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EMPIRICAL REFLECTIONS ON THE LIBERALISATION OF THE UK ELECTRICITY SUPPLY INDUSTRY

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EMPIRICAL REFLECTIONS ON THE 'LIBERALISATION' OF THE UK ELECTRICITY SUPPLY INDUSTRY

As the UK Electricity Supply industry marks both 10 years since the beginning of privatisation and engages with further upheaval as the New Electricity Trading Arrangements (NETA) are introduced, it is an appropriate time to review the results of what has been a landmark experiment in mixing the market with electricity. This task is approached by first of all looking at those aspects of 'liberalisation' which are popularly supposed to have been revolutionary: the introduction of a novel form of 'competition' to electricity generation and the conferment of significant benefits on consumers by way of competition in both generation and supply (marketing), reinforced by the 'incentive regulation' of transmission, distribution and supply (for domestic consumers). Secondly, the changes which have occurred in the structure of generation and the ownership of the industry are identified and their implications discussed. The first two sections are restricted to England & Wales, the remainder takes in the whole of the UK.

ELECTRICITY GENERATION AND 'MARKET SOLUTIONS'

Apart from the technical characteristics of electricity as a commodity (homogeneity, cannot be stored, electricity consumed cannot be linked with a specific source of generation), the first clear indications that electricity generation is particularly unsuitable for market solutions came before privatisation. The scale of the state-owned Central Electricity Generating Board's (CEGB) past, very 'lumpy' investments in plant, particularly its investment in nuclear capacity, meant that the kind of corporate structure which might have been conducive to the introduction of a competitive market in generation could not be achieved. Perhaps there was an opportunity once the nuclear capacity was withdrawn from the sale, but this happened too late in the day to upset the political timetable. Secondly, the coal industry had to be protected with medium-term contracts at predetermined prices, covering 70% of the market between 1990 and 1993 and about 40% between 1993 and 1998 (Thomas 1999) and requiring corresponding back-to-back contracts in the Regional Electricity Companies' (REC) franchise market. Thirdly, the 'stranded costs' of nuclear power still had to be addressed

with a subsidy via the Fossil Fuel Levy, sheltering it from market forces (17-25% of the market). Fourthly, imports from France and Scotland (about 10% of the market) were not market-driven. Finally, and ostensibly in order to counter these offences against the rule of the market, the RECS were allowed to take risk free equity stakes in Independent Power Projects (IPPs) – they were, in effect, allowed to sell to themselves and all costs, whether foreseen or unforeseen, could therefore simply be passed on to their customers in the franchise market.

None of this is of course an indictment of the market as such which, like the road to a communist society, is always distorted by pragmatic implementation which fouls up the theory. But in the case of an industry like electricity the problems were always likely to be more severe and ongoing, as the political compromises which inevitably encumber the start-up assume a life of their own and produce their own distortions. The main case in point here is the 'Pool', the place where the competitive action was supposed to take place – or was it?

The Pretend Market

While the UK's experience with electricity privatisation has not witnessed a great deal of clear thinking, it has certainly seen a lot of *cleverness*. Here the 'Pool' definitely takes pride of place as the '*pièce de résistance*'. Its cleverness came not only in the ingenuity which went into designing complex trading and dispatch arrangements, but also in presenting it *as if it were a real market*.

This point, it should immediately be said, is not a reference to the fact that the 'Pool' has been criticised for being 'half a market' (only embracing the supply side). Rather it reflects what we can already sense from the foregoing, namely, that the Pool could not be a market in any meaningful sense of the word because the financial returns to participants were mainly to be determined outside the 'Pool' by the aforementioned contracts. What then was the role of the Pool during its lifetime?

The main clue here is that all participants in the Pool would receive the 'System Marginal Price' (SMP-the price of the last unit bid in to meet a particular level of

electricity demand). The main piece of evidence is that participants felt able to bid in some of their plant, some of the time, at zero (OFFER 1998, p.18). And why could they do this? The answer is that their revenues were either covered by contracts outside the Pool ('Contracts for Differences') or by the eventual SMP. And why would they wish to do this? The answer is that for participants the main concern is to get their plant *utilised*. And why is this a particular issue? Well, it is mainly down to the particular characteristics of electricity generation: nobody builds or operates a power station to have it operate at low levels of capacity; with large fixed costs the economics can be badly affected.

