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CIRIEC
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24th International Congress of CIRIEC

Napoli Italia 30 settembre - 2 ottobre 2002

REGULATION IN A DEREGULATED ENERGY MARKET: BRITISH EXPERIENCE

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Plenary session, September 30

1 - INTRODUCTION

Since the British electricity industry was privatised and restructured in 1990, it has been held up as the example other countries should follow. Consultants, encouraged by the World Bank, have recommended the adoption of the 'British Model' in countries with as diverse needs as India, Ukraine and Brazil, while the British Model was clearly the inspiration for the European Commission's 1996 Electricity Directive.

On the face of it, the case for emulating Britain's policy seems strong. Since privatisation, prices have fallen in real terms by about 25 per cent, system reliability has been maintained at high levels, and environmental emissions targets have been comfortably met. However, all is not as it seems and the system that is emerging in Britain is some way from the ideals of the British Model. The basic principles of the British Model were: the introduction of a half-hourly wholesale market that would be the primary price-setting arena for wholesale electricity purchases; introduction of retail competition; unbundling (or de-integration) of the industry into four separate activities; and regulation of the industry, especially setting the prices for monopoly services by an autonomous Regulator. If we examine the current position in Britain in more detail we see a very different system. The wholesale market is now expected to be dominated by confidential long-term contracts; retail competition has disadvantaged small consumers and makes protecting the poorest consumers more difficult; integrated generation and retail supply companies now dominate the market; and price regulation has evolved into a form of traditional rate-of-return regulation.

This presentation focuses on the role of regulation in the British electricity sector, particularly in setting monopoly prices, regulating industry structure and protecting small, and especially poor consumers. It tries to explain why the British Model has not been implemented in Britain: was it a failure on behalf of the British authorities to implement the model or was it based on a realisation that the British Model, in its pure form, was not viable?

2 - THE CURRENT SITUATION

Prior to looking in detail at these issues, it is useful to examine in detail the current situation in Britain to pinpoint exactly how performance has been improved. Many of the apparent advances seem to have taken place since 1995. In particular:

- One of the weaknesses of the initial structure, that the generation sector was dominated by a 'duopoly', National Power and Powergen (80 per cent of generation at privatisation), has been overcome and generation is now split between more than ten companies, with no company having more than 15 per cent of the market (see Table 1);

- A new, more sophisticated wholesale market has been introduced to replace the Pool and in the period since the announcement of the replacement of the Pool, wholesale electricity prices appear to have fallen by about 50 per cent;

- Retail competition has been extended so that all consumers could choose their retail supplier from 1999 onwards;

- The performance of the nuclear sector improved sufficiently for the nuclear subsidy, 10 per cent of all bills, to be removed in 1996;

- The network has now been fully separated from commercial activities. The transmission network is now owned and operated by an independent company (since 1995) and the regional companies have been required to make a full separation between their distribution and retail activities (since 2000). Non-discriminatory access to the network is therefore guaranteed and there is no scope now to subsidise commercial activities from monopoly activities; and

- There have been large reductions in the price of monopoly services since 1995. Distribution prices have halved and transmission prices have fallen by 40 per cent.

Most of these advances will be discussed in the main section of the paper, but the wholesale electricity market, the nuclear subsidy and environmental performance can be dealt with briefly.

Table 1 British Electricity Industry Structure: 1990 and 2002

Generation (Capacity GW)

1990		**2002**	
National Power	30	British Energy (heavy losses)	11.6
Powergen	20	*Innogy (RWE)	8.0
Nuclear Electric	8	*Powergen (E.ON)	7.4
		*Scottish Power (merger with S&S?)	5.0
		*EDF	5.0
		AES (kept solvent by junk bonds)	4.8
		AEP (2GW for sale)	4.0
		*Scottish & Southern	3.8
		*TXU (1.2GW mothballed)	3.0
		BNFL (huge losses)	2.7
		Edison Mission	2.4
		*British Gas	1.5
		International Power (.5GW mothballed)	1.5

2.1. NETA

The New Electricity Trading Arrangements (NETA) are immensely complex and apparently very sophisticated, but they are less ambitious than the Pool they replaced. Unlike the Pool, which was expected to be the dominant arena for trading electricity, spot market deals under NETA were not expected to account for more than a few percent of electricity sales. Most sales were expected to be under confidential long-term bilateral contracts, the terms of which were only known to the two parties. So far, contracts have accounted for about 97 per cent of electricity sales, so the vision of generators competing every hour of every day appears to have been abandoned. The full cost of developing and operating NETA has not been determined yet, but it seems likely that the cost over 5 years will be in excess of £1bn. Despite these high costs, there appear to be some serious design problems, particularly in the Balancing Market, the mechanism under which the System Operator buys and sells power to balance supply and demand. For example, energy sources with output that is difficult to predict, for example, wind and cogeneration, are finding the Balancing Market extremely expensive The Balancing Market also seems to be encouraging high levels of spinning reserve, part-loading and coal use. These design problems are highly damaging to the efforts to reduce environmental impacts.

