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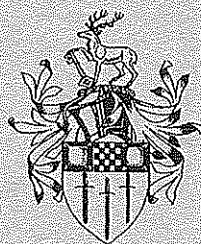
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Electricity Privatisation in England and Wales: Progress and Problems

Colin Robinson

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Enquiries:

Director of SEEC

and Editor of SEEDS: David Hawdon **Secretary:** Isobel Hildyard

E-mail: D.Hawdon@surrey.ac.uk

E-mail: I.Hildyard@surrey.ac.uk

SEEC, Economics Dept, University of Surrey, Guildford GU2 5XH, UK.

Telephone: +44-1483-259379

Fax: +44-1483-303775

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Professor of Economics, University of Surrey
Editorial Director, Institute of Economic Affairs

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ELECTRICITY PRIVATISATION IN ENGLAND AND WALES: PROGRESS AND PROBLEMS

Colin Robinson

SUMMARY AND CONCLUSIONS

It is only five years since the British electricity supply industry was privatised after many years of state ownership and, prior to that, state regulation so there has been relatively little time for the effects of privatisation to appear.

Even at this early stage, however, some lessons emerge from this attempt to privatise and liberalise a complex industry within which were previously embedded both naturally monopolistic and potentially competitive activities. The principal lesson is that most of the problems which have appeared are due to the government's failure, at the time of privatisation, to make a clearer separation between these two types of activities and to ensure that in the potentially competitive sectors the privatisation scheme encouraged a competitive process to begin. Regulation of the industry has been much criticised but it is not so much the regulatory regime *per se* which is at fault. The strains now showing in regulation are symptoms of a more serious underlying problem - that because of the way the industry was privatised, the government has heaped too many problems on the regulator.

Some advantages of the new regime

The new regime has some considerable advantages over the old.

First, government has disengaged and decisions are less politicised (though governments still try to interfere as old habits die hard).

Second, establishment of an independent regulatory office means that a more open system of regulation prevails than under the

old secretive regime when Ministers, officials and industry managers took decisions behind closed doors.

Third, and perhaps most important, entry to the industry has become possible instead of being prohibited by the state as it was under nationalisation. New generators and suppliers of electricity can move into the industry, knowing that they can transmit their electricity through a network not owned by generators and distribute it through networks which, though owned by distributors, should not discriminate against them.

Fourth, there have been considerable improvements in productive efficiency, especially in the generators, where labour and fuel costs have been greatly reduced compared with the days of nationalisation.

Fifth, as the competitive market has expanded, companies with a choice of supplier have begun to benefit from lower prices. Prices to residential consumers have fallen a little in the recent past (excluding the effect of imposing VAT): they should gain more from 1998 onwards when they can choose supplier.

Sixth, the old protective form of energy policy in Britain, conducted mainly by the support given to nationalised British coal and to nuclear power by the electricity supply industry, could not survive privatisation. Coal protection is now very small (regrettably, the net effect of the new regime may well be some bias against coal) and support for nuclear power is time-limited (to 1998). Electricity privatisation, despite its many flaws, was a significant step along the road to a liberalised energy market.

Deficiencies of the privatisation scheme

A number of deficiencies have, however, been revealed.

The most important single problem is the failure to establish a regime in generation which would transform a *potentially* competitive sector into one where a competitive process actually flourishes. The duopolistic structure (which has turned into a

tripoly as Nuclear Electric has expanded) has had both direct and indirect effects, the latter because of actions taken by the RECs to evade the market power of the incumbent generators. The initial structure of generation has interacted with the pooling system and with the contractual arrangements between entrants and RECs to channel competition away from those areas where it would have had most effect on the incumbents and most impact on prices. Moreover, the task of the regulator has been greatly complicated by the need to regulate generation: not only has regulating generation proved extremely difficult but OFFER's resources have been diverted away from supervising the naturally monopolistic sectors of the industry.

Second, the pooling system which has caused such problems is proving very hard to reform. Imposed markets, which participants are compelled to join, find difficulty in adapting to changing circumstances; they produce complex rules, which are for the benefit of existing participants and which act as a barrier to entering the industry. Adaptation tends to make the rules even more complicated. Proposals for pool reform have been aired for some time; it appears that agreement was almost reached in 1994 for an arrangement which would have allowed trading outside the pool but it was not acceptable to the regulator. It is not clear that any form of pooling, in addition to what market participants would agree among themselves, needs to be imposed. But to remove or reform an institution which was established by government and which has developed a life of its own is clearly difficult.

Third, outside generation potentially competitive activities and natural monopolies have been left in the same organisations, making regulation unnecessarily difficult. NGC, which controls transmission and central despatch and settlements, contains two pumped storage generating stations. More seriously, each REC owns its local network of wires to which it is supposed to provide non-discriminatory access. But it also engages in a variety of functions in which it competes with others - supply and, depending on the REC, appliance sales and services, contracting and generation - as well as having the ability to diversify into other activities.

Fourth, the initial supply and distribution price cap regimes (set by government) were unduly favourable to the RECs which have turned out to be much more profitable than had been expected. It was, of course, extremely difficult to predict the effects on profits. But there have been regulatory consequences as OFFER has had the difficult task of trying to adjust the original settlements.

A consequence of the weakness of competition in generation and the laxity of the initial REC price caps has been that shareholders and senior managers throughout the electricity supply industry have so far been the main beneficiaries of privatisation. Media attention has concentrated on the privatised utilities so that managers' salaries, and to a lesser extent, shareholders' gains have become a topic of public discussion. The public perception of electricity is of an industry where any recent favourable effects on prices have been dwarfed by large benefits to managers and shareholders. Demands that the regulator or the government 'does something' threaten a new politicisation and re-regulation of the industry.

Necessary reforms

Despite the deficiencies of the privatised electricity market, it is, in my view, an improvement on nationalisation mainly since entry to the industry is now possible, and has been shown to be feasible. Once all consumers have the power to choose supplier (from April 1998) the development of a genuinely rivalrous market may well be accelerated: not only will suppliers be subject to greater competition, they will put pressure on generators to bring down prices and on the regulator to reduce transmission and distribution charges.

Moreover, the privatised system is capable of reform in a way the old regime was not. If the following reforms were made, the privatised market would operate much more to the advantage of consumers.

Means of curbing the market power of National Power and PowerGen should be high on the agenda. Possibly, the regulator will succeed in his efforts (with or without MMC intervention) to make

the two companies divest themselves of 6 GW of plant so that new competition emerges. The nuclear review provides another important opportunity to introduce powerful competitors based on Nuclear Electric and Scottish Nuclear. So, to a lesser extent, does the flotation of NGC because the pumped storage business could become a separate company.

As well as NGC becoming only a 'wires business', the wires businesses of the RECs should be divested from the rest so that the electricity transportation network can be regulated separately as a 'natural monopoly'. With rivalry in generation and natural monopoly businesses divided from the rest, a competitive process should be stimulated. So far the British electricity supply industry has been too confined by its initial structure and too heavily regulated to produce the entrepreneurship and innovation which should appear in such a process.