Lifting the veil of the 'Pool' in this way, showing it not as a market but as a new device for establishing the 'merit order' of plant utilisation, might suggest that it was simply fulfilling a more ancient role from the days of nationalisation (indeed the Pool's new software was an adaptation of the old, cost-based merit order system). Jumping too quickly to such a conclusion would, however, be completely mistaken because it does not take into account the cleverness exhibited by the participants in the new system. As the House of Commons Energy Committee recognised as early as 1992 (HOC 1992), the participants in the Pool did not necessarily behave like gentlemen. For example, and an example of spawning from the initial structure, the largest generator (initially National Power) would be aware that at times of peak demand its marginal plant would become in effect monopolies, and it would bid up the SMP accordingly, creating a pleasant comfort zone for its 'competitors' (associated with the 'price spikes' that provoked both large industrial consumers, and eventually the Regulator in 1993). To this we can add further 'anomalous behaviour', such as manipulating plant availability to maximise capacity payments (the value of which were inversely related to the margin of reserve capacity). The end result was a perverse merit order with the schedule of plants which generally deviated considerably from a cost-based merit order, initially at the expense those large consumers who were wholesale customers (as we shall see below). "it fails to stimulate a rational merit order system", said the House of Commons Energy Committee (HOC 1992, paragraph 106).

Before leaving the subject of the 'Pool', we should however perhaps ask whether its pretensions to be a market may be rescued by the claim that contract prices outside the Pool in fact reflected the determinations of the Pool. Whether or not this claim can be substantiated by evidence (and usually it isn't), it takes us into difficult territory because it can equally be claimed that the bidding strategies of participants actually reflect their contract positions and involve a complex interplay between these positions, the likely gains from sales through the Pool at particular times of the day and week and the portfolios of plant held by particular generators. Perhaps the best that we can do here is adopt the position taken in by OFFER in its 1998 Review of Electricity Trading Arrangements. Upon finding that two different generators bid in similar single coal-fired units in a radically different way during the same week, it concluded, "In both cases, factors other than the direct costs of production seem to have influenced these strategies."(OFFER 1998, p.18). In other words, even at its death, the Pool remains a mystery rather than a market.

CONSUMERS AND 'MARKET SOLUTIONS'

The litmus test for any market solution must be whether competition actually reduces prices for consumers, thereby achieving a more efficient allocation of society's resources. Addressing this question, however, needs to be prefaced by a very serious health warning: establishing what has happened to prices means trying to plough a furrow through "lies, damn lies and statistics". Analysing electricity price statistics provides perhaps the most fruitful terrain for the manipulation of statistics to suit the user's tastes.

Assessments of what has happened to electricity prices since privatisation range from the uncritical (e.g. CRI 1998) to the brilliantly erudite (Turvey 1997). The first problem is that there is no such thing as an 'electricity price' – various proxies have to be taken. If the proxy is a composite price then the so-called 'Index Number Problem' rears its head: should the composite be 'base-weighted' or 'current-weighted', either of which will yield different results. If the proxy is a 'typical customer', no real person or organisation will ever admit to having had

this experience (just as nobody ever identifies with averages). Then there are other preliminary considerations such as:

- Are the prices annual averages or yearend?
- Is the year a financial year or a calendar year?
- Are they for England & Wales, GB or the UK?

Then an alarming array of possibilities raises its head:

- What should be the base year?
- Are we interested in the level?
- Or the rate of change?
- Are we interested in nominal or real prices?
- If we're interested in real prices, what should be the deflator?
- Should we include or exclude VAT?
- If the comparison is an international one, should we include or exclude VAT, include or exclude municipal taxes? What exchange rate should we use? And into which currency? Should we go for 'Purchasing Power Parity'?
- To what extent should prices have risen or fallen as a result of changes in input prices?
- Should a proper evaluation of the impact of market solutions be compared with what might have happened without an ownership change (the counter-factual position)?

To cope with these problems, here the behaviour of electricity prices is addressed in three different ways: firstly by looking at industrial prices overall, secondly by looking at retail consumers overall and thirdly by looking at a 'typical' domestic customer of one of the RECs. The base year is taken to be 1987 in order to take into account the impact on prices of preparations for privatisation.

