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THE RESULTS OF UK ELECTRICITY PRIVATISATION

by Colin Robinson

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1. Introduction

In January 1988, a memorandum on Privatising Electricity Supply was submitted to the Select Committee by Allen Sykes and by me (1) based on studies of electricity privatisation options carried out before the government's privatisation plans were announced in February 1988 (2). Our principal conclusion was that there should be "an early and assured breakup" of the CEGB establishing five or six large generating companies and a separate transmission company: the eventual structure of generation would include numerous smaller generators. Competition in generation would ensue, enhanced by imports of electricity into England and Wales from France and Scotland, leading to competition in supply since consumers would be able to choose among a number of supply sources.

Electricity consumers would, we argued, benefit from such a competitive regime. Moreover, it would be possible to liberalise and privatise the British coal industry, leading to greater efficiency, increased demand for British coal and less pit closures than under continued nationalisation.

The privatisation scheme which the government implemented was much less liberal than our proposal. Transmission was separated from generation, which was a necessary but not sufficient condition for competition in supply to develop. However, the rest of the CEGB (essentially its generation activities) was divided into only two parts. This minimal division was a consequence partly of the CEGB's strong resistance to any breakup and partly of the government's wish to establish one very large generator (National Power) which it hoped would carry forward a nuclear power programme and within which it evidently believed it could bury away existing and troublesome British nuclear power stations (3). In 1989, the government was forced to withdraw nuclear power plants from its privatisation plans; nevertheless, it did not take the opportunity to split National Power and PowerGen.

This memorandum replies to the Clerk's letter of October 2nd, concentrating on three matters relevant to the Committee's inquiry. First, it considers the potential benefits of electricity privatisation and what determines whether or not they will be realised. Second, it analyses some flaws in the privatised structure. Third, it suggests some ways in which the present regime could be modified in order to realise the potential benefits of privatisation. The main focus of the memorandum is on the extent to which competition has been or could be introduced into the electricity supply industry since injecting competition was one of the government's prime aims in privatising the industry. According to the White Paper on electricity privatisation, "The new structure will introduce competition and provide a framework in which more will develop" (4).

To place the memorandum in context, I should say that my view is that in British conditions there is little to commend a policy of privatisation per se. The unsatisfactory performance of the nationalised industries arose primarily for two reasons - incessant political interference with their activities, and monopoly which led to technological backwardness and unresponsiveness to consumers. The first problem will to some extent be solved by privatisation since, in any form, it is likely to reduce the politicisation of decisions. But the second is not necessarily touched by privatisation which may simply result in the transfer of monopolies from public to private sector. Private monopolies may have lower costs than state monopolies if there is effective shareholder pressure for efficiency (which means avoiding devices which restrict the threat of takeover such as "golden shares") but, in the absence of competitive pressures to pass on cost reductions in lower prices, there is no reason to expect consumers to benefit.

If privatisation is to lead to economic benefits which more than offset its costs (in terms of the resources devoted to planning and then implementing the restructuring of the industry), monopoly power needs to be undermined by the introduction of competition into the markets where the previously nationalised corporations sold their products. In other words, privatisation should be accompanied by liberalisation of product markets. The main argument for privatisation is that it provides the quickest and most effective means of liberalisation in many markets,

especially those, like electricity supply, which under state ownership had very well-entrenched incumbents.

2. Comparison with the nationalised regime

How one judges the new regime in electricity supply depends on the comparator. Compared with what could have been achieved, it has many deficiencies. But compared with the nationalised electricity supply industry it is, in my view, potentially a big improvement. Under nationalisation, a monopoly generator (the CEGB), subject to constant political manipulation, dominated a cost-plus industry which gave no choice to consumers. Efficiency pressures were minimal, costs were excessive (as demonstrated by the ability of the new generators to cut labour costs and reduce surplus capacity) and price signals were weak.