The task of the regulator would be greatly eased if there were more rivalry in the industry. Regulation is such an unsatisfactory business that it should be avoided wherever possible. The fundamental problem is that where competition does not exist, regulation tends to be rather arbitrary since the regulator has virtually no knowledge to guide him/her; where there is competition, regulation is unnecessary. The reforms suggested above would confine regulation to sectors which at present appear naturally monopolistic (but where, in the course of time, ingenuity may find ways around monopoly positions).

One over-riding lesson from British experience of electricity for privatisation schemes generally is the importance of the initial structure. Once established, the institutional structure of the industry is difficult to alter; even in a short time vested interests emerge which oppose change because they stand to lose from it. Managers and shareholders, for example, will argue that the initial institutional order and initial regulatory settlements have special status and should not be disturbed. If the British government had been in less of a hurry to privatise and had spent more time devising a system capable of stimulating and sustaining a competitive process, even in 1995 the

gains from privatisation would probably be more clear cut than they now appear.

ELECTRICITY PRIVATISATION IN ENGLAND AND WALES: PROGRESS AND PROBLEMS

1 THE TRANSITION TO A PRIVATISED INDUSTRY

1.1 Advantages in principle

The privatised electricity market is very different from the previous nationalised regime. In addition to the structural changes at the time of privatisation, the three most significant differences are

- o entry is now permitted to both the generation and supply businesses whereas previously it was prohibited by the state;
- o the electricity companies now have private shareholders, instead of being owned by government;
- o regulation is by an independent body instead of being conducted behind closed doors, with unclear rules, by politicians, civil servants and industry managers.

In principle, these changes should have been beneficial. Actual and threatened entry should have brought increased rivalry in generation and supply, leading to increased efficiency pressures and lower costs which, in a competitive market, would have been passed on to consumers in the form of reduced prices and better standards of service. The threat of takeover should also have enhanced efficiency pressures and reduced the incentives which existed under nationalisation to concentrate resources on political lobbying: the industry's decisions about which fuels to use, which investments to make, whether to purchase British or overseas equipment and services and what prices to charge would no longer be subject to government influence. Regulation should have been confined to natural monopoly networks and based on clearly defined rules.

1.2 Problems in practice

In practice, many of these potential gains have yet to be achieved. That is not only because competitive habits take time to form after many years of state ownership and state regulation. The underlying problem is government failure to establish, at the time of privatisation, conditions in which a competitive process could flourish.¹

Particular difficulties have been caused by the decision to establish a duopoly in generation. Despite substantial entry by new generators, the market power of National Power and PowerGen has not as yet been significantly disturbed: as explained below, the pooling system and the contractual relationships which have developed (partly because of the duopoly) have allowed the two major generators to retain their influence over wholesale prices. Competition in supply to larger consumers has developed, but genuine competition in generation is still lacking: it is symptomatic of the absence of rivalry that the regulator has had to supervise generation much more closely than the government expected (4.2 below).

In the rest of this paper, the characteristics of the privatised market are analysed, with the emphasis on those which have inhibited competition, and regulation is discussed. Since one of the most fundamental issues is the duopoly and its consequences, that is the starting point.

2 COMPETITION IN GENERATION, FUEL USE AND THE POOL

2.1 The generation duopoly

Whatever the privatisation scheme, incumbent generators would have had some advantages over entrants. In addition to the usual 'advantage' of having plant with sunk costs (but see 2.2 below), they

¹ Colin Robinson, *Energy Policy: Errors, Illusions and Market Realities*, Occasional Paper No.90, Institute of Economic Affairs, 1993.

possessed sites linked into the transmission and distribution systems; more generally, as descendants of the nationalised industry they could take advantage of that industry's near-monopoly of information about all matters relating to electricity generation in Britain.²

But the duopoly structure of generation imposed by the privatisation scheme gave considerable additional power to the two major generators. Electricity demand is very insensitive to price changes in the short term yet, since the product is homogeneous, the demand for the product of any one generator is very sensitive to price. Thus the classic conditions exist in which a small number of producers can take advantage of the inelasticity of market demand by avoiding competition among themselves.

Establishing a duopoly, as the British government did, made it relatively easy for incumbent generators (and later Nuclear Electric - see 2.6 below) to avoid forms of competition which would have disturbed their market power. That is not to suggest they had explicit agreements. Tacit collusion - which is relatively straightforward in a duopoly, particularly when the two companies have been formed from one parent and probably have good knowledge of each other's costs - is a much more likely outcome of this kind of market.

2 Colin Robinson and Allen Sykes, 'Privatising Electricity Supply', Memorandum 48 in *The Structure, Regulation and Economic Consequences of Electricity Supply in the Private Sector*, Third Report of the House of Commons Energy Committee, Session 1987-88, HC307-II, London: HMSO, 1988, and Colin Robinson, Memorandum, in *Consequences of Electricity Privatisation*, Report of the House of Commons Energy Committee, Session 1991-92, HC 113-III, London: HMSO, 1992. The significance of information monopolies is discussed in George Yarrow, 'Does Ownership Matter?', in *Privatisation and Competition: A Market Prospectus*, Institute of Economic Affairs, 1989.

2.2 Fuel use, entry and the 'dash for gas'

One of the most significant changes consequent on privatisation was relaxation of political constraints on generator fuel choice. These constraints had been in operation for over thirty years and were one of the prime determinants of the initial fuel mix of the privatised industry.

Under nationalisation governments ensured that the industry burned British coal and constructed British-designed nuclear power stations. The CEBG's fuel mix at the time of privatisation therefore consisted largely of coal, with a substantial additional element of nuclear power. To maintain support for British coal and nuclear power, successive governments operated a *de facto* ban on the use of natural gas in power stations, starting in the mid-1960s when gas was found in the southern North Sea: it was subsequently reinforced by a similar move by the European Community. Because of these prohibitions, there was considerable pent-up demand for gas as a generation fuel by the time of electricity privatisation in Britain.

On privatisation, with government constraints on fuel use relaxed, the two major generators in England and Wales immediately began to diversify away from a fuel mix which they perceived to be costly relative to the alternatives and excessively polluting. About three-quarters of their plant capacity was coal-fired or dual-fired (coal and oil), with the rest mainly oil, as Table 1 shows. Their fuel mix was an incumbent disadvantage which offset some of their advantages. They no longer had any nuclear stations, though the output of those stations had to be taken by the RECs and had a share of about 17 per cent of pooled output in 1990 (Table 2).