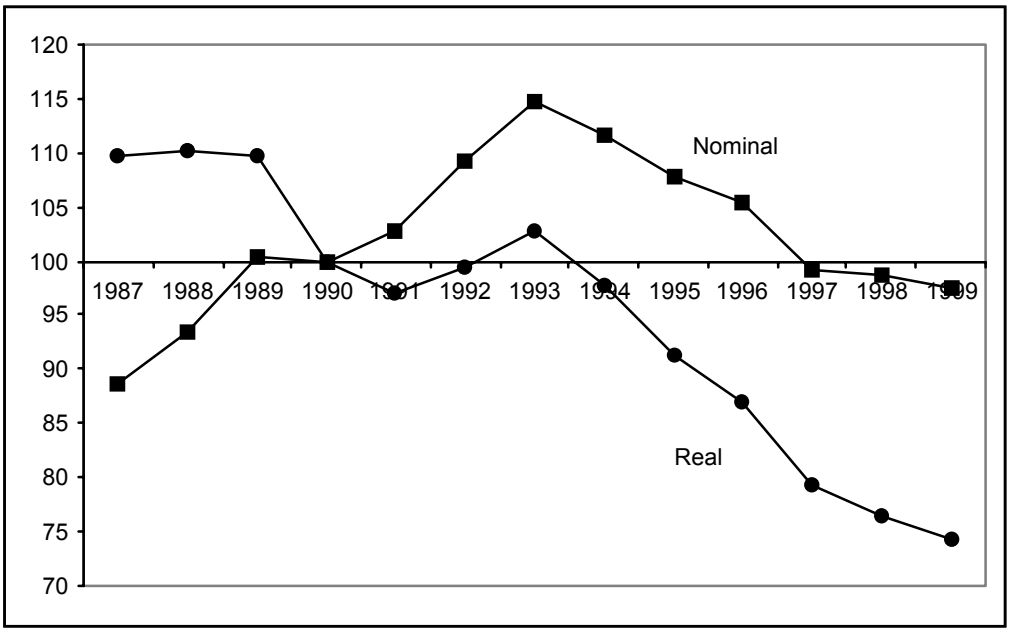
The data for industrial prices in Table 1 and Figure 1 immediately illustrates a number of the statistical problems, starting with the fact that the main official source data is for Great Britain when it would have been preferable to isolate England & Wales. Nominal prices rose sharply to 1993 and then fell by 1999 to slightly below the 1990 level. Real prices (deflated, as is conventional by the Retail Price Index) rose slightly to 1993 and then fell sharply to 1999. Compared

Table 1: Average Electricity Prices Paid by Industrial Consumers 1988-1998 (GB)

	1987	1988	1989	1990	1991	1992	
Pence/KWh	3.295	3.473	3.730	3.718	3.825	4.061	
Nominal (1990=100)	88.7	93.4	100.3	100.0	102.9	109.2	
Real (1990=100)	109.8	110.2	109.8	100.0	97.1	99.5	
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	1999
Pence/KWh	4.263	4.150	4.007	3.916	3.687	3.667	3.623
Nominal (1990=100)	114.7	111.6	107.8	105.3	99.2	98.6	97.4
Real (1990=100)	102.7	97.7	91.2	87.0	79.4	76.4	74.2

Source: *Digest of UK Energy Statistics*

Figure 1: Average Electricity Prices Paid by Industrial Consumers 1990=100



with 1987, however, the absolute nominal level of prices being paid in 1999 was 10% higher. Another way of looking at it is to say that average real electricity

prices for industrial consumers, declined by an average of 2.6% per annum between 1990 and 1999 - although this is could be adjudged a somewhat misleading representation given the way that prices actually behaved from year to year over the period (Figure 1).

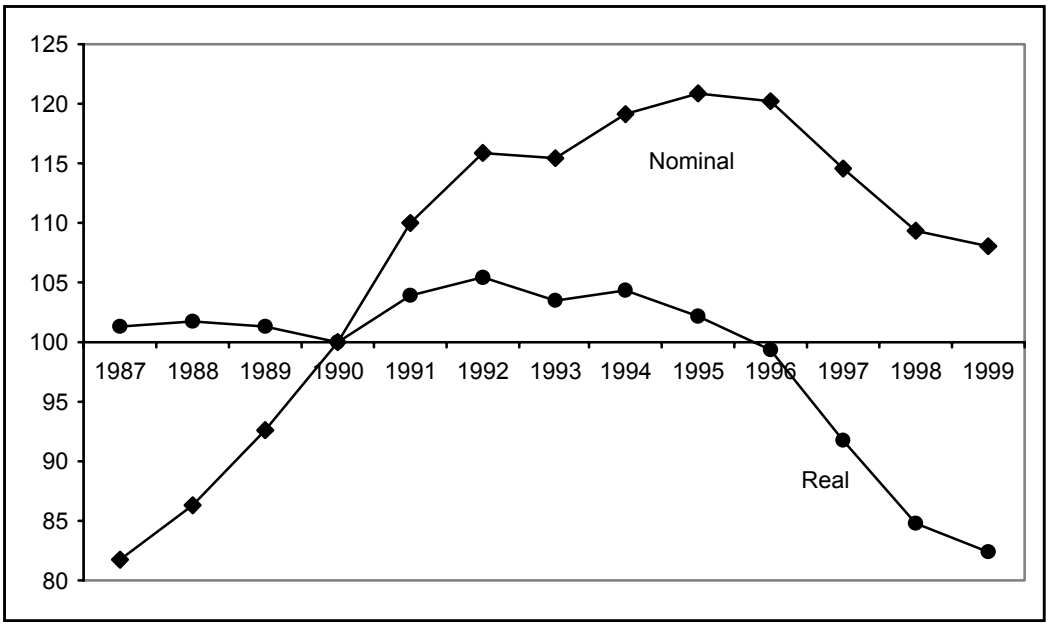
Turning to retail customers, we begin with a composite index and compare it with the Retail Price Index, of which it is a component. Table 2 and Figure 2 show that nominal electricity prices to retail customers rose sharply, by 20%, to 1995 and 1996 and then fell back in 1999 to about 8% above their 1990 level. In 1999 they were however 32% above their 1987 level – before the government began