2.2. The nuclear subsidy

The removal of the nuclear subsidy was partly possible because of improved performance by the nuclear company. However, it was also possible because some of the burden for paying for long-term liabilities such as decommissioning and spent fuel disposal was taken from today's consumers and passed to future taxpayers. This is unethical and contravenes the 'polluter pays' principle that the government claims to espouse. It seems that the removal of the subsidy was only possible because wholesale electricity prices were inflated. Now that wholesale prices have fallen, some form of nuclear subsidy may again be needed if the nuclear plants are to remain in service.

2.3. Environmental performance

Environmental performance, especially emissions of acid and greenhouse gases, has improved markedly (at least until the introduction of NETA) since privatisation. Two factors are behind this improvement. The main factor is the replacement of coal by natural gas as a generation source. At the time of privatisation, about three quarters of British electricity came from coal, now the figure is about a third, with much of this market being taken up by natural gas. The main factors behind this switch were strategic and economic. There was a surplus of apparently cheap natural gas from British gas fields available on long-term contracts at stable prices. This allowed the regional companies to enter the generation market and allowed National Power and Powergen to reduce their dependence (then almost total) on British-mined coal. The

other factor was the increased output from British nuclear power plants, which raised their market share from about 17 per cent to 25 per cent, also at the expense of coal.

For the future, Britain is now increasingly dependent on imported gas sold at oil-related prices and from sources that are much less secure. The nuclear output is likely to fall as the oldest stations are retired and might fall sharply if British Energy's financial problems cannot be solved. It will be very difficult to maintain emissions at their current level, much less reduce them to meet the tougher targets that will be imposed.

Experience with renewables was mixed. Use of the nuclear subsidy to support renewables produced some remarkable reductions in price and the credibility of renewables is now much higher. However, the amount of capacity installed was very small and problems of siting are beginning to restrict the scope for further plants.

3 - CHANGES TO REGULATION

The position of Director General of Electricity Supplies (DGES) was created in 1989 to regulate the electricity industry, with the support of the Office of Electricity Regulation (Offer). Offer had a staff of about 220 (about half working on consumer representation) and an annual budget of about £10m. The prime duty of the DGES was to promote competition and, legally, nearly all decisions were the joint responsibility of the DGES and the government minister that appointed him (and could dismiss him) for a five-year term. Professor Stephen Littlechild served as Regulator from 1989-98.

In 1998, changes were decided that took three years to implement. Gas and electricity regulation were merged in 1998. The DGGS (gas regulator), Callum McCarthy, was appointed to be DGES and Offer merged with Ofgas to become the Office of Gas and Electricity Markets (Ofgem). In 2000, the decision-making body became the Gas and Electricity Markets Authority rather than the DGES/DGGS. The Authority has 5 executive and 5 non-executive directors, the chief executive being the DGGS/DGES and its primary duty is to protect consumers. Consumer representation, previously carried out by Offer, was given to a new body in 2000, EnergyWatch.

Ofgem's budget is about £35m and it has about 330 staff. While it is difficult to make direct comparisons with the situation in 1990 because of the change of responsibilities and scope, it seems likely that the number of staff working on regulation (as opposed to consumer representation) has increased by about 50 per cent and the budget has more than doubled. The suggestion widely touted at the time of privatisation that regulation would be 'light' and that the need for a specific regulatory body would disappear once markets were established seems to have been hopelessly optimistic.

4 - SETTING MONOPOLY PRICES

One of the most impressive achievements of the British reforms appears to have the reductions in prices for use of the network. These make up about a third of the total retail price of electricity and prices have fallen rapidly so that by 2002, prices had almost halved. However, if we look at the detailed progress of prices (Tables 1 and 2), it is clear that something strange was happening. Regulation of these prices was to be carried out using 'incentive' or 'price-cap' regulation: the 'RPI-X' formula. Basically, under this formula, the supplier of a monopoly service is allowed to increase their prices in line with inflation (RPI is the Retail Price Index) minus X per cent. So if annual inflation was 3 per cent and 'X' was 2, prices would go up in nominal terms by 1 per cent but go down in real terms by 2 per cent. The 'X' factor, set initially by government at the time of privatisation, would apply for between 3 to 5 years and would then be revised by the Regulator.