For a time the generators' diversification moves were hampered by government insistence that they sign contracts with British Coal for the first three years of privatisation (up to March 1993) to take substantial amounts of coal - 70 million tonnes a year reducing to 65 million tonnes. The extra costs incurred by the generators in signing these contracts appear to have been passed on via the RECs to consumers in the franchise market. But the generators were still able to lay plans to build new CCGT stations,

to be commissioned post-1993, which appeared the cheapest form of baseload generation, which had short construction times (two to three years) compared with coal or nuclear stations and which also offered advantages in meeting EC sulphur emission targets. From 1993 onwards, the coal contracts were reduced - to 40 million tonnes in 1993/94 and 30 million tonnes a year for the next four years - and constraints on fuel choice were much diminished.

At the same time, entrants to the generation industry appeared, all choosing to build CCGT stations. The resulting 'dash for gas' was on a considerable scale. By early 1995, National Power and PowerGen had 6300 MW of CCGT stations either commissioned or under construction. As well as their wish to diversify away from coal, the two generators may have been making a pre-emptive strike at potential entrants by building, and announcing plans to build, CCGT stations. Whatever the reasons, by early 1995 entrants had commissioned or under construction a little more CCGT plant than National Power and PowerGen - about 6900 MW (over 10 per cent of pooled generation capacity in England and Wales).³ One consequence of the 'dash for gas' was to accelerate the decline of the British coal industry.

As a result of new entry (and also an increase in Nuclear Electric's market share), there has been a substantial decline in the shares of National Power and PowerGen of pooled output. In 1990-91, as Table 2 shows, National Power's market share was over 45 per cent and PowerGen's share was 28 per cent: but in the year ending September 1994 those shares were down to 34 per cent and 25 per cent respectively. Nuclear Electric, which has been successful in increasing the output of its AGRs, increased its share from 17 to 23 per cent over the same period. New entrants accounted for about 7½ per cent of pooled output in the twelve months ending September 1994 and that share will increase to about 10 per cent as capacity under construction is commissioned.

3 S.C. Littlechild, 'Competition in Electricity: Retrospect and Prospect', in *Successes and Failures of Utility Regulation*, Institute of Economic Affairs, IEA Readings No.42, 1995.

2.3 The pool and its effects

Given this volume of entry in a relatively short period, it might seem that the market power of the major generators would inevitably be curbed. But, despite the reduction in their market share, the impact on their ability to set prices has been minimal: as explained below, the electricity pooling system in England and Wales, established by the privatisation scheme, has concentrated their influence on a crucial segment of the market.

The electricity pool is a central despatch and settlement system in which the National Grid Company (NGC), the privatised transmission company, has a central role in matching supply and demand. Under nationalisation, the CEBG operated a 'merit order' in which it despatched plant in ascending order of operating cost. Under the new regime, pool membership is a requirement of generation and supply licences so all substantial generators are compelled to use the pool. Electricity supplied to Britain via a 2 GW link with France is also sold into the pool. Generators submit price bids for each generating unit for each half hour of the following day. NGC then orders the bids and despatches plant in merit order to meet its estimate of demand. A difference from the nationalised regime is that the merit order is based on price bids rather than estimated operating costs.

Each generator receives a price which is the sum of two elements. The first is the System Marginal Price (SMP) which is the price bid by the marginal generating unit in the relevant half hour. The second is a capacity payment for all capacity declared available (whether or not it runs) which is the product of the 'loss of load probability' (LOLP) and the 'value of lost load' (VOLL).

VOLL is intended to place a value on the cost to consumers of a power shortage. It was set initially at £2 per kWh, indexed to the rate of inflation: in an apparent hangover from the days of nationalisation a central judgement is made about how lost load is valued rather than consumers being allowed to decide for themselves. The effect of the capacity payment term in the pool price formula is that as demand moves closer to declared capacity, so the

LOLP increases and payments to generators increase. Thus incipient shortages translate into a price signal to make more existing capacity available and to invest to increase capacity, albeit the signal is based on an apparently arbitrary estimate of VOLL.

Purchases of electricity are not at pool input price (PIP) but at the pool output price (POP) which is higher at certain times of day to the extent that it includes 'uplift' payments - for example, to cover the cost of transmission constraints, maintenance of reserves and other system costs.

This pooling system has combined with other characteristics of the privatised electricity market to accentuate the market power of National Power and PowerGen. If entry to the generation industry consisted of a diversified mix of plants in terms of load factor - some operating on baseload, some mid-merit plant and some peaking plant - SMP would be set in rivalrous conditions. However, in practice National Power and PowerGen have set SMP almost all the time because of the lack of competition outside the baseload power market.

2.4 Entrant/REC relationships

The reasons why there is minimal competition outside the baseload market are traceable back to establishment of the duopoly, to avoiding action taken by the RECs and to the characteristics of contracting under the privatised regime.

As already explained, all entry to generation has so far been by companies with CCGT plants. Most entrants are associated with one or more RECs which either have an equity stake in the company or a long-term (usually 15-year) contract with it for the supply of power. RECs have regional monopoly power - they are incumbents with a monopoly over smaller consumers until 1998 and, as successors to the old Area Boards, a near-information monopoly about local conditions - and so possess considerable freedom of manoeuvre in contracting.

RECs have used this freedom to form close equity or contractual relationships with entrants to generation because they have wished to diversify sources of electricity supplied to them, avoiding dependence on a duopoly in generation. RECs are limited in the amount they can generate themselves to 15 per cent of supplies but they are not restricted in their ability to contract with entrants to generation provided they meet an obligation to purchase economically. Thus the presence of a generation duopoly has more significance than the direct constraints it places on competition in generation. It has led also to the REC/entrant relationships just described: had the CEGB been split into more generators, the RECs would have had less incentive to diversify in this way.

These contractual relationships have in turn influenced the development of competition as between baseload and non-baseload. The long-term contracts which the entrants have with RECs are mirrored by the long-term contracts entrants have signed to take gas from fields in the North Sea. These contracts are 'take-or-pay', as most North Sea gas contracts have been since 1968 when British offshore gas first began to flow: take-or-pay contracts with high minimum bills are a characteristic development in a monopolised and monopsonised gas market such as existed at that time as a matter of government policy.

Because they have take-or-pay, minimum bill contracts, entrant generators find a large element of their gas purchase costs is fixed. Thus the marginal cost of gas to them is zero and they have a powerful incentive to maximise the volume of their gas sales by bidding into the pool at whatever price will secure baseload operation. Thus despite the large volume of entry, all the entrants' plant runs on baseload. None competes with mid-merit and peaking plant. Nuclear stations also run on baseload. All non-baseload plant (left over from the days of nationalisation) apart from pumped storage is still owned by National Power and PowerGen. Consequently, SMP is set about 85 per cent of the time by those two companies (in most of the other 15 per cent, NGC's pumped storage stations set SMP). Two recently announced CCGT projects (with a capacity of about 1000 MW in total) seem to be on a different basis: it appears that in neither case is there a long-term power purchase

contract with a REC but it is not clear whether they mark the beginning of a new trend.⁴

2.5 Unintended consequences and the development of competition

Summarising, the British government's privatisation scheme for electricity generation resulted in a stream of unintended consequences.