Compared with the nationalised industry, there are three main sources of potential economic gains under the imperfect new regime.

First, there are the benefits to be expected in a move away from monopoly and towards competition. With some competition in generation and supply, where previously there was none, the result should be more entrepreneurship and increased managerial and technological innovation leading to lower costs, and to lower prices, better service and greater security of supply for consumers. Economies already achieved demonstrate that privatised companies operating under more open regulation will be more cost-conscious than were their predecessors. Moreover, despite the restrictions so far imposed on competition in supply, some industrial consumers have gained in terms of lower prices and improved conditions from their new ability to choose among competing suppliers: according to the Director General of Electricity Supply, a "good proportion" of the members of the Major Energy Users' Council enjoyed price reductions of up to 20 per cent and there has been "more flexibility and innovation" in the terms offered (5). In general, efficiency gains are likely as competing suppliers provide consumers with price signals which more closely reflect the costs of supply than was the case under nationalisation and as transmission and distribution charges also become more cost-reflective (providing better locational signals).

Second, the new regulatory system is, in principle, an advance on what went before. Nationalisation is itself a means of regulation, but in Britain it had many weaknesses (6). Despite the good intentions of the founding fathers such as Herbert Morrison, it proved impossible to have "arms-length" relationships between the nationalised corporations and government. Instead, governments of both major parties found irresistible the temptation to interfere with the decisions of state-owned industries so that, in practice, the corporations had little control over pricing and investment decisions, their managements became demoralised and the quality of management suffered. There were constant clashes as corporations formed objectives which differed from those of politicians and civil servants. The rules of the game were continually shifting as Ministers and civil servants did behind-the-scenes deals with senior managements of nationalised corporations. Political interference was a particularly serious issue in the nationalised electricity supply industry where governments influenced the industry's fuel inputs as well as its prices and the size of its investment programmes. An independent regulatory body is capable of providing the industry with a much clearer set of ground rules which avoids much of the confusion between commercial and political objectives associated with nationalisation.

Third, a very important indirect result of electricity privatisation is that it has already changed British energy policy in a way which, though it could have occurred under continued state ownership, would almost certainly not have happened at such speed. Until recently, the twin pillars of energy policy in this country were protection of the nationalised coal industry and promotion of nuclear power (7). Policy was implemented principally by twisting the arms of leading figures in the electricity supply industry who had little incentive to resist since their market power allowed them to pass the costs of protection on to their consumers. The old protective regime is crumbling fast now that electricity supply is in private ownership and arm-twisting has become more difficult (though not impossible, especially while the government still holds 40 per cent shares in the two major generators).

I would conclude that the potential gains from the new regime are considerable. But the only potential gains so far realised to any significant extent is the third (benefits from a change in energy policy) and it is still uncertain whether

protectionism will revive. Whether the other benefits accrue depends critically on the extent to which competitive forces are actually unleashed. That in turn, as explained below, depends on whether new entrants are attracted to electricity generation and supply. One considerable advantage as compared with nationalisation is that entry to the industry is no longer impossible. Nevertheless, because entry is still difficult one cannot be sure to what extent genuine competition will emerge.

Competition is important not only directly to consumers but also indirectly because its presence or absence will influence the success or failure of regulation. A good feature of the privatisation schemes for British utilities is that they impose on regulators a duty to promote competition so that they can attempt to "grow" competition over time. But if regulators are to perform this task and others effectively they need to have a manageable area of activity. If they start from a position of minimal competition, their task is rendered unnecessarily difficult (perhaps even impossible in a complex industry such as electricity supply) because they have to try to inject competition into places where the government could have introduced it in the first place.

3. Emerging problems in electricity privatisation

In my view, the biggest flaw in the electricity privatisation scheme - and the root cause of most of the problems now discussed at such length in the electricity trade press - is the scheme's failure to create conditions in which there is a high probability generation will become a competitive industry, leading naturally to vigorous competition to supply consumers. A closely connected though wider issue is the failure of electricity privatisation to disturb the old network of relationships in the electricity supply industry.