Table 2: Indices of Electricity Prices to Retail Consumers 1987-1999

	1987	1988	1989	1990	1991	1992	
Nominal (1990=100)	81.8	86.3	92.6	100.0	110.1	115.8	
Real (1990=100)	101.2	101.8	101.3	100.0	104.0	105.5	
	1993	1994	1995	1996	1997	1998	1999
Nominal (1990=100)	115.4	119.2	120.8	120.3	114.5	109.3	108.0
Real (1990=100)	103.4	104.3	102.2	99.3	91.7	84.7	82.3

Source: *Digest of UK Energy Statistics*

Figure 2: Electricity Retail Prices (1990=100)



boosting electricity prices in preparation for privatisation. In real terms electricity prices fell by about 1.8% per annum between 1990 and 1999 – although again such a measure is a somewhat misleading representation given the way that prices actually behaved from year to year over the period (Figure 2).

At this point our commentary could branch off in a number of different directions. The first observation could, for example, be the straightforward one that these achievements for the consumer are not staggering, particularly when the decline in the nominal prices of the main fuel inputs, particularly that of coal, is taken into consideration (Table 3 and Figure 3).

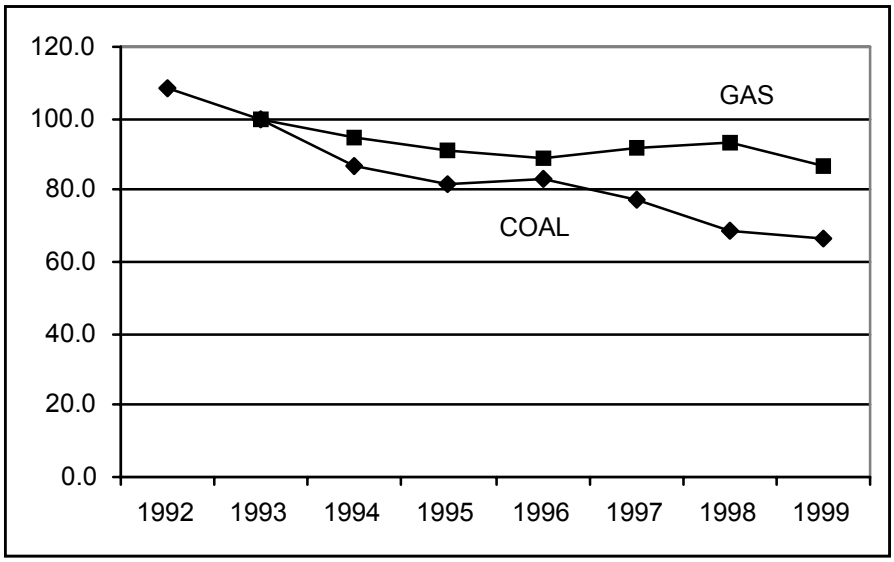
Table 3: Average Prices of Coal & Gas Purchased by Major UK Power Producers

	1992	1993	1994	1995	1996	1997	1998	1999
Coal:pence per KWh (energy content)	0.663	0.611	0.528	0.500	0.507	0.474	0.421	0.405
Gas pence per KWh (energy content)	na	0.706	0.667	0.643	0.628	0.647	0.656	0.613

Source: *Digest of UK Energy Statistics*

Note: Generators' contractual positions did affect their ability to take advantage of the fall in gas prices– see Table 6.

Figure 3: Coal and Gas Input Prices (1992=100)



A second thought could be to recall the supernormal profits made by the generators, the RECs and the National Grid, but this point has been made many times before and extent of these profits, and of what might have been for the consumer, has been well-documented (see especially Parker 1997).

Instead, and in order to reveal a little more about 'market' solutions for electricity, we shall focus on why electricity prices fell at all and why industrial consumers eventually enjoyed a better outcome than domestic consumers. Of course the question of why industrial consumers fared better than domestic consumers may, on the surface of things, seem easy to answer: the industrial consumer had had the benefit of supply competition during this period, while domestic consumers had not. But this answer would be entirely unsatisfactory: supply (marketing) only represents a minor part of the cost of electricity (between 1% and about 6%, depending on the scale of consumption and the year selected), whereas generation, an arena of 'competition', contributes the largest part of the cost electricity (more than 50%) and affects the prices paid by all classes of consumer.