First, in order to placate the management of the CEGB and to make nuclear privatisation easier (though in the event that privatisation did not take place), the government established a duopoly in generation. Second, because of past government action there was a huge pent-up demand for gas which meant that any new entrants would build gas-fired plant, buying their gas in a market where (again because of past government actions) take-or-pay contracts were the norm. Third, the RECs - concerned at the market power of the duopolists - decided to circumvent it and so teamed up with new entrants on long-term contract. Fourth, all the new plant is on baseload and so competes with existing generators only in that part of the market. Thus the incumbents retain market power in that crucial segment of the market where, because of the characteristics of the pooling system, prices are set. The market features mentioned above have controlled competition, channelling it into areas where it would least affect incumbents and have least impact on wholesale prices. Some of the effects on prices to consumers are discussed in 3 below.

The (unintended) consequences for competition in generation are serious. A calculation by the Office of Electricity Regulation⁵ shows that in 1993-94, National Power and PowerGen had 95 per cent of non-baseload output (compared with 55 per cent of baseload output). So entry to the industry has depressed the major generators' share only of baseload output. Of course, as National

4 Littlechild, *op. cit.*

5 *ibid.*

Power and PowerGen stations are displaced from baseload they compete with mid-merit and peak plant: but virtually all the plant concerned is owned by the two big generators so, as OFFER concluded, 'The two companies are thus competing only with each other for a critical part of the load curve'.

Another feature of generation which the Director General of Electricity Supply (DGES) has pointed out,⁶ is that the major generators' shares of capacity have declined less than their shares of output. On vesting day, their combined share of output was the same as their share of capacity - 78 per cent. But, though their share of output has declined to 59 per cent their share of capacity has fallen much less - to 69 per cent. The presence of this substantial amount of spare capacity waiting in the wings - which can be brought into the market if the two generators choose and will then affect capacity payments - is likely to be a deterrent to entry.

2.6 The contracts market

Although most generated electricity is pooled, there are considerable risks to market participants in relying on a spot market such as the pool, particularly in view of the distortions discussed above. Variations may occur not only for the reasons one would expect in any electricity market - according to time of day and season of year and because of unexpected weather or other unpredicted events. In the pool, there is the possibility of strategic gaming by the duopolists.

Experience has now revealed how large variations in the pool can be and how they tend to be magnified by the LOLP/VOLL mechanism (see 2.3 above). In January 1995, for instance, there were some particularly large fluctuations in pool prices, caused apparently by the temporary closure of two nuclear power stations which affected prices primarily by increasing LOLP. On one day in late January, PIP reached a maximum of over 63 pence per kWh between 17.30 and 18.00 hours with a corresponding POP of over 72 pence, as compared with minima in the early hours of the same

66 *ibid.*

day of only 0.9 pence. On another day in April 1995, there was a short period during which the input price rose above 83 pence per kWh (though there were evidently software problems at the time).⁷

To protect against pool price fluctuations, a contracts market has developed in England and Wales through which most electricity is traded. 'Contracts for differences' (CFDs) - in which the differences are from a strike price - between generators and electricity suppliers settle in advance the price at which most electricity is bought and sold, thereby protecting against the uncertainty of pool prices.

The presence of CFDs tends to make generators less concerned about pool prices than they would otherwise be, but they are not always fully contracted and so may be affected at the margin by pool price fluctuations. RECs and large consumers also protect themselves by CFDs but again some may be affected at the margin and some large consumers (such as ICI and other chemical companies) purchase at pool prices. It is also, of course, true that over a period of years there must be a relationship between pool and contract prices since consumers have the option of buying at one or the other price.

Lack of competition in the contracts market (as well as in the pool) has concerned the industry regulator. There are three big players in the contracts market - National Power, PowerGen and Nuclear Electric - all of which have an incentive to keep up prices rather than compete vigorously. Tacit collusion in a triopoly is therefore an issue. OFFER's evidence to the government's 1994-95 nuclear review is forthright about the ineffectiveness of Nuclear Electric as a competitor to the two big privatised generators.⁸ It points out that it has contracted a significantly lower proportion of its output than the other two generators: according to OFFER, its 'limited contribution' to the contracts market may have been a

7 'Power price reaches record levels', *The Financial Times*, 12 April 1995.

8 Office of Electricity Regulation, *Submission to the Nuclear Review*, October 1994.

'significant factor in restricting the availability of contracts and maintaining higher prices than would otherwise obtain'.

2.7 Efficiency gains in generation: reducing inputs and input prices

Despite the weakness of competition in generation, one effect of privatisation has been to stimulate considerable reductions in costs by National Power and PowerGen. Now they have shareholders and political constraints on fuel choice are much reduced, the two generators have moved to cheaper and much less labour-intensive gas-fired generation. They have also negotiated lower prices for the coal they are still burning now they are no longer forced by political pressures to contract for such large quantities of British-mined coal.

The most striking expression of these cost reductions is in manning economies (revealing the degree of disguised unemployment which existed during the years of nationalisation). National Power and PowerGen reduced their workforces by nearly two-thirds in the first four years of privatisation (Table 3) and are continuing with reductions though at a slower rate. Labour force reductions in the RECs were smaller - about 13 per cent on average over the same four years.

The prices of generation fuels have also fallen compared with what they were when they were heavily influenced by government actions to protect British coal and nuclear power. In 1994, the major generators paid about 23 per cent less for their coal than they did, on average, in 1988. The price of natural gas, which has only been used on any scale in power generation since early 1993, fell 13 per cent between then and fourth-quarter 1994.

Predictably, given that serious rivalry has yet to develop in generation, most of these efficiency gains seem not to have been passed on to consumers. Consumer price trends are analysed in 3 below.

3 CONSUMER PRICE TRENDS

Until recently the results of electricity privatisation in terms of prices were disappointing, even in the sectors of the market where consumers had choice and despite the considerable cost reductions mentioned in 2.7 above. A study carried out in 1992 suggested that prices in the early privatisation period were considerably higher than might have been expected on the basis of pre-privatisation trends.⁹ Since 1993, however, prices to most consumers have tended to stabilise or fall.

To place movements in electricity prices in the context of changes in fuel prices in general, Figure 1 illustrates quarterly trends in coal, fuel oil, gas and electricity prices to industry (all expressed in thermal equivalent terms) since first quarter 1988. That period is taken as the starting point because the White Papers on electricity privatisation were published in February and March 1988: from then onwards, electricity prices began to adjust to the prospect of privatisation.

In essence, the Figure shows that average coal prices to industry have fallen somewhat, that gas prices have fluctuated around an approximately constant trend and that fuel oil prices have tended to increase (abstracting from the sharp rise at the time of the Iraqi invasion of Kuwait in 1990). Despite the declining costs of labour and fuel inputs, electricity prices have risen significantly. Comparing fourth quarter 1988 with fourth quarter 1994 (to minimise seasonal effects), the increase is about 18 per cent, equivalent to an annual average compound rate of nearly 3 per cent.