The initial structure of generation is the worst aspect of the scheme and the one which most urgently needs correction. The dangers of leaving generation as a monopoly or transforming it into a duopoly were explained in our 1988 memorandum: they are discussed below in the light of present circumstances.

3.1 Will the duopolists compete?

Economists no longer lay such stress on the structure of an industry in determining its conduct and performance as they once did. In some markets, the structure of the supplying industry - the number of firms and the extent to which market shares are concentrated in a few hands - is a relatively unimportant determinant of whether or not it behaves competitively. A market can be "contestable" even if it is apparently dominated by large firms, provided conditions allow newcomers to enter and exit the industry freely. If there is a constant and credible threat of entry, the incumbents will behave as if they were in competitive conditions: their behaviour will be determined by potential as well as by actual competition. In the privatised electricity supply market in Britain, however, the duopolistic structure of generation both inhibits competition between the incumbent generators and deters entry.

Duopolists have a strong incentive to collude in an industry such as electricity supply in which, because of the absence of close substitutes over a substantial part of the market, total market demand is relatively insensitive to price in the short to medium term (8). The demand for the product of each duopolist is, however, very price-sensitive since they offer identical products (though the terms of supply may differ). It is thus very attractive to duopolists in such circumstances to suppress competition between themselves and, in effect to take advantage of the inelasticity of market demand. There need be no explicit agreements not to compete; such agreements would indeed be illegal. Tacit collusion is much more likely in which each firm avoids open price competition because it believes that to be in its interest. Moreover, each duopolist may have some general awareness of the other's cost conditions which helps in forecasting price behaviour (though at times there may be inadvertent price wars).

The privatised electricity supply industry is a special case of duopoly in which vigorous competition is even less likely than usual because National Power and PowerGen have a common origin and must have more knowledge than most of each other's likely costs and likely behaviour in different circumstances. Thus, it is more straightforward than in most duopoly situations to forecast competitive actions and reactions and tacit collusion becomes more likely. Competition from outside the

duopoly, in the form of newcomers, is needed if the benefits of competition are to emerge.

3.2 Import competition

Increased imports could eventually be an important source of extra competition for generators and suppliers of electricity. However, though I believe that restrictions on trade in electricity should be avoided, it is unlikely - because of the planning period for new import links - that increased imports will be a significant influence on the market in the next few years. Additional imports could come from France (with an increase in capacity of the present link from 2GW) or from Scotland (via the higher capacity interconnector now planned) into the English and Welsh system. Although a strengthening of the Scottish interconnector is welcome, it is doubtful whether competition just from that source will be very significant partly because the supplies will be marginal and partly because effective competition is more likely to come from newcomers rather than from existing companies.

3.3 The need for entry

One reason why entrants (without strong links to existing companies) are needed in electricity generation and supply is that they would create the rivalry and disturbance of the industry which are essential features of a competitive market. Competition from within the existing industry is unlikely to be as effective. An unfortunate feature of the electricity privatisation scheme, which compounds the effects of the initial duopolistic structure of generation, is that it did not do enough to change the structure of relationships which existed under nationalisation. Although relationships which used to involve cooperation within the same organisation have now apparently been replaced by contracts between different companies, in practice the "new" companies are all descendants of their nationalised predecessors and many previous managers are still in place. Without entrants there is, for instance, no equivalent in electricity supply of an "outsider" such as Mercury in telecommunications. Nor did privatisation include any trade sales which might speedily have introduced large numbers of new managers.