4.1. The methodology in theory and in practice

The philosophy of this methodology was that the Regulator would set the companies a target. If they could improve their efficiency by more than X per cent, they would keep the extra earnings as profits and of they could not, their profits would fall. The Regulator should have no interest in how these targets were met, by productivity improvements or by capital investments. This was a matter for the commercial judgement of the companies. It was on this methodology that the hopes of a 'light' regulatory regime were based.

Experience with the gas industry showed that this methodology was not viable and the only way to regulate prices in a capital intensive industry such as electricity, water or gas was to relate prices to the amount of investments made. From 1993 in the gas industry and 1995 in the electricity industry, all 'X' factors have been set using a variant of rate-of-return methodology. The results are still presented as an 'X' factor but the methodology is far from that proposed in 1982 by Professor Littlechild for utility price regulation. If we look at the prices for distribution and transmission (see Tables 2 and 3), it is clear that the main price reductions occurred in the regulatory period after the change to rate-of-return methodology took place (in 1995 for distribution and 1997 for transmission).

Table 2 Electricity Transmission Regulation (1990=100)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
X	0	0	3	3	3	3	20	4	4	4	0	1.5	1.5	1.5	1.5
Price	100	100	97	94.1	91.3	88.5	70.8	68.0	65.2	62.7	62.7	61.7	60.8	59.9	59.0
Mean X		0				2				4.5					3.5

Notes

The 2001 review separated the SO function from the transmission assets business. The X factor refers to the much larger transmission assets business.

Table 3 Electricity Distribution Regulation – Seeboard (1990=100)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
X	-0.75	-0.75	-0.75	-0.75	14	13	3	3	3	21	3	3	3	3
Price	100.7	101.5	102.3	103.0	88.6	77.1	74.8	72.5	70.4	55.6	53.9	52.3	50.8	49.2
Mean X				-0.75					3.8					4.9

Note

The gross X factor for 2000 was 36, but about £30m was transferred from distribution to supply and a more comparable figure for X, taking account of this transfer was 22

The ‘X’ factors set by government were lax, presumably based on the objective of making the companies highly profitably increasing the price they could be sold for. Thus, Seeboard was able to increase its real prices by 3 per cent in the first five years. Most mature industries would expect to be able to improve their efficiency by about 2 per cent a year, or about 8 per cent over the period 1990-95, so by 1995, there should have been a considerable backlog of efficiency improvements the privatised companies could make.

The new formula adopted to calculate the allowed income over the five year forward period from the date the review was to apply from was as follows:

Allowed income =
(Value of existing investments – Depreciation + New investments)*Allowed rate of return + Operating costs

The process to determine the values in this formula takes two to three years and is a major and growing element in the workload of the Regulator. All of the terms in this equation are worthy of discussion.

4.2. Value of existing investments

To explain the steep reduction in monopoly prices, it is necessary to focus on ‘value of existing investments’, more precisely the value of investments made before privatisation. From some perspectives, the appropriate value for these assets would be their accounting value in the nationalised industry companies’ accounts. This would provide appropriate price signals to consumers. However, given that the companies were sold for only about a third of their asset value, to give the new owners a commercial rate of return on the accounting value of the assets would give them a large amount of unearned profits. The Regulator decided to set the value of the pre-privatisation assets at the sale price of the companies. Given that return on assets represents a large proportion of the allowed income of the companies, it is clear that if two thirds of the value of the assets is written off, large price reductions can be made. This was probably the most equitable decision but it had two important consequences:

- As the written-off assets wear out and are replaced by new assets purchased at full market price, the value of the asset base will rise and prices will tend to rise again to pay for these new assets;

- The price reductions were paid for by taxpayers, who lost money because assets they owned were sold for only a small fraction of their value; and

- The pre-privatisation assets were treated as one generic asset, with a remaining life from 1990 of 15 years. This decision means that unless some form of smoothing is allowed, a significant proportion of the asset base will disappear in 2005, causing difficulties for the companies in financing investment.

4.3. New Investments

Determining an accurate forecast of the new investments that will be needed is a major task. The utilities present investment plans to the Regulator who carries out detailed assessments using consultants and eventually arrives at an agreed value of investments that can be made. This process is getting more complex and the Regulator is now using sophisticated engineering and statistical analyses to rank distribution companies by the efficiency of their investment programmes and is introducing measures to force the worst companies to come up to the level achieved by the best.