Some specific factors in the electricity market help explain these increases relative to gas and coal prices. One is the considerable electricity price increases just before privatisation which were generally interpreted as government-inspired efforts to 'fatten up' the industry. Another is the loss of a scheme under which about 4 million tonnes of coal a year was provided to the CEGB by British Coal at around world prices: the benefits of the electricity deemed

9 George Yarrow, *British Electricity Prices Since Privatisation*, 1992.

to be produced from this coal were passed on to about 400 large consumers under the so-called QUICS (Qualifying Industrial Consumers' Scheme). Another factor is the gradual introduction of competition because of which only consumers of 1MW or over had a choice of supplier between vesting day in April 1990 and March 1994. As Figure 1 shows, industrial electricity prices in 1994 (when the competitive market had expanded) were rather lower than in 1993.

The companies which have suffered most from electricity price increases are very large consumers which lost their subsidies; according to DTI statistics,¹⁰ (on which Figure 2 is based) 'extra large' consumers were paying 27 per cent more for their electricity in fourth quarter 1994 than in fourth quarter 1989 (1989 is as far back as the statistics go). Companies too small (less than 1MW demand) to have a choice of supplier before April 1994 also fared badly before they entered the competitive market: in first quarter 1994 they were, on average, paying 25 per cent more for their electricity than in first quarter 1989. By the fourth quarter of 1994, however, the effects of competition were apparent: the average price they were paying was only about 4 per cent higher than in fourth quarter 1989.

Moderately large and medium size consumers - which have been in the competitive market from the beginning and had no subsidies to lose - have, as one would expect, fared better. They had fairly small price increases of about 7½ per cent each from third quarter 1989 to third quarter 1994. Prices paid by both groups have been tending to decline recently: in fourth quarter 1994 the prices they paid were about the same as in fourth quarter 1989.

Outside the competitive market, residential consumers - who are the captives of their local RECs until 1998 - have faced big increases in electricity prices since privatisation. Increases in domestic electricity prices have outstripped increases in other domestic fuel prices since the late 1980s. Domestic electricity prices in fourth quarter 1994 were about 48 per cent higher than in the first

10 Department of Trade and Industry, *Energy Trends*, HMSO (monthly).

quarter of 1988 whereas the price of gas (electricity's main competitor in homes) was only 29 per cent higher. Most of the increase in domestic electricity prices took place between 1988 and 1992 since when, eliminating the effect of the imposition of VAT in 1994, prices have fallen slightly.

In general, benefits to consumers (in terms of prices) seem small when set against the efficiency gains since privatisation. The trend does, however, appear to be changing and it may well be that prices to most consumers will fall over the next few years because of increasing supply competition and tighter regulation of distribution charges.¹¹

4 REGULATION

4.1 The difficulties of regulation in electricity

From the earlier part of this paper it will be obvious how large a burden falls on the Office of Electricity Regulation. In a paper written when the 1988 White Papers on electricity privatisation were published I suggested that the scheme would make the regulator's task '...extremely difficult if not downright impossible' and that 'The root of the regulatory problem...will be the failure to establish an initial structure of generation which is clearly likely to stimulate competition'. With a competitive generation sector, regulation would have been able to '...concentrate on making sure that the way in which the transmission and distribution sectors operated allowed gains to be passed on to consumers in terms of lower prices without loss of service'.¹²

Regulation has certainly proved extremely difficult. OFFER has been confronted with a complicated privatisation scheme imposed on a complex industry in which many of the 'new' organisations are

11 Reports indicate that many industrial and commercial consumers have secured price cuts averaging 4 or 5 per cent for the year beginning April 1995. See 'Big energy users win price cuts', *The Financial Times*, 31 March 1995.

12 Colin Robinson, 'Liberalising the Energy Industries', *Proceedings of the Manchester Statistical Society*, March 1988.

based on old ones and old relationships still persist. Moreover, the scheme failed to distinguish clearly between those activities which are naturally monopolistic with present technology and those which are potentially competitive.

For example, embedded within the long-distance 'wires business' of NGC are two pumped storage generating plants, Dinorwic and Ffestiniog, with a combined capacity of 2000 MW which are virtually the only plants not owned by National Power and PowerGen which have any influence on SMP (see 2.4 above). Had they been placed in a separate company, competition in generation would have been enhanced and regulation of NGC would have been more straightforward since there would have been no confusion of natural monopoly and competitive activities.

Such confusion has, however, been much greater in the case of shorter distance movement of electricity (distribution) which was left in the hands of the RECs even though they had to account for it as a separate business. This has brought serious regulatory difficulties because of the number of functions which RECs have other than electricity transportation: they are suppliers of electricity (with monopolies of the small consumer market until 1998), suppliers of electrical appliances (in most cases), electrical contractors (in most cases), generators (in most cases) and they had, after privatisation, the ability to diversify into other areas. Thus, regulating the RECs is a much more complex task than supervising a network monopoly.

In such circumstances, the scope of regulation has been extremely wide,¹³ in effect covering the whole industry instead of those parts which might be regarded as naturally monopolistic. OFFER has been constantly drawn into regulating generation, an activity which could have been highly competitive and which the government evidently expected would require only minimal attention from the regulator: in other sectors its task has been complicated by

13 Colin Robinson, 'Privatising the Energy Industries: The Lessons to be Learned', *Metroeconomica*, Vol.XLIII, Nos.1-2, February-June 1992., and 'L'apprentissage de la concurrence', *Le Communicateur*, Paris, Winter 1995.

the mixture of naturally monopolistic and potentially competitive functions it has had to supervise. Consequently, its resources have been diverted away from the task (difficult enough in itself) of regulating the 'natural monopoly' network of wires.

Not only is the scope of regulation wide, OFFER's powers are wide also because, as in all British privatised utilities, the Director General has a duty to promote competition (as well as issuing and modifying licences, making sure licence holders can finance their activities and similar regulatory functions). In the case of electricity the pro-competition duty is very explicit. The Electricity Act 1989 sets out one of the prime duties of the regulator (shared with the Secretary of State for Energy) as '...to promote competition in the generation and supply of electricity'.

4.2 Regulating generation

In generation, the sector where some competition was introduced from the beginning, the complexities of the privatised system have combined to minimise the impact of competitive forces on the incumbents (2 above) so consumer interests have not been safeguarded: the trigger for OFFER investigations has usually been complaints from large users of electricity.