These issues are best illuminated by first of all looking at the components of a 'typical bill' for a domestic consumer, in this case one of Seeboard's residential customers with an annual consumption of 3,300 KWh per year.

Table 4: The Components of a Typical Domestic Bill

(corrected for inflation)

	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98
Typical Bill (1990=100)	100	107	105	103.5	97.7	89.5	87.2	81.8
Total Regulated Charge	46.6	48.0	48.0	46.7	46.2	41.5	38.0	29.5
Generation Charge as Residual	53.4	59.0	57.0	56.8	51.5	48.0	49.2	52.3
Generation as % of Bill	53.4	55.1	54.3	54.9	52.7	53.6	56.4	63.9

Source*:* based on Thomas (1999, Table 9)

Table 4 reveals an interesting picture. The total regulated charge comprises the transmission, distribution and supply charges plus the Fossil Fuel Levy, with the distribution and supply charges reflecting the particular regime applied to Seeboard. Up until the mid-nineties the real burden of these charges remains relatively static, but then declines sharply as the Regulator toughens his stance and the Fossil Fuel Levy is virtually phased out. In sharp contrast, generation charges first of all rise in real terms, in effect causing the real increase in the Seeboard customer's bill during the first half of the nineties, and then fall much less than the regulated charge – resulting in a sharp increase in the proportion of the price of electricity contributed by generation. If the Regulator performed badly, particularly by getting off to a bad start, the 'market' turns out to have performed worse.

A final step in this analysis, involves making a link between this experience of a typical domestic consumer and that of industrial consumers, in turn explaining why industrial consumers ended up with the better deal.

Table 5: Regional Electricity Company Purchase Costs 1996/7

	Average Price (Pence/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: OFFER (1997)

In 1996 the Regulator published analysis showing that, in 1995, captive consumers were charged about 13% more for generation than non-captive consumers were. Table 5 shows that by 1996/97 this gap had grown to 28%. In other words the RECs systematically allocated their most expensive power purchases to captive customers. Incidentally, the Table also shows how large the differential between contract prices and Pool prices (then about 2.5 pence/KWh) was, dispelling any notion that contract prices reflected Pool prices.

This analysis begs two important questions. Firstly, were the RECs breaking the terms of their licences – which require them not to discriminate between consumers? Secondly, what was the source of the cheap power purchased by the RECs for its non-franchise consumers? Given that National Power and PowerGen had to take large accounting losses on their CCGTs because of the expensive gas contracts (Table 6 below illustrates the extent to which this has been a problem), it seems likely that these fall under 'Other Contracts'. What are left are the nuclear plants, imports and renewables. Nuclear output was about 70TWh and it seems likely that since this was sold at only a small premium over Pool price (less than 5 per cent), this makes up most of the sales to non-franchise consumers. This 'cheap' power has to be seen in the context of massive capital cost write-offs in the nuclear sector and six years of consumer subsidies to Nuclear Electric amounting to about £7bn (Mitchell 1998). Small consumers therefore not only had to pay a subsidy to the nuclear industry via the

Fossil Fuel Levy, but also had to stand by while the resulting ‘cheap’ power was allocated to large consumers.

Table 6: Gas Input Prices for Major Power Producers compared with Large Industrial Consumers

	1993	1994	1995	1996	1997	1998	1999
Major Power Producers	0.706	0.667	0.643	0.628	0.647	0.656	0.613
Large Industrial Consumers	0.713	0.738	0.638	0.433	0.478	0.530	0.513
Major Power Producers as % of Large Industrial Consumers	99	90	101	145	135	124	119

pence per KWh

Source: *Digest of UK Energy Statistics; Energy Trends*

STRUCTURE AND OWNERSHIP

The decade since privatisation has seen the UK’s electricity supply industry undergo extremely rapid changes in the composition of generating capacity, in ownership and in industrial structure. Here we do consider the whole of the UK because of the increasing pace of cross-ownership and integration between England & Wales and Scotland.

The Composition of Generating Capacity

Table 7 shows the dramatic shift in the composition of generating capacity, driven both by the ‘dash for gas’ and by the unanticipated increase in the contribution by nuclear power. That a system previously predominantly driven by coal, should find coal overtaken by gas and almost by nuclear within 10 years clearly represents a dramatic shift. It is perhaps summed up by the fact that the new CCGT stations now generate the same proportion of electricity as conventional steam stations.

