of gas independent of BG (2.124), the rest coming from BG's release scheme. Should the far larger monopoly market be opened up, the process would be accelerated. There is already *prima facie* evidence that the rush to stake out market shares and contract the necessary supplies gave an upward pressure on beach prices, abetted by the "dash for gas" in power generation.¹² It would seem reasonable to assume that the potential number of marketers keen to enter the domestic market would lead to further upward pressure on beach prices. Moreover, the marketers would need to contract high swing supplies in order to service the seasonal swing of the domestic market. This gas is much more costly since the fields and offshore pipelines would not be used at full utilization other than

¹¹ Sir James McKinnon *The Gas Industry in Britain - Future Structures*, p.23, March 1993.

¹² The actual effect on beach prices, which are not published openly, is further confused because most sales are inter-company or involve a common equity link.

during peak winter periods. In fact, the hike in beach prices has been obscured because to date competitors have entered markets where they have only required to secure supplies of low swing gas, as have the power companies. According to the MMC report, "the average load factor of the customers of independent shippers is some 65%" (2.38), which compares to a load factor for national firm demand of 39%. There must be considerable doubt that new supplies would be competitive with BG's average beach price, if bought on high swing or on low swing with expensive storage costs.

New supplies would be limited and the problem would only alleviate with time as BG's long-term contracts gradually expire. In the meantime marketers have the alternative of release gas - after all BG has already contracted the volumes it believes necessary to meet national tariff market demand in the next few years - but this is sold on to them at a premium. The MMC's opinion was:

Some shippers argued that it might be necessary to extend the release scheme, or restrict BG's acquisition of gas, if it were decided to allow competition in the tariff market at a relatively early date. Such measures could have the effect of artificially limiting BG's market share, irrespective of the value of competition. It would be undesirable for there to be any such restraints on BG, or extension of the release scheme, at the time the tariff monopoly is eventually removed (2.126).

It is difficult to understand why this reasoning should not apply equally to the original release scheme.

Availability of supply is a key factor which distinguishes the gas industry from other utilities. A large proportion of gas supplies are contracted to BG under long-term and inviolable agreements. Even the more recent purchases by competitors involve long-term contracts. There is clearly only a limited amount of reserves which are left over and can be developed at competitive prices, and such reserves would in any case take at least three years to bring onstream. It would take many years before BG's proportion of supplies was brought into line with its reduced share of the domestic market and before competitors met their demand requirements fully through independent means. Even within the comparatively small firm market, competitors have struggled to find sufficient supplies, especially those without an upstream equity link. It is not surprising then that by 1998 most UK consumers will have no choice of gas supplier, although they will be able to choose their telephone company and

electricity supplier: the gas industry has supply constraints and lags not present in the other utilities.

There are in conclusion strong reasons why the MMC is right to be cautious about removing the monopoly threshold. The issues and implications involved need, as the MMC said, "careful assessment" and should not be overlooked in the general political enthusiasm for competition.

Setting Charges for the Tariff Market and Transportation

This is a highly technical area but also the one of crucial importance. It has been argued above that the effect on end-consumer prices will be determined far more by regulation of tariff charges than the imposition of a fair competitive market. On the other hand, it is clearly not equitable to keep prices down by enforcing an inadequate ROR for shareholders.

It is easier to comment first on the level of the tariff formula. BG accepted under duress a formula of RPI-5, that is the price cap should decline 5% in real terms each year. This represents a considerable stiffening on the former RPI-2, although this was widely condemned as too generous. BG was able to make good returns under this formula partly from cost reductions and partly by increasing domestic sales. Since the RPI-5 formula came into effect in April 1992, competition has been allowed into the 2,500+ therm market. This market represents much of the most profitable business and means that BG's declining market share will no longer be able to achieve the ROR intended when the formula was set. BG's claim that Ofgas should renegotiate the formula in the light of changed regulatory rules was accepted by the MMC.