Use of the new formula carries the same risk (the Averch-Johnson or 'gold-plating' effect) as traditional rate-of-return regulation. It provides an incentive to over-invest, because the more investments that are made, the more profits the companies make. In practice, the utilities always invest less than they are allowed to invest (typically they invest about 90 per cent) and earn extra profits until the next review when the value of the forecast investment programme can be replaced by the actual amount invested. They also delay investments till the end of the regulatory period so they can earn a return before they make the investments. The Regulator has a difficult decision to make when companies under-invest. If he penalises them, the companies will have no incentive to find efficiency gains that will reduce the amount they have to invest, but if he does not, the companies will make unearned profits. In practice, regulators in all utilities have frequently had to warn companies about underinvestment but have not taken sanctions yet. The issue of what to do if it is found that investments the company did make were found to be unnecessary is also unresolved.

The major weakness of the system for estimating future investment needs is that it requires the Regulator to effectively make investment decisions, counter to the spirit of 'incentive' regulation and against the principles of US rate-of-return regulation.

4.4. Allowed rate-of-return

Another element accounting for the price reductions in monopoly prices has been the reduction in the allowed rate-of-return. The distribution price review of 1995 allowed companies a 7 per cent real return on assets, while the most recent reviews have used 6.25 per cent. It might be expected that this term would be uncontroversial: it should clearly be related to the cost of capital to the company. However, the cost of capital to a company is determined by the riskiness of its business and the performance of the

company. If Regulators start to take a more aggressive stance clamping down on underinvestment and in assets built that were not cost-effective, the market will view the company as more risky and will increase the cost of borrowing. Equally, if the company performs poorly and its credit rating falls the Regulator must decide whether to pass on the additional borrowing costs to consumers, penalising consumers for the company's poor performance. Or he must make the company pay from its profits, perhaps damaging further its financial status and perhaps putting the company at risk. Either way, any benefits from tougher regulation may be lost because consumers will have to pay for them with higher rates of return.

4.5. Operating costs

It is likely that most observers, aware of the job losses in the electricity industry, attribute the price reductions to improved static efficiency. However, if we examine the formula and note that the rate-of-return and operating cost elements of the companies' incomes are comparable in size, it is clear that no conceivable improvement in static efficiency would have been sufficient to account for more than a small element of the price reductions. In fact, the number of job reductions attributable to the impact of privatisation is very difficult to estimate accurately. The Regulator is now beginning to use sophisticated statistical and engineering methods to rank distribution companies by their efficiency and is using these rankings to set operating cost reduction targets to force the least efficient companies to come up to the standards of the best.

4.6. New developments

The Regulator is now introducing measures that will relate the income they receive to the quality of service they provide. These activities will be on top of the existing arrangements described above for determining 'X' factors and will make regulation even more complex and expensive. They will require the installation of large amounts of monitoring equipment so that the reliability of the network can be accurately determined. These new measures clearly have some rationale but whether in practice they will be a useful addition to regulation remains to be seen.
The other important development, which will make regulation more difficult, is concentration in the distribution sector. At privatisation, 14 separate regions of Britain existed, ample to allow 'yardstick' comparisons. However, after mergers and take-overs in the last couple of years, only 8 independent companies remain, one of which is selling up, perhaps leaving only 7 companies. Further concentration is likely and this will make yardstick comparisons much more difficult (see Table 4).

Table 4 Distribution industry structure: 1990 and 2002

1990	2002
1. London	
2. Eastern	
3. Seeboard	1. EDF
4. SWEB	
5. SWALEC	2. The Southern Co (USA)
6. South Scotland (Scottish Power)	
7. Manweb	3. Scottish Power
8. North Scotland	
9. Southern Electric	4. Scottish and Southern
10. Norweb	5. North West Water
11. Yorkshire	
12. Northern	6. Mid-American Energy Holdings (USA)
13. East Midlands	7. Powergen (E.ON)
14. Midlands	8. Aquila (USA) – For sale

Overall, no rigorous analysis has been carried out to determine precisely how far reductions in monopoly prices have been generated by genuine efficiency improvements (as opposed to asset write-offs or lower rates of return). Until this analysis is done, one of the fundamental tenets of electricity reforms, that tough regulation of privatised utilities will create greater efficiency improvements than the previous system would have done remains untested.

5 - REGULATING INDUSTRY STRUCTURE

The desired structure behind the British reforms was never made explicit, but the implicit structure is clear. Companies involved in activities that would remain a monopoly (essentially network activities) should not be involved in competitive activities (generation and retail supply). This should ensure that those involved in competitive activities can gain non-discriminatory access to the network. There should be some separation between companies involved in generation and those involved in retail supply to final consumers. If generation and retail supply were integrated, the wholesale market would not be a primary price-setting forum as integrated companies would be generating to supply their own consumers.