However, let us be under no illusions that market signals have driven this change. In the case of the 'dash for gas', three factors have been the most significant. The first two take us back into the previous sections. First of all, in order to encourage competition the RECs were allowed to participate in the risk-free construction of so-called 'Independent Power Projects', underwritten by both the regulatory system (allowing costs which are outside the control of the regulated entity, such as gas input costs, to be passed on) and the captive franchise market. Secondly, there had to be a mechanism which would ensure that these new power stations would be utilised at a level which made them economic. Here the 'Pool' came to the rescue: mercifully free of financial consequences, bids could be designed to achieve desired levels of capacity utilisation rather than to reflect costs. The third factor was environmental controls designed to restrict the emission of acidifying substances. Here National Power and PowerGen would have had to fit Flue Gas Desulphurisation (FGD) to about 12GW of plant if they had wished to continue to operate their coal-fired plant at

Table 7: Fuels Used in Electricity Generation: The UK since Privatisation

Millions of tonnes of oil or oil equivalent

		COAL	OIL	GAS	NUCLEAR	HYDRO	OTHER	TOTAL
1990		49.7	7.9	0.9	14.2	1.6	0.9	74.0
	%	***67.2***	***10.7***	***1.2***	***19.2***	***2.2***	***1.2***	***100.0***
1991		49.4	7.1	1.1	15.2	1.4	1.0	75.1
1992		46.9	8.1	1.5	18.5	0.5	1.1	76.6
1993		39.6	5.8	7.0	21.5	0.4	1.0	75.3
1994		37.1	4.1		21.2	0.4	1.1	73.7
1995		36.1	3.6	12.5	21.4	0.4	1.1	75.2
1996		33.0	3.5	16.4	22.2	0.3	1.2	76.6
1997		28.6	1.9	20.9	23.0	0.4	1.4	76.1
1998		29.0	1.3	21.8	23.3	0.4	1.7	77.5
1999p		25.3	1.2	26.4	22.4	0.4	1.0	76.8
	%	*32.9*	*1.6*	*34.4*	*29.2*	*0.5*	*1.3*	*100.0*

NET ELECTRICITY GENERATED BY TYPE OF FUEL USED IN 1999

	COAL	OIL	GAS	NUCLEAR	HYDRO	OTHER	TOTAL	Conventional Steam	CCGT
TWh	97.35	2.73	125.6	87.67	3.58	0.57	317.51	112.73	112.76
%	*30.7*	*0.9*	*39.6*	*27.6*	*1.1*	*0.2*	*100.0*	*35.5*	*35.5*

Source: *Energy Trends*

the same levels as before. Instead, noting the boom in IPP projects, they chose to fit FGD to 6GW of plant and to join the dash for gas. The shift to gas-fired plant was therefore much more dramatic than it could conceivably have been in a market environment requiring real risk-taking.

The success of Nuclear Electric and Scottish Nuclear (now British Energy) in increasing the proportion of electricity sourced by nuclear power certainly reflected an improvement in the management and performance of nuclear plant, but it too was underwritten, as we have seen, by very substantial subsidy.

At this stage we can close a loop back to the preceding sections. Table 8 shows how successful both nuclear power and the new gas stations have been in taking advantage both of their contrived economics and of the Pooling arrangements: both have achieved high and rising levels of capacity utilisation. Coal, on the other hand, has seen low and falling levels of capacity utilisation which must in turn have significantly impinged on its costs and therefore on its ability to compete: the creation of 'uneven playing fields' has been self-reinforcing.

Table 8: Plant Loads of Major Power Producers

percentages

	94/95	95/96	1996	1997	1998	1999
Conventional Steam Stations	48.5	47.4	45.6	38.4	40.2	36.5
Combined Cycle Gas Turbine Stations	63.5	71.2	70.6	81.4	78.8	83.6
Nuclear Stations	72.6	73.7	76.1	78.9	80.4	77.2

Source: *Digest of UK Energy Statistics*

Ownership and Structure

With assistance of some carrot and stick from the government (required plant divestitures by incumbents in return for freedom to vertically integrate into distribution and supply), the structure of ownership in generation has been transformed compared with the structure dominated by National Power and PowerGen which was created at the time of privatisation. In particular, the demise of National Power as a generator has been spectacular and, somewhat ironically and unexpectedly, the former nuclear generators have acquired pole position in terms of capacity (Table 9).

Table 9: The Ownership Structure of Generation
(% of operating plant, end 1999)

British Energy	15.4
PowerGen	14.2
National Power	11.3
TXU Europe Power (selling to EdF?)	7.8
Edison Mission Energy (for sale?)	7.3
AES	6.4
Scottish Power	6.1
Scottish & Southern Energy	4.2
BNFL	4.2
Electricite de France (EdF-Interconnector)	2.7

Source: compiled by the author from the UK Electricity Association's data on individual generating plant.