3.4 Entry to generation

In considering entry prospects, I concentrate on entry to generation - which would be likely to increase competition both in generation and in the supply of electricity to consumers - though I recognise that there might be some entry by companies without generation facilities which wished to supply consumers. It is, of course, in generation where the bulk of the industry's costs are incurred: fuel, labour and other costs of generating electricity accounted for over 70 per cent of the industry's costs at the time of privatisation (9)

It is fortunate that electricity privatisation coincided with a number of other developments which made entry to electricity generation easier than it had previously been. Advances in technology have produced a range of gas-fired turbines which offer low capital costs and short construction times (three years or less), relatively high efficiency (50 per cent or more for combined cycle gas turbines or CCGTs), and less adverse environmental impact than other existing fossil fuel plant because sulphur emissions are virtually absent and carbon dioxide emissions are much less than for coal or oil plant. The relatively benign environmental impact of the CCGTs has turned out to be a crucial factor because of the need to meet EC environmental regulations. Once the government's de facto ban on the use of gas for power generation was dropped (10), investment in such plant offered potential entrants an opportunity to compete with existing generators. In sum, changes in technology, in views about the environment and in government policy have combined to reduce the minimum efficient scale of electricity generation, permitting entry to the industry by companies using a variety of plant sizes though all less than the 2GW previously favoured and all using natural gas as fuel (except for the new waste and renewable projects).

3.5 Incumbent disadvantages

Unlike incumbents in many industries, the two major generators have the disadvantage that at the time of privatisation they had mixes of generating plant which differed significantly from those they would freely have chosen. Indeed their initial plant endowments had not been freely chosen by their predecessor, the CEGB; governments of both major parties had for many years played a large part in

determining what types of plant should be built, as part of their policies of protecting coal and promoting nuclear power.

Nuclear power has been left in the public sector. But government policies have made National Power and PowerGen unduly dependent on large relatively polluting coal-fired stations and, under the extension of the previous "Joint Understandings" up to March 1993, they have a period of continued dependence on British Coal. Their inappropriate plant mixes undoubtedly constrain their activities for a time though temporary dependence on British Coal appears to be offset by their ability to pass on the costs to consumers.

Both generators are keen, for cost and environmental reasons, to diversify generation technologies and sources of fuel supply. Consequently, they have so far had less freedom in pricing than strong incumbents often enjoy when a high proportion of their costs is already sunk. Both National Power and PowerGen need to invest in new port facilities (to import low sulphur coal), in flue gas desulphurisation (to allow existing fossil fuel stations to meet environmental requirements) and in gas-fired plant (11).

Without doubt, in the early post-privatisation period the problems which the two major generators faced in adjusting their plant mixes to the needs of the 1990s opened up an opportunity to enterprising newcomers to move into the market. It is, however a sobering thought that if improved CCGT technology had not been available (or if the British government had maintained its ban on the use of gas for power generation), there might have been no new entrants whatsoever to power generation in Britain. Not many organisations would have been willing, in the face of the entry barriers listed in 3.6 below, to attempt to penetrate the British market by building large coal-fired power stations with long and uncertain construction periods and subject to environmental regulations which might change fundamentally during the construction period.

In the event substantial entry is occurring. So far as I can tell from analysing announced plans to build new power stations (12), around 5GW of "independent" CCGT capacity (approximately 8 per cent of present capacity in England and Wales) can be regarded as firm, including the large (1.7 GW) power station on Teesside and Lakeland Power's recently-commissioned 220 MW Roosecote plant. The degree of

"independence" varies: most newcomers have some form of association with existing organisations in the electricity supply industry. Possibly as much capacity again is planned though not yet firmly committed. The scale of entry is such that it may well result in increased excess capacity in the next few years, though that will depend partly on the rate of closure of Nuclear Electric's aging Magnox plants.

3.6 Barriers to entry

Despite the volume of entry to the market so far, one should beware of assuming that it will continue (or that all existing entrants will survive). The incumbents have some formidable advantages as well as the disadvantage of their initial plant endowments, and newcomers are likely now to perceive significant obstacles to entering the market. Some of these barriers to entry are listed below.