It is more difficult to pronounce on ROR for the pipeline business. The ROR on monopoly sunk cost assets has long proved the most vexed of regulatory issues. BG, Ofgas and the MMC between them have already proved that figures can be generated to produce almost any rate of return. The MMC emphasized the importance of transport charges. Marketers have on average a gross margin of 12.1p/therm while transportation costs averaged 8.4p/therm. This leaves a margin of 3.6p/therm which is 11 per cent in terms of the average selling price of

31.7p/therm (2.40). If transportation charges rose much above their present rate, based on a 4.5 per cent return, the margins would be squeezed. The MMC wrote "the benefits [of competition] could, however, rapidly be reduced or removed if BG were significantly to increase its transportation charges *without corresponding increases in its own price schedules*" (my italics)(2.42). This appears to identify advantages in competition, even if it were to involve price increases across the board. The consequences of a higher ROR could be that BG price schedules would rise to maintain sufficient margins so that rival traders could continue to compete. As a result, BG trading would be even less likely to make an acceptable ROR on the current tariff formula (given that there is no provision for pass-through of extra transportation costs). Although it is not being suggested that the MMC gave undue regard to BG shareholders, it is undeniable that the goal of a competitive system which purports to generate lower prices depends on a ROR no higher than the presently employed one of 4.5 per cent. If the MMC had felt that 6-8 per cent was an appropriate return, where would this have left the claim that competition brings lower prices?

BG argued in its post-MMC report press release that the proposed ROR will have adverse consequences for its investments at home and overseas. Again regulatory decisions on the home front have repercussions on BG's internationalization.

The Market Share Targets

BG agreed with the OFT in March 1992 to reduce its share of the contract market to below 40% by 1995, excluding gas used for power generation and feedstock. (It is worth pointing out that BG's market share is less if power generation is included since most power stations are to be fuelled by their own independent supplies.) At that time the contract market was synonymous with the competitive market and BG would, presumably, have expected to keep all of the tariff market. However, with the passing of the Competition and Service (Utilities) Act in August 1992, competition was extended to customers using above 2,500 therms. As a result BG found itself mandated to lose 60 per cent of the contract market and, in addition, was losing market share in the tariff market. They could have competed more effectively with the rival traders in the tariff market by giving customers contracts which offered better terms than those available from the tariff. BG feared, however, that these customers would then be

classed as part of the contract market and thereby increase the volume of sales to be shed. It is quite appropriate that loss of market share in the enlarged competitive market should count towards BG's loss of share target. Thus the loss of market share is to be re-set as 45 per cent of the competitive market, which corresponds to the same volumes as 60 per cent of the contract market.

Such a redefinition is logical but does not come to grips with the fundamental problem, that of the interruptible market. Interruptible sales in 1992 amounted to over 95,000 GWh and accounted for about 40 per cent of contract sales. BG could only comply with the OFT requirement by losing some interruptible sales or by losing its firm sales in their entirety. Yet interruptible sales would give marketers negative margins and, without marked price increases, it is difficult to see them bidding in this market. BG is able to provide interruptible contracts because the sales are an economic means of covering peak winter demand from the residential sector. One obvious solution suggests itself - allow competitors into the residential market - but the drawbacks to this have been given above. Instead the MMC has put forward its revised market shares to give BG greater flexibility. The revised market shares, however, still involve an overwhelming percentage loss of the non-interruptible market, assuming the interruptible market remains the sole preserve of BG. It cannot be an effective form of competition to force one player almost completely out of the competitive firm market but compel it to retain a *de facto* monopoly over interruptible sales. Although the MMC identifies interruptibles as "a particular problem" it provides no solution.

One pragmatic solution would be to remove interruptibles from the percentages for market shares and accept that a *de facto* monopoly in the interruptible market is the direct consequence of a monopoly in residential supply. The MMC found that "despite the lack of competition BG, in effect, appears to be offering users low prices combined with a low probability of being interrupted... there is insufficient evidence to establish that any aspects of the supply of interruptible gas... can, in themselves, be regarded as against the public interest" (2.75). The interruptible customer is the user most able to switch fuels so that, though there may be a lack of gas-to-gas competition, low prices may be the result of keen inter-fuel competition. The interruptible market would seem, therefore, to operate sufficiently well in the absence of gas-to-gas competition.

BG has produced its own proposal for a market in peak gas.¹³ The idea is straightforward: BG would no longer contract sufficient gas to cover peak demands as it always has in the past; it would buy this peak demand from competitors (or BG Contract Trading) and the premium rates paid for peak gas will enable the other shippers to offer cheap interruptible gas contracts. They would be cross-funding interruptibles through peak household sales, just as BG does.

The peak market idea is a device that allows BG to maintain the domestic monopoly but, at the same time, allows the opening up of the interruptible market. Since the MMC has in effect suggested just that - the monopoly is to be maintained this century but interruptibles are to be included in market share reductions - such a scheme would appear to have a realistic chance of coming to fruition.