On separation of network activities, the Regulator has been successful. He forced the regional distribution/retail supply companies to sell their stakes in the National Grid Company in 1995 and, in 2001, he forced the regional companies to make a full physical separation of their retail and distribution businesses.

5.1. Vertical integration

However, on the issue of vertical integration of generation and retail supply, the government and the Regulator have caved in and the British market is dominated now by six large integrated generator/retailers.

The government was always ambiguous about integration. From 1990, the regional retail supply companies were allowed to build their own power plants and the generators were allowed to supply free consumers directly. These were probably pragmatic decisions intended to give competition in generation and retail supply a 'kick-start'. If regional companies had not been allowed to build generation, it is hard to see where competition to the National Power/Powergen duopoly would have come from, and equally, without competition from National Power/Powergen, competition in retail supply for large consumers might have been slow to emerge. The situation became more confused in 1995 when Scottish Power was allowed to take over a regional company. At that time, Scotland was commercially separate from England & Wales but physically connected. Improvements to the connections were underway and it was clear that Scottish Power would be able to operate as an integrated company in England & Wales. A regional company, Eastern, had bought the plant the Regulator had forced the duopoly to sell, also creating a large integrated company. However, the proposed take-over in 1996 of regional companies by both National Power and Powergen caused government to think again. These two companies still had immense power in the generation market and allowing them to take over regional companies would have been a risk to competition and the take-overs were prevented. Only two years later, renewed take-over bids by the duopoly were allowed.

What had changed was that their market share in generation had fallen and the government required, as a condition that the duopoly sell more of its plant to new entrants. National Power and Powergen were also experiencing financial difficulties because long-term gas contracts they had signed had proved to be over-priced. Between them, the two companies had to write off about £1.5bn in 1998/99 on these contracts. The government may have been concerned that these problems had so weakened the companies they would have been vulnerable to foreign take-over. Allowing them to integrate appeared likely to give them more strength. In fact, this protection was ineffective. In 1999, National Power had to split itself into a UK business and an international business. The UK business was taken over by RWE in 2002 while Powergen succumbed to E.On in 2001.

The decision on vertical integration of National Power and Powergen opened the floodgates to integration and by 2002, the 14 retail businesses of Britain (12 in England & Wales and two in Scotland) had all been taken over by generators. Now six integrated companies dominate generation and retail supply. RWE, EDF and Scottish & Southern each own three regional companies, TXU and Scottish Power both own

two and E.On owns one company (see Table 5). There is every prospect that in the next year or two, further mergers and take-overs will leave just three or four dominant companies. It is highly questionable whether this would represent a competitive structure.

The issue is whether, if there is to be competition in electricity, there is an alternative to vertical integration of generation and retail supply. As stand-alone businesses, both generation and retail supply are highly risky businesses. Investment in new power plant will be seen as highly risky if the plant owner has to sell the output into a competitive market in which the prices and volumes sold will not be predictable from one day to the next. For a standard product like electricity, retail suppliers will quickly lose their market share if they cannot match the cheapest prices on offer. The evidence from California and Brazil, where integration was not allowed and investment in new generation collapsed after liberalisation, is not encouraging. Investment in new generation in Britain continued after privatisation because of the failure of the wholesale market to bring down prices. New generators could produce power at well below the market price and it seemed that investing in new plant was low risk. Now that the wholesale price has fallen in Britain, new investment will be much riskier. However, if the market is dominated by a handful of integrated companies, the risk to security of supply may be minimised. Integrated companies will tend to ensure they have enough capacity to supply their own consumers reliably. So supply security may be improved by integration, but the price will be much reduced competition.

Table 5 Retail supply industry structure: 1990 and 2002

1990	**2002**
1. London	
2. SWEB	
3. Seeboard	*1. EDF
3. Eastern	
4. Norweb	*2. TXU
5. South Scotland (Scottish Power)	
6. Manweb	*3. Scottish Power
7. North Scotland	
8. SWALEC	
9. Southern Electric	*4 Scottish & Southern
10. Yorkshire	
11. Midlands	
12. Northern	*5. Innogy (RWE)
14. East Midlands	*6. Powergen (E.ON)

5.2. Corporate concentration

The international process of concentration in electricity companies is ominous. In 1975, Anthony Sampson wrote about the 'Seven Sisters', the seven companies that controlled world oil markets. In fact there were three big sisters (Shell, Exxon and BP) and four others and now, after mergers and takeovers in the past 5 years, only four sisters survive. The electricity industry seems to be moving in the same direction, with three 'big brothers', EDF, RWE and E.On and other companies, such as Vattenfall, Endesa and Enel desperately trying to grow large enough to compete.