Despite their inappropriate plant mixes, National Power and PowerGen have the advantage as incumbents that they already have sites for power plants, contracts for fuel supplies and contracts to supply electricity, and that they can readily raise finance. Potential entrants, by contrast, know that they will have to put considerable resources into finding sites, obtaining planning permission, negotiating contracts and securing finance even before they incur the substantial costs of constructing power stations.

Another advantage of the incumbents which is not to be under-estimated is their knowledge of how the new privatised regime works; there is already something of an information monopoly among a small number of companies which understands the rather complex pooling and settlement system. A potential entrant, wishing to estimate the likely net present value of a power generation project in England and Wales, has to invest significant resources in trying to overcome the deficiency of information from which it suffers in comparison to incumbents.

Potential entrants are bound to incur substantial entry costs, to overcome these incumbent advantages, which they will be uncertain about recovering if they decide to leave the market. In other words, not only do they face high entry costs but if they decide to leave the industry there could be high exit costs too (depending on the price at which they can sell their assets). The market is therefore not contestable in the economists' sense (3.1 above).

High entry and exit costs are, however, not all. Uncertainty about the sizes of both costs and of revenues from selling electricity will affect the willingness of potential newcomers to enter generation.

On the revenue side, potential entrants (other than those which already have contracts for their electricity) at present face considerable uncertainty about both the quantities of electricity they will be able to sell and the prices they will realise. They know that the very strong market positions of National Power and PowerGen would allow them to manipulate the market (either volume or price) should they wish to do so (13) and not be checked by the regulator or the competition authorities. It would, for instance, be possible for existing generators to over-invest in new capacity in order to pre-empt market share which entrants would otherwise have taken. Similarly, sharp variations in pool prices resulting from action by existing generators could deter would-be entrants by causing uncertainty about how prices will move in the future. I am not arguing that such behaviour is or is not occurring (though pool price variations are at present being investigated and both National Power and PowerGen are investing heavily in CCGT plant, at the same time closing old plant): my point is that because potential entrants know that National Power and PowerGen have such powerful market positions that they could act in a predatory fashion, uncertainty is increased and the chances of entry are diminished.

On the cost side, apart from the usual uncertainties in moving into a new market, a very significant problem for "independents" which appeared only in 1991 is uncertainty over natural gas prices. Firm plans for independent generation all appear to have been formulated at a time when the companies involved were confident that CCGTs would have a considerable competitive advantage over the coal and oil-fired plant which for some years will constitute the bulk of existing generators' the capacity. At that time, gas supplies for power generation were available at 16-18 pence per therm, giving an estimated generation cost of less than 2½ pence per kWh (14) compared with some 3½ pence for new coal-fired plant fitted with FGD and using British coal and just over 2½ pence for operating costs and the costs of FGD at existing coal plant.

So potential entrants would have expected a considerable competitive advantage in terms of lower fuel costs which would more than offset the incumbent

advantages of National Power and PowerGen. Now that gas prices for power generation have risen to approximately 20 pence per therm for 1995-96 supplies and about 21 pence for 1996-97, with escalation clauses which will almost certainly take prices substantially higher before plants could begin to operate (15), and now that British Gas is limiting supplies, potential entrants are bound to feel more cautious about whether they can compete with incumbents which have significant advantages including contracted gas and the ability to manipulate the market against newcomers. The uncertainties are increased by the public disputes between British Gas and Ofgas and by the legal actions now pending in the gas market (16). Although British Gas has only about one quarter of the power generation gas market, its powerful market position in gas generally and its control of the pipeline network have been significant factors in restricting the development of gas supplies from the British North Sea. The government's insistence that overseas trade in gas be tightly controlled has also been unhelpful since, under a more liberal trade regime, there would certainly be more imported gas flowing into Britain now.