Five reports have been issued by the regulator on pool prices and related issues.¹⁴ None so far has resulted in a reference to the MMC which is one of the sanctions the regulator has, though such references have been threatened. Following the last investigation in February 1994, OFFER placed a temporary two-year cap (until March 1996) on average pool purchase prices at 2.4 pence per kWh time-weighted and 2.55 pence per kWh demand-weighted (both in October 1993 prices), implying a reduction of about 7 per cent compared with the first nine months of 1993-94. It also insisted that

14 Office of Electricity Regulation: *Report on Pool Price Inquiry*, December 1991; *Report on Gas Turbine Plant*, June 1992; *Report on Constrained-on Plant*, October 1992; *Pool Price Statement*, July 1993, Birmingham; and *Decision on a Monopolies and Mergers Commission Reference*, February 1994.

National Power and PowerGen 'use all reasonable endeavours' to sell or dispose of 6 GW of coal-fired or oil-fired stations in order to bring into the market other generators with mid-merit or peaking plant. OFFER's report expressed concern that '...the two generators have used their market power to achieve their aims of higher prices'.

Early in 1995, no plant sales had been made and a surge in pool prices (2.6 above) again brought complaints from large industrial users of electricity.¹⁵ The DGES then reminded the generators of their undertakings and said he was monitoring their actions: his statement was taken to be an implied threat of an MMC reference.¹⁶

Other proposals for stimulating competition in generation centre on structural changes. One opportunity for such changes is the review of the nuclear industry which the government is now conducting which could result in privatisation.¹⁷ Nuclear power could be privatised in such a way that two powerful new competitors, based on Nuclear Electric and Scottish Nuclear would be introduced into the market along with a smaller company with Magnox stations. It is likely that the ageing Magnox stations cannot be privatised: their operation could, however, be contracted out so that they became another competitor in the electricity market.

The competitive potential of Nuclear Electric and Scottish Nuclear is at present limited because they are state-owned, because of their inability to diversify out of nuclear power and because of geographical market-sharing arrangements. Nuclear Electric provides only baseload power in England and Wales and has not competed

15 In the year to March 1995, the demand-weighted pool price was slightly in excess of the agreed cap. See 'Power groups face crackdown', *The Financial Times*, 1-2 April 1995.

16 'Setback for Treasury on sale of generators', *The Financial Times*, 28 January 1995; and ICI threat of call for electricity price probe, *The Financial Times*, 25 February 1995.

17 OFFER, *Submission to the Nuclear Review, op. cit.*. Colin Robinson, *Privatising Nuclear Power*, evidence for the review of future prospects for nuclear power, September 1994.

vigorously in the contracts market (2.6 above). Scottish Nuclear is confined to Scotland and so does not compete in either the pool or the contracts market in England and Wales. However, if Nuclear Electric and Scottish Nuclear were privatised and at the same time the two companies were made more equal in size (by a plant reallocation) and geographical constraints were removed, they could become formidable competitors for National Power and PowerGen in the pool and the contracts markets. In the course of time, the two companies would be likely to diversify and begin to compete outside the baseload market.

4.3 Regulating the regional companies

As explained, distribution within each REC remains a local monopoly. Not surprisingly, it is more profitable than supply where competition has developed for the large consumer (100 kW and above) market. Supply to smaller consumers was initially regulated under an RPI-X + Y formula which allowed a REC to pass through (as Y) the costs of electricity purchases, transmission and distribution charges, though subject to a price cap equal to the change in the RPI. Each REC retains until 1998 its monopoly of consumers with a maximum demand of less than 100 kW - that is, virtually all residential consumers and some others. Supply should become very competitive from 1998 onwards, when all consumers have a choice of supplier, though experience when the monopoly threshold was reduced from 1MW to 100 kW in 1994 suggests that competition will for a time be hampered by metering problems.

The supply price cap for consumers with a demand of less than 100 kW was tightened from RPI-0 to RPI-2 from April 1994.¹⁸ Distribution charges are of more significance to consumers since, on average, they account for about one-third of residential customers' bills. A distribution price review by OFFER took place in mid-1994, following which the regulator proposed (and the RECs accepted) one-off cuts in distribution charges, varying by REC between 11 per cent and 17 per cent, to take effect from April 1995. Subsequently, all such charges would be subject to an X term of -2:

18 OFFER, *Annual Report 1993*, p.5.

previously X had been zero or positive (up to 2½ per cent).¹⁹ Although the review was accepted by all the RECs without challenge, one of the Scottish companies (Hydro Electric) appealed to the MMC which is carrying out an inquiry and is due to report in May 1995.

The distribution settlement was, however, upset in March 1995 when the regulator announced that, though the new distribution charges would stand for the year beginning April 1995, he would reconsider the proposed charges for subsequent years. The trigger for his change of view was evidently a bid by Trafalgar House for one of the RECs, Northern Electric.

According to the regulator, he had already become concerned - because of rising REC share prices and representations made to him by consumers - that his 1994 review might have been too lax.²⁰ But what convinced him to reconsider was a defence document produced by Northern Electric in response to the Trafalgar bid which promised big cuts in costs, special payments to shareholders, increased gearing and substantial dividend increases. In other words, the regulator concluded that the bid revealed new information about the costs of one REC and, by implication, all RECs. It seemed that, if pressed, they could reduce costs much more and provide considerably greater benefits to shareholders than had been apparent at the time of the 1994 distribution review. Moreover, they could significantly increase gearing.

Claimed benefits of a price cap regime, with reviews every five years or so, are its stability and the incentive it gives to regulated companies to reduce costs (because, unlike a rate of return system, they can appropriate the cost reductions in terms of increased profits). Despite upsetting that stability and creating uncertainty (which incidentally affected the sale of the government's 40 per cent shares in National Power and PowerGen), the regulator

19 'Cuts promised in electricity prices', *The Financial Times*, 11 August 1994.

20 Stephen Littlechild, 'Better to grasp the nettle now', *The Financial Times*, 9 March 1995, and OFFER Press Notice, 24 March 1995.

decided that the distribution charges he had just set must be re-visited. Proposals to tighten the price controls are due to appear by end June 1995.

Whatever one thinks about the events of March 1995, their most interesting aspect is that it took a hostile takeover bid to reveal relevant cost information about Northern Electric. No matter how assiduous and determined is a regulator, in the absence of a market it is genuinely impossible by regulatory calculation to estimate what a company's costs 'should' be.

The bid failed, temporarily anyway. After the regulator's intervention, Northern's share price dropped far below the level of the bid and, under British takeover rules, another bid is not normally permitted within twelve months (though the Northern Board is reported to have indicated it will agree to a new offer once the present regulatory uncertainty ends). But, in another sense, the bid worked extremely well: it discovered information which would otherwise have remained hidden. An incumbent management, under pressure from an alternative management team, found scope for substantial efficiency gains and revealed them to the financial markets.

4.4 Future regulatory concerns

As well as the unresolved problems of curbing the power of the two major generators explained in 4.2 above, there are some difficult issues in regulating the RECs. Such difficulties may be eased by further takeover bids which help to establish efficiency standards for RECs, provided the appetite for takeovers is not too much diminished by the Northern case. Whether or not there are more takeover bids, there is now considerable popular concern, which may be translated into regulatory action, about the profitability of the RECs and the big increases in salaries of their senior executives. Media attention has indeed focussed on executive salaries in all the privatised utilities. One reason for the spectacular rises is that salaries were held down under nationalisation. But there is legitimate concern that in an industry where competition is relatively weak,

shareholders and managers are reaping most of the benefits of privatisation at the expense of consumers.