Belatedly, European governments are beginning to notice this trend, but the reaction of the competition authorities in the European Commission is truly shocking. Their attitude is: many products are delivered by oligopolies: we know how to control such markets. The evidence for this statement is thin, while it leaves the Electricity Directive, a measure that was supposed to bring in dynamic competition to the electricity, not reduce it to a cosy oligopoly, looking like a confidence trick played on consumers. The remaining smaller electricity companies will be steadily picked off especially when, as will inevitably happen, they make a mistake. National Power and Powergen were weakened by expensive gas contracts, while Scottish Power may now be vulnerable because of the losses its US subsidiary made in California.

6 - PROTECTING SMALL, ESPECIALLY POOR CONSUMERS

The plan to introduce retail competition for all consumers was politically important. The privatised gas company was becoming unpopular and the fact that small consumers would be able to punish electricity companies that gave them poor service or high prices by taking their business elsewhere helped sell electricity privatisation. However, there was then little understanding, in government, the companies and with the Regulator about how it would be possible to allow consumers to choose. Nevertheless, there was a strong belief that if a competitive solution was feasible, it would inevitably be superior to a monopoly solution. The question of whether the benefits of competition would outweigh the costs was not addressed.

6.1. The introduction of competition

Competition was introduced in three steps. The largest 5000 consumers representing about 30 per cent of demand were given choice immediately on privatisation in 1990 and a further 50,000 consumers (20 per cent of the market) were given choice in 1994. There were serious practical problems from metering and data processing in the first 18 months in both cases, but consumers soon found that their bills could be reduced and most now change supplier annually or renegotiate better terms with their existing

supplier. However, it was the plan to allow all consumers choice from 1998 that caused the worst practical problems. The process was only completed a year after the scheduled date and the cost to consumers over five years of the systems needed to allow them to switch was £726m: four or five times the amount expected. The existence of consumer competition also complicated and raised the cost of the new wholesale market, NETA. Much of the complication seems to arise because there is no economic way to meter the consumption of small consumers on the half-hourly basis that would be necessary to account for costs accurately. The stop-gap solution, 'profiling', under which half-hourly consumption is estimated by assuming that the daily load profile of all small consumers is the same, is a very inadequate substitute.

6.2. Retail competition in practice

However, the more fundamental question is whether small consumers will ever be able to exert enough competitive pressure to ensure they pay fair prices and whether the poorest consumers can be protected from the additional risks that retail competition brings. The initial evidence from Britain is not encouraging.

In 1997, when small consumers were still captive to their local supplier, the Regulator published data (Table 6) showing that small consumers were paying about 30 per cent more for the generation element of their electricity than consumers that could choose. Retail supply companies were systematically allocating their expensive purchases to the captive market and their cheap purchases to the competitive market. At that time, generation costs represented about 50 per cent of a typical household electricity bill, so if costs had been fairly allocated, small consumers bills would have been about 5 per cent lower and large consumers' bills about 10 per cent higher (generation is a higher proportion of large consumers' bills).

The Regulator cited this data as evidence of the need to allow small consumers to choose, suggesting that if there was choice, small consumers would switch to cheap suppliers and retail suppliers would not be able to continue this discrimination. He did not explain why he allowed the companies to discriminate in this way, in apparent conflict with his statutory duties.

Table 6 REC Purchase Costs – 1996/97

	Average price (p/kWh)	Quantity (TWh)
Franchise consumers		
Coal contracts	3.92	71.7
IPP contracts	3.84	28.9
Other contracts	3.71	34.3
Average franchise purchase costs	3.85	134.9
Non-franchise purchase costs	3.00	80.4
Average total purchase costs	3.54	215.2

Source: Office of Electricity Regulation (1997) 'The competitive electricity market from 1998: price restraints: proposals' OFFER, Birmingham.

The idea that small consumers would have the resources, incentives and interest to regularly change their electricity supplier always seemed unrealistic and in most countries where small consumers have choice, switching rates are low (10 per cent or less). In Britain, small consumers can now choose from the six remaining integrated generation and retail supply companies and British Gas. No new entrants have won any significant market share. About a third of small electricity consumers have switched, but nearly all those switching have chosen to buy gas and electricity as a package from British Gas, the most expensive supplier in the market. It appears that while consumers may believe they are getting a good deal from British Gas, they also value buying such an important commodity from a tried and trusted supplier.