This apparent dilution of the power of individual generators is supposed to be the harbinger of greater competition, particularly given that the large part of the market given over to sheltered coal contracts came to an end in 1998. However, such a prospect faces a number of countervailing tendencies including changes in the ownership structure of distribution and supply (marketing), the introduction of the New Electricity Trading Arrangements and the fact that subsidy to the UK coal industry is once again on the table.

The changes in the ownership of distribution and supply (marketing), which we also view as revolutionary, are shown in Table 10 (given the almost breathless pace of the changes in ownership and names, it cannot guarantee that this table is quite up to date). First of all, this relates the scale of the foreign takeover of the industry: out of the 22 corporate entities identified in the table, less than half remain in the hands of UK companies. Secondly, the cells with a solid black background identify those companies which are generators, as well as owning distribution or supply (marketing) companies or both (where there has been a formal split between distribution and supply this has been indicated as such). In other words, there is now a very strong trend towards vertical integration as two thirds of the distribution or supply companies are now owned by generators. We shall explore the implications of this in the next section.

Competition from non-incumbents is limited to 13 supply/marketing companies (Aquila Energy Supplies, Atlantic Electric and Gas, Bizzenergy Ltd, British Gas Trading, Enron Direct Ltd, Maverick Energy Ltd, Shell Power Ltd, Economy Power Ltd, Ecotricity, Electricity Direct (UK), Pentex Oil & Gas Ltd, Electricity plc and Utility Link Ltd) and just 4 of these supply domestic customers (Atlantic Electric and Gas, British Gas Trading, Enron Direct Ltd and Utility Link Ltd) (OFGEM 2001). Moreover, it is interesting but not surprising to note that British Gas Trading (Centrica plc), the incumbent supplier in the gas market, has become the largest single supplier of electricity (Financial Times 28/2/2001).

Table 10: Changes in the Ownership of Incumbents: Transmission, Distribution and Supply/Marketing

Original Company	Current Name	Current Owner	Nationality
East Midlands Electricity	East Midlands Electricity	**EON: PowerGen**	Germany
Eastern Electricity	24seven (distribution)	**Electricite de France (EdF): LE Group/TXU Europe**	USA/France
	Eastern Energy (marketing)	**TXU Europe**	USA
London Electricity	24seven (distribution)	**Electricite de France (EdF): LE Group/TXU Europe**	USA/France
	London Electricity (marketing)	**Electricite de France (EdF): LE Group**	France
Manweb	Manweb	**ScottishPower** (merged with Pacificorp)	UK
Midlands Electricity	GPU Power UK (distribution)	General Public Utilities (merging with FirstEnergy)	USA
	npower (marketing)	**Innogy Holdings**	UK
Northern Electric	Northern Electric & Gas	MidAmerican Energy Holdings	USA
NORWEB	NORWEB	United Utilities(merger with North West Water)	UK
	NORWEB ENERGI	**TXU Europe**	USA
SEEBOARD	SEEBOARD	American Electric Power	USA
Southern Electric	Scottish & Southern Energy	**Scottish & Southern Energy** (merger of Scottish Hydro-Electric and Southern Electric)	UK
SWALEC	Western Power Distribution (distribution)	PP&L Resources/Southern Company	USA
	SWALEC (marketing)	**Scottish & Southern Energy**	UK
SWEB	Western Power Distribution (distribution)	PP&L Resources/Southern Company	USA
	SWEB (marketing)	**Electricite de France (EdF): LE Group: London Electricity**	France
Yorkshire Electricity	Yorkshire Power	**Innogy Holdings/Xcel Energy**	UK/USA
South of Scotland Electricity Board	ScottishPower	**ScottishPower** (merged with Pacificorp)	UK
North of Scotland Hydro-Electric Board	Scottish & Southern Energy	**Scottish & Southern Energy**	UK
Northern Ireland Electricity	Northern Ireland Electricity	Viridian Group plc	UK
National Grid	National Grid	National Grid	UK

Source: compiled by the author from company and UK Electricity Association sources

CONCLUSIONS

Two general conclusions may initially be drawn from the foregoing. The first is that appearances, and the rhetoric which have accompanied them, have been deceptive: the UK's privatised electricity supply industry has never been what, to some observers, it might have seemed to be. Indeed, discovering what has been happening has been like taking apart a Russian doll, with each layer adding to understanding and at the same time dispensing with particular illusions. Moreover, each layer affects every other, and apparently unrelated developments turn out to be related in ways that are not easily perceived. The second general conclusion is that the behaviour of the UK's electricity supply industry over the last decade has had very little to do with the market and competition, such that even using the term 'liberalisation' can reasonably be declared to be a misnomer. In particular, the 'Pool' was neither a market nor transparent and it was regulatory intervention and public subsidy which eventually delivered some relief for, respectively, domestic consumers and industrial consumers.