Another issue being debated is the price cap (RPI-X) system which is one of the features of British utility regulation. The electricity regulator's actions in re-opening the distribution price review were a blow to price-cap regulation. But there are also issues of principle. As already explained, a price cap is intended to bring stability and efficiency incentives as compared with a rate of return system. Setting X, however, presents serious problems and tends to be arbitrary in circumstances where no markets exist. British utility regulators, searching for quantitative measures which would help determine X, tend to turn to profits as a measure of company performance. But the more they do so, the more British price cap regulation tends to revert to rate of return regulation, reducing incentives to introduce cost savings which would raise profits (because increased profits may lead to increases in X).

One way of easing the burden of regulation would be to establish a clearer separation between naturally monopolistic and potentially competitive activities. In the case of the RECs, there would be advantages to the regulator if distribution were divested and therefore clearly separated from other functions (in the same way that transmission was separated from generation at the time of privatisation).

TABLE 1 NATIONAL POWER AND POWERGEN POWER STATIONS AT VESTING DAY

by type of fuel

	National Power		PowerGen	
	GWso	% of total	GWso	% of total
Coal	19.5	66	11.6	62
Coal/Oil	2.6	9	1.9	10
Oil	5.9	20	4.0	21
Gas Turbine	1.6	5	1.2	6
Hydro	0.1	-	0.1	1
Total	29.7	100	18.8	100

Source: CEGB Statistical Yearbook, 1988-89, Table 11B

TABLE 2 GENERATOR MARKET SHARES OF POOLED OUTPUT

per cent

	1990/91	1993/94	Oct 1993- Sept 1994
National Power	45.5	35.0	34.2
PowerGen	28.4	26.1	25.3
Nuclear Electric	17.4	23.2	23.3
Inter-connectors and Pumped Storage*	7.7	8.4	8.8
New entrants	0.0	6.2	7.3
Others**	1.0	1.1	1.1
Total	100.0	100.0	100.0

* ScottishPower and Hydro-Electric (via the Scottish Inter-connector), EdF (via the French Inter-connector) and NGC Pumped Storage

** Mainly BNFL, AEA and renewables

Source: S.C. Littlechild, 'Competition in Electricity: Retrospect and Prospect', in Regulating Utilities, Institute of Economic Affairs, 1995 (forthcoming)

TABLE 3 EMPLOYMENT IN ELECTRICITY GENERATION

	Vesting Day 1990	end March 1994
National Power	17,200	6,000
PowerGen	9,500	4,400
	26,700	10,400

Source: National Power Annual Review 1993
PowerGen Report and Accounts 1993 and
Press reports