The message for electricity suppliers is clear: small consumers are generally not interested in shopping around. Hence all companies in the retail electricity sector except for British Gas acquired their businesses by buying the former monopoly retailers, paying up to £200 per consumer. Advertising and other sales techniques are an expensive and ineffective way to win consumers. Given that the profit level to a retailer on a typical consumer is probably no more than £20-30 per year, companies obviously assume that most consumers will never switch supplier and that, in addition to electricity, it will be possible to sell their consumers a range of other, more profitable services.

Small consumers generally do not have the resources to identify the cheapest deal, and they are influenced by other factors such as brand loyalty. The obvious strategy for the integrated companies is to keep prices high and not provoke a price war. This strategy is graphically illustrated by the movements in prices since 1999.

The wholesale electricity price has fallen by 35 per cent since 1999. While this should have been a good thing for consumers, none of this price reduction has been passed on to small consumers. The price large consumers pay for generation has only fallen by 22 per cent while the price paid by small consumers has actually increased by 5 per cent. The integrated generation/retail companies have simply transferred costs from generation to the retail supply element of the bill and the overall price paid by small consumers remains largely unchanged. This strategy has advantages other than maintaining the integrated companies' high profits in the residential sector and has cost them nothing. It appears to show to the Regulator that the generation market is now competitive and it also forces the non-integrated generators, who have seen their income fall by 35 per cent, out of the market reducing the scope for competition.

If price reductions in the wholesale market had been passed on, the overall price small consumer pay for their electricity would be about 30 per cent less than it actually is. It might be expected that in the face of such blatant exploitation there would be serious public concern. The problem is that prices of electricity are falling, driven by regulatory reductions in monopoly prices and, understandably, the British public is more concerned about services that blatantly are going wrong, such as the rail system and the air traffic control system, rather than one which is still delivering a reliable service at falling prices. The Regulator, having promoted the introduction of competition is unlikely to now admit it was a mistake, while consumer groups have been too keen to continue to preach the virtues of competition.

6.2. The impact on poor consumers

Fuel poverty is defined as when more than 10 per cent of household income is spent on fuel. About 20 per cent of UK households fall into this category. Fuel poverty generally has two aspects: the first is low household income and the second is inefficient and expensive heating systems that the occupant does not have the resources or the capability to improve.

It is this second attribute that distinguishes fuel poverty from poverty in general. It has also tended to be the more difficult aspect of the problem to address because of the difficulty of devising equitable programmes to improve the quality of the housing stock. However, the measures to liberalise electricity markets introduce new risks for poor consumers, which may mean that, for the poorest people, the problems could become even more intractable.

In a competitive electricity market, the trend in Britain and elsewhere in Europe has been for electricity retailers to offer their consumers a range of household services. For example, British Gas offers gas, electricity, telecoms, a credit card, insurance, financial services and roadside vehicle breakdown recovery. Selling just one commodity to a consumer is probably not very profitable but a package can be much more profitable. For such a strategy to work, the company needs to be able to target effectively richer consumers who will have the resources to buy such a package. This means that the poorest consumers are inevitably not going to do well from the introduction of competition because competing companies will have no incentive to compete for their business.

6.3. Pre-payment meters

Pre-payment meters (PPMs) have played a key role in protecting (or at least appearing to protect) poor consumers. After its privatisation, British Gas adopted a much tougher stance towards consumers that could not pay their bills, and the number of consumers cut off increased markedly, bringing the process of privatisation into disrepute. To avoid this recurring with the electricity industry, a new type of pre-payment meter operated with 'smart cards' individual to each consumer was introduced for consumers with difficulty paying their bills.

The smart cards recorded the account details of the consumer and could be recharged at local outlets, such as newsagents. This system is complex and while the retail companies did have the advantage of being paid in advance for their power, the cost of the extra infrastructure (the new meter and the connections at shops) was significant. The Regulator capped the extra cost that could be passed on to PPM consumers requiring that they pay no more than 5 per cent more than standard rate consumers. This did not concern the retail supply companies because any costs not recovered from PPM consumers could be spread amongst other franchise consumers.

If the consumer had accumulated debt, some of the money paid by the consumer to charge the card went to paying off the debt. For the consumer, there were significant advantages with this system. They could continue to receive a supply of electricity even if they had not paid their bills. They also did not need to fear receiving a bill of unpredictable size once a quarter. This was particularly valuable for pensioners who did not heat their dwellings adequately because of fear of receiving a bill they could not pay. Of course, if they really could not afford their bills, a PPM did not help them.

PPMs also had an important advantage for retail electricity supply companies and the government. They did not incur the expensive and politically damaging cost of cutting off consumers that could not pay their bills. Consumers that could not pay their bill disconnected themselves. The extent of the fuel poverty problem was masked. There is no ready way to determine the extent of self-disconnection.