The Regulatory System

The operation of the regulatory system was itself an issue in the enquiry. The unparalleled step taken by BG to request referral to the MMC is an indication of the company's dissatisfaction with what it perceived as extreme and over-zealous regulatory interference in its operations. BG believed not only that the determinations of Ofgas were over-exacting and left no means of appeal other than through the MMC, but also that an overlap of responsibilities between the DTI, the OFT and Ofgas was producing uncoordinated and fragmentary regulation. The way in which tariff formulas were negotiated with Ofgas and market shares, independently, with OFT is a case in point.

The MMC concludes that "the regulatory system established by the Gas Act is, in our view, fundamentally sound and the difficulties in the regulatory exchanges over the last two years are probably exceptional" (2.222). They argue further that their proposal to split BG's trading and transportation businesses will remove a major source of conflict.

However, the early signs suggest otherwise. The MMC report is likely to set off far more

¹³ BG *Creating a Market in Peak Gas*, May 1993.

quarrels than it has solved and the battle-lines are already emerging. For instance, can Ofgas, with its statutory obligation to defend the interest of consumers, accept that tariff charges should rise to compensate BG with loss of market share, or that the costs of restructuring be shouldered by the consumer? Does the MMC report reject lifting of the monopoly threshold for the foreseeable future or has it endorsed the principle? Is BG Trading a viable concern on a stand-alone consideration? Will Ofgas and BG reach agreement on the price formula to be used to give BG the recommended ROR on its pipelines? The MMC has also steered clear of individual concerns: "a range of technical issues relating to gas supply was raised with us, including the structure of transportation charges and the operation of the network, which can in our view be better pursued by the Director" (1.16). Several contentious issues have then in effect been returned to Ofgas or the DTI.

Guarantees to Shareholders

One objection to the MMC report is that it overturns guarantees made to BG shareholders in the privatization brochure. These include that BG would retain its structure as an integrated gas supply business and that it expected to remain the sole supplier of the domestic market. At the time of privatization, the government was able to choose between various options for the structure of BG and it opted for a single integrated business. Legislation which changes this status may be challenged in the courts.

We will not argue the legal technicalities. Suffice it to say, shareholders must have legal recourse to defend their interests when they feel they are infringed. It is understood that there would be little precedent for such a legal challenge. Whatever the legal position, we believe that it would be unacceptable that governments and regulatory authorities have their hands tied and that, should a system after lengthy review be considered detrimental to the public interest, there ought to be a form of remedy. It was clear at the time of privatization that BG would have its own regulator and would be subject to the general strictures of fair trade legislation. The problem is that, whereas consumers have recourse to extra-judicial fora for appeals and are protected by watchdog bodies, the same cannot be said of the shareholder.

Conclusion

The UK has one of the highest levels of gas penetration in its energy balance of any country in the world. Only Holland within the EC has a higher percentage dependence. The UK is also the second biggest consumer of gas, behind Germany, in Western Europe and its consumption is set to expand rapidly over the course of the decade. The upstream side of the business is undergoing a boom with record levels of production, upward appraisal of reserves, high capital investment and a flurry of new gas field developments. The downstream business has a first-class safety record, has continued to increase the number of household connections by about a quarter of a million each year and is shown, according to surveys, to provide good and reliable service in the opinion of consumers.¹⁴ Prices to the tariff market have declined 20 per cent in real terms since 1986; prices to the interruptible market were praised by the MMC as "low"; prices in the firm market have been brought down by competitors with the claim of a £100 million saving to the economy. International price comparisons, although less clear-cut, would not seem to suggest that prices are in general higher in the UK than on the continent; the reverse is more likely. At the same time, over 2 million shareholders have benefited from an appreciating share price and dividend pay-outs.

Certainly there is a great deal of tension between BG, new market entrants and the industry regulator. Ofgas has fought a difficult but successful battle to restrain BG's market power, for instance its intervention to keep transport charges down and to tighten the original lax tariff formula. BG has understandably sought clarification or arbitration of issues. The marketers, too, need clarification of the future parameters for their business. The relations between the marketers and BG have been generally poor, with complaints of inflexibility of contract terms, uncertainty over future transport charges and inefficient meter reading leaving the marketers unsure of their liabilities.

These concerns are legitimate and required consideration and resolution. It is less obvious that they require further restructuring of the industry or the embarking on a market-based experiment without parallel or precedent in the world. In this vein, the Gas Consumers

¹⁴ See, for example, MORI for the National Consumer Council, March 1991, and MORI for the Office of Water Services, May 1992.

Council has written "in judging any proposal for radical change, from whatever quarter and however strongly promoted, we ask the very simple question, 'Has it been shown that the change will be better for the consumer?' Only if the answer is 'Yes' will the proposal have our support".¹⁵ The MMC report does not *demonstrate* any benefit to the consumer: it only *asserts* that the general principle of competition ought to have benefits to customers *overall and in the long term*.