Figure 1
Prices of Fuels Purchased
GB Manufacturing

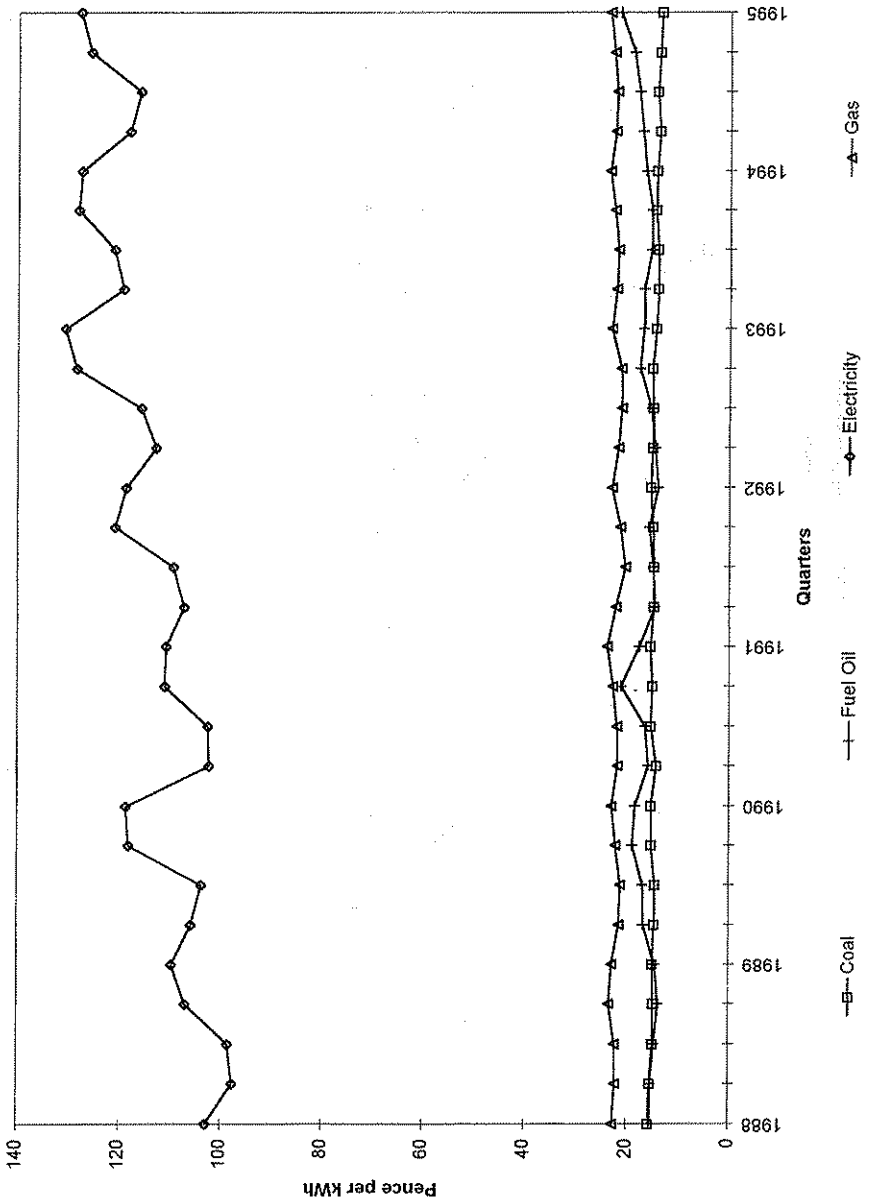
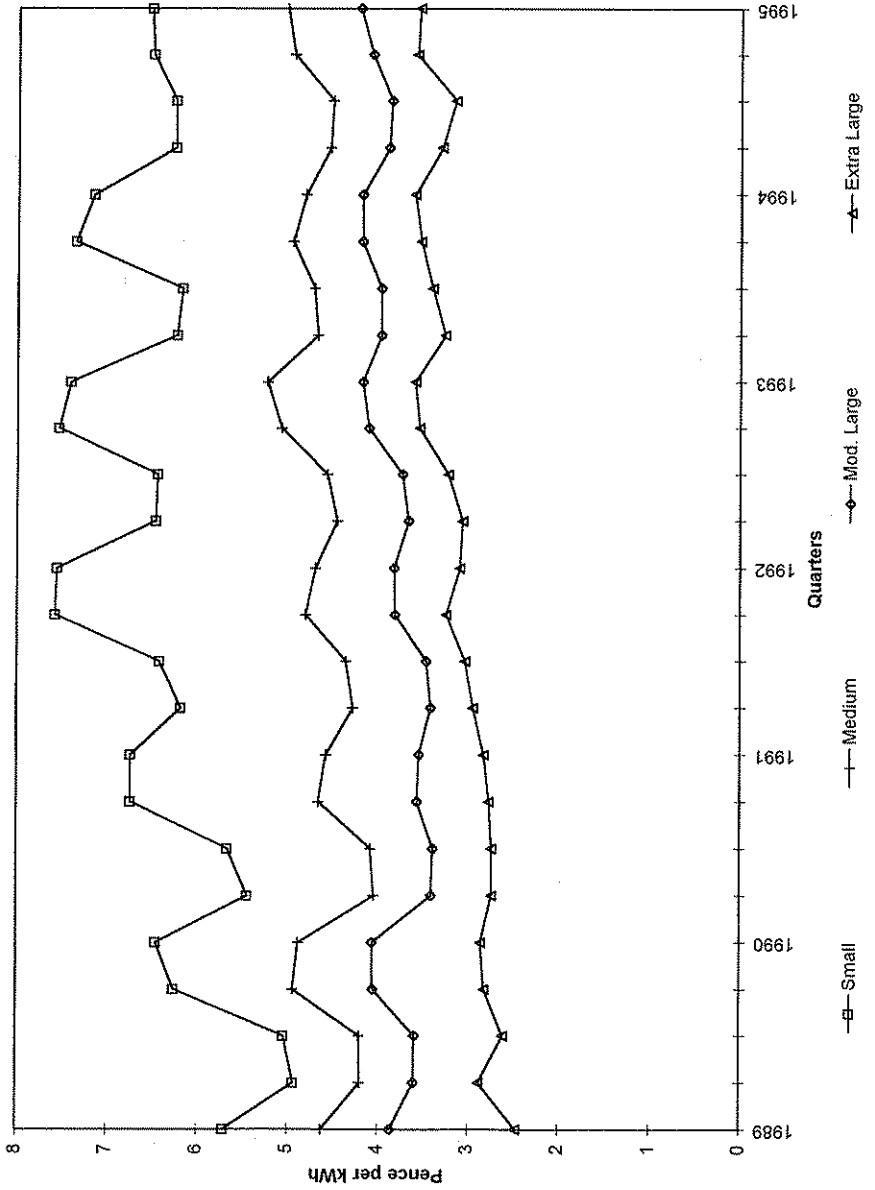
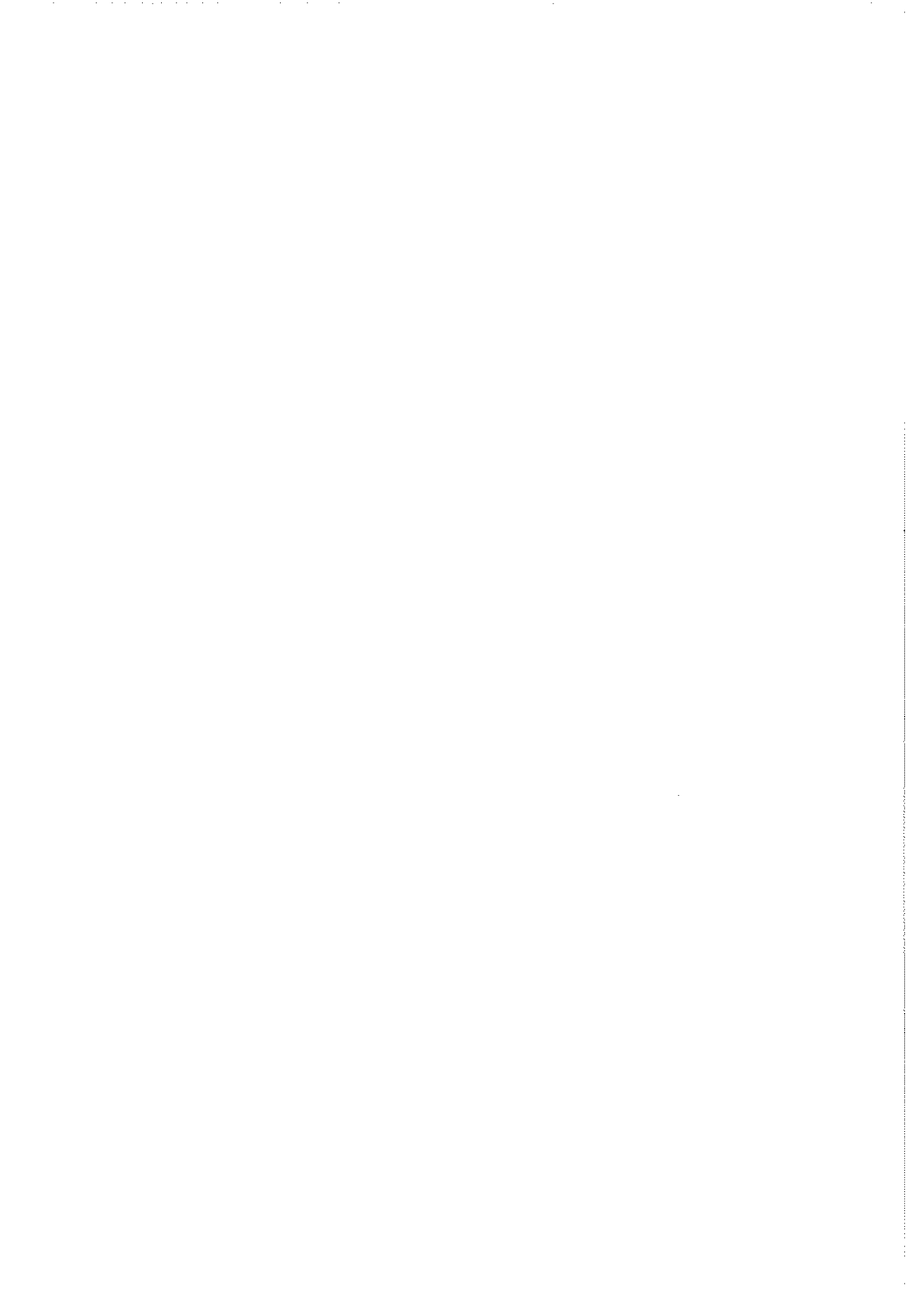


Figure 2
Prices of Electricity Purchased
GB Manufacturing





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