4. Policy now

For the reasons explained in this memorandum, the stimulation of entry to generation and supply is crucial to the success of electricity privatisation. Without continuing entry and the threat of entry, the vigorous competition needed if there are to be benefits from privatisation is unlikely to emerge. It is very unfortunate that the government did not make a finer split of the CEGB when it privatised the industry. Had it done so, there would have been far fewer problems to deal with now. The initial structure of the industry would have been more competitive and entry would have been easier.

It is encouraging that so many firm plans to enter the market were made in the early days of privatisation. It says much for human ingenuity that, once the previously insurmountable barriers to entering electricity generation were lowered a little, a number of companies found ways of moving into the market. Nevertheless, there is a danger that, in retrospect, the initial surge of entry will appear as a passing

phenomenon stimulated by conditions which did not persist - that subsequently, few companies ventured into the market and some of those which had entered departed.

Policy should, in my view, be directed primarily at avoiding such an unfortunate outcome. I would make the following suggestions.

4.1 Breaking up the generators?

Some minor changes might be helpful in easing entry to generation - such as insisting that the major generators offer for sale power stations which they intend to close. But more fundamental steps also need consideration. If entry to generation is indeed being deterred by the presence of the duopoly, one of the principal aims of privatisation is at risk. Assuming that the government still wants a competitive market, it should be prepared to order an inquiry which might lead to a break-up of the two major generators. The combined share of the two companies - now about 75 per cent of capacity in England and Wales - may still be 55-65 per cent by the end of the century, leaving them, according to the Director General of Electricity Supply, still in a "dominant market position" (17).

For obvious reasons, the government will be reluctant to split the generators or take other radical action to change the structure of an industry so recently privatised. There is, however, a lesson to be learned from experience with gas privatisation. After British Gas was privatised as a monopoly, the regulator - backed up by recommendations from the Monopolies and Mergers Commission - spent several years trying to coax the company into behaving competitively despite its massive monopoly power (considerably greater than that of the two major generators). The attempt did not work and the government, following an Office of Fair Trading report (18), now seems on the verge of more radical action to bring competition to the gas market (19).

4.2 Spillover benefits from a more competitive generating industry

Two important spillover benefits would result from a more competitive generating industry. First, an obstacle to an appropriate form of coal privatisation would be removed. If there were no longer dominant generators, it would be easier to

establish several competing coal companies and there would probably be considerable interest from trade buyers in investment in the British coal industry (20).

The second advantage is that regulation of generation would be avoided. It is sometimes suggested that the generators' power can be curbed by continuing supervision by the Office of Electricity Regulation. It would, however, be costly and ultimately ineffective to attempt to do by regulation (which is always an unsatisfactory substitute for competition) what can perfectly well be accomplished by introducing competition into a sector where it could flourish. With a competitive generating industry, there would be no need for regulation of generation by OFFER (other than general oversight to ensure that competition is maintained). Regulation of the electricity supply industry would then be confined to sectors of the industry which, with present technology, are "natural monopolies" (essentially the "wires business"), leaving competitive forces to safeguard consumer interests in generation and as much of supply as possible. At present, the regulator seems overburdened by having to supervise virtually all the activities of an industry where competition has not yet made firm roots.

4.3 Increasing competition in the gas market

Finally, for competition in electricity generation and supply to flourish, it is particularly important that the government should increase competition in the gas market by making the changes recently suggested by the Office of Fair Trading which Ministers have evidently accepted in principle (21). Because CCGTs are the preferred technology for new plant, the electricity and gas markets are now closely linked. After the events of 1991, potential entrants to power generation may well be deterred by doubts about the availability and price of natural gas. A competitive market for gas, in which natural gas producers in the North Sea and elsewhere have access to British consumers via an independently-owned pipeline system, is essential if supplies are to be increased and prices are to be held down compared with the present monopolised market in which British Gas, five years after privatisation, is still rationing out "its" gas. Without early action to liberalise the gas market, whatever changes are made in the electricity supply industry to stimulate competition are likely to be frustrated by uncertainties over gas supplies and prices.

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