Beyond these general conclusions it is important to explore why the outcome has not matched the rhetoric. Here three different sets of factors have come into play. Firstly, it is inevitable that, at the outset, the inherited structure and condition of the industry will leave its mark. While some economists may view competition in very abstract and other-worldly terms, the reality has been that such a network industry cannot actually be broken up in a way which creates a competitive environment. There are those who saw the solution in more fragmentation: the initial creation of a larger number of competitive generation companies. But how could a competitive 'level playing field' have been achieved given the inherited composition and distribution of plant and customers? And could competition have taken place, implying as it does that these generators would compete for each others' customers, without one or more of them acquiring the capacity to compete by immediately becoming much larger than the others?

Reinforcing these inherited and conceptual difficulties was then the expediency of a government more concerned with selling the industry than with liberalisation *per se*.

Secondly, there are the problems associated with nature of electricity as a commodity. Going back to first principles, the purpose of liberalisation is increased competition driven by increased choice. However, increased choice exercised by generators, traders and consumers also brings with it increased *uncertainty*. And an increase in uncertainty is the last thing which is required for the safe, reliable and economic delivery of electricity. In particular, the fact that electricity cannot be stocked removes the all important buffer against the consequences of uncertainty. A second problem is that, at least for retail consumers, electricity is an essential but essentially boring commodity. It is boring because it is homogeneous. Thus, while consumers may be willing to travel miles and spend days pursuing their preferences for clothing or cars, these same retail consumers are likely to be less enchanted by the prospect of exercising their discretion to choose an alternative electricity supplier and then, to keep the market on its toes, another and another and another. The first of these problems gives generators and suppliers (marketers) a strong incentive to adopt a corporate strategy which reduces uncertainty, while the second allows them (as long as the regulator shows the required understanding) to achieve this by seeking refuge in anti-competitive industrial structures. The very powerful trend towards vertical integration between generators and suppliers, as generators seek to harness captive retail customers, bears ample witness to this. Specific affirmation comes from Mr Brian Count, Chief Operating Officer of Innogy, following Innogy's acquisition of a 94.75% stake in Yorkshire Electricity in February of this year: A particular advantage of the acquisition, he said, was that the resulting "balance between generation and retail supply contracts also places us in a strong position to hedge against volatile electricity prices." (Financial Times 28/2/2001).[1]

[1] It may seem that British Energy's decision to sell SWALEC, its electricity supply business, contradicts this view of strategy. However, a glance at the small print of the deal reveals that , as well as agreeing to buy SWALEC, Scottish & Southern also agreed to buy more electricity from British Energy over a five-year period than SWALEC would have done (Financial Times 8/8/2000). In other words, in this particular instance, British Energy managed to 'have its cake and eat it'.

The third factor contributing to an explanation of the way the UK has experienced electricity liberalisation is simply that the requirement to create value for shareholders reinforced these tendencies: shareholder value is more likely to be enhanced in a less competitive environment. As well as presenting problems for the physical management of electricity supply, too much choice and competition can be harmful to profitability.

Finally, having reached this point, a perspective on NETA, the 'New Electricity Trading Arrangements which are being introduced as I write, is possible. NETA essentially brings physical together with financial trading in a confidential contract market which will cover the majority of the electricity bought and sold. In other words, the centrepiece of the new system recognises the reality of the previous situation in which participants sought to avoid exposure to the 'Pool' by using 'Contracts for Differences'. In place of the Pool is a mechanism for dealing with last-minute system imbalances – the 'Balancing Mechanism' designed to address net imbalances in supply and demand by inviting offers and bids from both generators and suppliers, resulting in prices which are an *ex post* weighted average of offers and bids. There are different (dual) cash-out prices for generators and suppliers to prevent all volumes being treated as imbalances with Contracts for Differences around the imbalance price.

In the context of this paper, two observations may be made about these new arrangements, both of which imply that the UK electricity market may well now become less rather than more 'liberal'. First of all, the dominance of the long-term contract market, while it clearly does recognise the reality of the requirements for the reliable physical management of electricity supply, also underwrites the 'comfort zone' which generators have created for themselves by vertically integrating into supply: they will be able to sell to themselves in confidence. Secondly, the 'Balancing Mechanism' seems likely to be volatile, with too much exposure to it implying considerable and difficult-to-manage risk. It therefore also seems likely that generators and suppliers will seek to avoid any competitive adventures which run the risk of being caught with uncovered positions. A tacit agreement to be conservative may turn out to be a mutually beneficial strategy.

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