Nevertheless, PPMs have proved popular with consumers and now about 15 per cent of consumers pay by this means. They may well be aware that they are paying a higher price for their power, but, in the same way as pre-payment mobile phones are popular despite high call charges, they value the extra control over tight household budgets that the PPM gives them.

6.4. Price comparisons

To overcome the problem of the difficulty of comparing the various offers, the Regulator and EnergyWatch publish charts on the internet that allow easy comparison of prices.[1] These are good but few consumers are aware of these comparisons and many consumers do not have the skills or the resources to access them. It is also worth noting that these price comparisons change frequently and a consumer choosing the cheapest supplier might find a month later that they no longer have a good deal. All major electricity suppliers try to sell gas as well as electricity in a so-called dual-fuel offer

There are three ways to pay gas and electric bills in Britain.

- By Direct Debit (DD). These are the most attractive consumers for competing suppliers to target. They have an orderly bank account (a surprisingly large number of people in Britain do not have a bank account, much less one that would allow them to use DDs) and are probably rich enough to want to buy other services provided by the company.
- Quarterly in arrears. This is the normal method.
- Pre-payment meter (PPM). Consumers that have difficulty paying their gas or electricity bills have little choice but to install a PPM.

There are less obvious barriers to competition for poor consumers. All licensed gas and electricity suppliers are obliged to offer a supply at the posted prices to any consumer that requests it. However, the supplier can ask for a cash deposit of any size. They might do this if a consumer has a poor payment record or has unpaid debts. If a company does not want a new consumer, it can simply ask for a prohibitive deposit. So even where PPM consumers could make savings in theory, in practice these savings might not be achievable. A consumer that cannot afford their electricity bill is hardly likely to be able to find a deposit of, say, £200.

[1] (http://www.energywatch.org.uk/uploads/London_Price_Comparisons.pdf)

To illustrate the choices that face small consumers, let us look at a consumer in London (other regions would show the same picture) using average amounts of gas and electricity (Tables 7 and 8). For consumers that do nothing, i.e., they continue to buy electricity from London Electric and gas from British Gas, the following prices would apply (before tax). The cheapest offered price is in brackets (excluding very small companies).

Table 7 Prices for consumers in London that do not switch (£/year)

	DD	Quarterly	PPM
Gas	314 (271)	347 (288)	347 (322)
Electric	236 (214)	247 (223)	255 (244)
Total	550 (485)	594 (511)	602 (566)

If this consumer were to switch to a dual fuel offer, the results would be:

Table 8 Dual fuel offers for an average consumer in London (£/year)

	DD	Quarterly
British Gas	522	566
London	510	533
Best (npower)	482	518
Worst	British Gas	British Gas

The following factors emerge:

- Even for consumers that do not switch, PPM consumers pay nearly 10% more than DD consumers;
- There is no saving to be made by taking a dual fuel offer compared to buying electricity and gas separately from the cheapest suppliers;
- Despite being the most expensive supplier in the market, British Gas is the only company in the electricity market gaining significant market share;
- Savings achievable from switching for DD and quarterly consumers are about 12%, whereas for PPM consumers, the best saving (not necessarily achievable) is about 6%.

In short, consumers that are rich and smart will pay 20% less than a PPM customer and can reduce their bill by about 12%. Whether many such consumers are likely to go to much effort to make a saving of perhaps only £6 per month is questionable.

7 - CONCLUSIONS

In some respects, the Californian system was the model that would have been introduced in Britain if the government had had the nerve to do it. Evidence is growing that the model in its pure form would not have been sustainable. If competition had been as intense as planned, the generation sector would have become too risky to allow new investment and the retail supply sector would not have been viable as a stand-alone business. Retail competition seems to have benefited only large consumers, often at the expense of small consumers. Regulation of the remaining monopolies is becoming increasingly complex. Reliability does not seem to have been compromised so far in Britain, but experience in the rail industry, where a comparable structure led to serious under-investment in infrastructure suggests that system reliability cannot be assumed.

For countries that have reformed, a return to the old model is not now plausible. The challenge is therefore to adapt the new system so that it retains the better points of liberalised industries but does not suffer from the lack of control that led to the problems suffered by California and Brazil. The better points are the increased cost-consciousness and the removal of the often-stifling role of a central dominant company. However, a new system will require a much greater degree of planning to ensure security of supply, to allow environmental objectives to be met and to ensure that the poorest consumers are not left with an expensive second-class service. This will certainly not reduce the role of the regulator. The Regulator will continue to have a role in setting monopoly prices, but will also have to play an enhanced role in the areas that were expected to be taken over by markets: generation and retail supply.