The benefits of competition are said to be choice, innovation, improved service and price. However, in the case of a homogeneous commodity such as gas which allows no product differentiation, price is of primary importance, and choice in itself is of little value unless it delivers lower prices. Innovations such as hourly or seasonally variable tariffs or different standing charge/commodity proportions are only attractive to the consumer if they reduce costs. Service is of lesser importance provided that all gas companies are subject to general standards of security of supply, as they should be. Consumers are already free to choose who should install or repair their gas appliances.

Advocates of competition in the gas industry claim it reduces price and their arguments rest on two main principles. Firstly, competitors are forced to pare down costs to a minimum. The suggestions that the new marketers have lower overheads, that their load balancing is of necessity more rigorous and efficient and that they are more willing to tailor contracts to customers' needs than BG are convincing. Industry costs can doubtless be further cut. Secondly, competitors run on the lowest competitive margins. A recent report has concluded that BG is by far and away the world's most profitable gas transmission and distribution company, which would certainly suggest there are rent margins for would-be competitors to target,¹⁶ (or at least that there have been in the past).

On the other hand, there are a number of arguments against competition, which have been expressed in various parts of this paper. These are essentially two-fold: the adjustment to a

¹⁵ GCC 1992 Annual Report.

¹⁶ Sheffield Energy & Resources Information Services, *Natural Gas Companies Worldwide*, 1993. Profitability was rated on a mix of total operating profit, return on assets and operating profit relative to pipeline throughput. See *World Gas Intelligence*, April 1993, for details.

competitive market is painful and the *sui generis* features of the UK gas business mean competition may not bring significant gains.

Transition is painful because it involves moving to a different charge structure and the elimination of cross-subsidies. "An increase in competition in that market may well result in a change in the structure of prices, with a closer relationship to the structure of costs" (2.70). This change is doubly difficult because those who will lose out are those least able to pay any increase, the elderly and less well-off, and energy prices are already the focus of intense political unease after the plan to charge VAT on domestic bills. The level of these cross-subsidies is hard to gauge but it is unconvincing that the benefits of cost reduction would, *ceteris paribus*, ultimately outweigh the effects of cross-subsidization and make everybody better off.

Some unique features of gas in the UK which have a bearing on competition, stem from the facts that there is no uniform beach price for gas and that gas is not readily tradable on a prompt basis. All gas supplies are sold by producers through contracts, normally long-term, including a pricing formula with negotiated base prices and indexation. Prices vary depending on the date when the contract was signed. Most supplies are contracted to BG and, although the volumes are declining, many will continue to be contractually bound up well into the next century. This has two important implications. First, the gas costs of BG need not be the same as for competitors. If the price of new gas supplies were to rise above BG's average contracting price, it would be very difficult for the marketers to compete. So long as the marginal price for gas remains below BG's average beach price, marketers can undercut relatively easily without needing to trim costs or squeeze margins. Secondly, the volumes available to the market are limited. Once competitors have sold their portion of supplies, BG would become the residual supplier for the remaining customer base and would be in a position to set virtual monopoly prices.

Finally, competition forces prices up at the beach as a multiplicity of buyers replace the monopsony of BG. This is clear both from the base price agreed in new contracts and the renegotiation of expired contracts. The upward movement of beach prices has been obscured because of the confidentiality of contracts and, perhaps, because of a misunderstanding of the

difference between the marginal price for contracting new gas supplies, which has risen sharply over the last three years, and the published average beach price which is rising less quickly. Furthermore, although the marginal price has risen significantly, a greater increase has only been avoided because most purchases were of cheap low-swing gas and have been made between parties with corporate links. Rent margins can be squeezed from both ends: they are likely to be squeezed at least as much from paying higher beach prices than by cutting retail prices. There is then a *prima facie* case that rent from savings in the trading of gas is being allocated upstream to producers, rather than to end-consumers.

In conclusion, the benefits from a competitive market in gas in the UK are not clear-cut. There is good reason to think the introduction of further competition will bring few gains while creating significant losses. The dismemberment of BG threatens a successful and international company without offering proven benefits. The abolition of the domestic monopoly involves complex and contentious issues which remain to be resolved. Given the present functioning of the gas business and the low priority attached by the public to reform, it would be unwise of the government to produce any major changes in response to the MMC report. Other than on purely ideological grounds, there appears to be little justification for seeking greater liberalization of the UK gas market.

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