

Electricity: Regulatory Developments Around the World

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The Beesley Lectures on Regulation Series XI

**IEA/LBS, London 9 October 2001
(Revised version 12 November 2001)**

I was pleased to be invited to give this lecture. It was only when I came to write it that I realised how mad I had been to suggest this title. Privatisation, liberalisation and regulation of the electricity industry are now such widespread phenomena. It is of course totally impracticable to try to give an account of developments around the world that is comprehensive, accurate and up-to-date.

What I have done, therefore, is to focus on a few common themes. I shall explore some issues that are presently stimulating debate or causing concern in a number of countries, not least the UK. Not surprisingly, the themes are familiar: the nature of regulation, competition in generation and retail supply, and wholesale trading arrangements and Pools.

With some regret, since this is presently an active topic in the UK, time precludes discussing regulation of the monopoly networks. Briefly, some other countries like Australia, Norway and Holland have been following a similar policy to the UK, but other countries like the US and New Zealand have done relatively little in this area. Developments in the competitive markets overseas rather than in network regulation are probably of most interest at present.

Overall trends

Before we get to the detail, are there any worldwide trends in electricity regulation? Over the last decade or so, variants of what might be called the “standard model” have gradually been implemented around the world. This standard model includes a separate transmission company, privately owned and competing generation companies bidding into a Pool, all or part of the retail market open to competition, privately owned transmission and distribution networks with third party access on published and non-discriminatory terms, and an independent regulatory body. This type of model has been implemented in developing as well as developed countries. Not all the components are

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always there in full. For example, two countries have sought to avoid regulation, while in other countries regulation has arrived before there is much to regulate.

My impression is that there have been two broad streams of thought and activity over the last couple of years. The first has been to extend, implement and refine the standard model. For example, the model is under active consideration in several countries at present, including Mexico, the Philippines, India and Thailand. The international development banks are considering how to apply the model in very small countries – for example, with a total generation requirement of about 1000MW or even less - where extensive competition might seem impracticable.

Some countries that have already implemented elements of the standard model are implementing or strengthening other elements of it – for example, dominant incumbent generators are being required to divest, retail competition is being extended, the scope of regulatory authority is being clarified, and so on. There are several examples of this in the European Community, following the policy suggested by the European Commission itself, though that policy is silent on ownership and restructuring.

Finally, those countries that were first to implement the standard model are now refining their arrangements in the light of considerable experience, to make the competitive market as effective as possible. Examples here would be Australia, particularly at the national level, the eastern jurisdictions in the United States, and of course England and Wales.

But in parallel with these developments, there has also been a reaction against the concept of privatisation and competition in the electricity sector. California is the standard example cited as the justification for this stance, though this may often be just a convenient peg on which to hang an argument. And not really a convincing one, since privatisation was never an issue in California, and the difficulties experienced arguably reflected regulatory limitations on the competitive market rather than limitations of competition per se. Nevertheless, in some countries this attitude has stopped privatisation and competition, in others it has delayed it.

In some countries that have implemented some variant of the standard model – Australia, New Zealand, California and the UK, for example - there is much soul-searching and questioning of the benefits of privatisation and competition. There are numerous official and unofficial reviews of the regulatory framework. The decisions of the companies, the competitive market, the regulator and indeed the customers are all under scrutiny. There are proposals to supplement, influence or replace these decisions by the decisions of government. In many ways this is a pity, and likely to be counterproductive. One of the aims of the original policy was to get the government out of the market, precisely because of the problems caused by its involvement in that sphere.

But the concerns about the competitive market need to be assuaged. Rather than addressing this issue directly, for the most part I shall concentrate here on what might be called the refinements to the competitive market approach. This is not because the other

issues are unimportant – quite the contrary – but because the most effective way to assess and justify the competitive market approach is to make it work as well as possible. If we can debate and clarify our ideas and policies in that area, that will facilitate the implementation of sensible policies elsewhere.

The Nature of Regulation

If we ask, “is electricity regulation really needed?” most would answer, “Yes of course”. This was not always the case. Around the middle of last century, several respected economists challenged the need for regulation of monopolies, on the grounds that it might put unnecessary obstacles in the way of innovation and competition².

My answer to those concerned about this aspect of regulation is threefold. First, their suggested alternative of an unregulated private monopoly is typically not available. It is generally not politically possible to introduce competition and private ownership without regulation. Second, the modern regulatory framework typically gives the utility regulator a duty to promote competition and encourage new entry, in contrast to traditional regulatory frameworks that sought to replace competition. Third, where competition is not feasible, incentive regulation rather than traditional cost of service regulation has sought to promote the kinds of efficiency improvements associated with competitive markets.

Nowadays, there is concern about the extent and cost of regulation rather than the principle³. One issue is whether a sector regulator able to act ex ante is preferable to reliance on a competition authority acting ex post. In March of this year the European Commission proposed a Directive declaring that “independent national regulation is pivotal”. It said that such regulation should secure non-discriminatory access to transmission and distribution networks, fix or approve the network tariffs, act ex ante rather than ex post, facilitate cross border trade, and generally bring continuity and transparency to the market.

Two countries have resisted this approach: Germany and New Zealand. Both countries set their faces against it as a result of unfortunate previous experiences with regulation. But what of their more recent experiences of not having an ex ante sector regulator?

Germany

Private ownership and competition are not at issue in Germany. Indeed, in 1998 Germany suddenly declared that all customers could choose their retail supplier, effective immediately. Retail competition has already led to significant price reductions to some

² For a review of these concerns see my Wincott Lecture, published as Privatisation, Competition and Regulation, Occasional Paper 110, Institute of Economic Affairs, London, February 2000.

³ E.g. John Blundell and Colin Robinson, Regulation Without the State ... The Debate Continues, Institute of Economic Affairs, Readings 52, London, September 2000. Better Regulation Task Force, Economic Regulators, London, July 2001.

large industrial customers, who previously had been paying high prices, in part because of the high costs of the domestic coal industry.

However, a problem has now arisen as competing suppliers have tried to access smaller industrial, commercial and residential customers. There are no published non-discriminatory terms of access to the networks. Each potential third-party user has to negotiate these with each incumbent network operator. There have been increasing concerns that the vertically integrated incumbents are charging excessive prices and delaying access so as to increase their own profits and protect their own retail supply businesses. It is feared that the utilities are cross-subsidising their larger industrial customers, and facilitating the expansion of their own businesses elsewhere in the world.

Whether or not these accusations are true is unclear, but they are widely believed. Quite apart from the precise level of the charges, the unbundling and lack of transparency are increasingly problematic. But there is no sector regulator to deal with these problems *ex ante*. In principle complainants may take their case to the competition authorities. The Federal Cartel Office (Bundeskartellamt) is said to be sympathetic, but to have too few resources to deal with too many complaints. The state-based structure is not conducive to one decision setting a precedent for others. Decisions by the competition authorities can be appealed, and may take several years to implement.

A couple of weeks ago the Federal Cartel Office announced that it was investigating the network charges⁴. Significant differences between network operators suggested that some companies were abusing their monopoly position to charge discriminatory prices. The Office was also looking at whether some network operators cross-subsidize other parts of their business. In some cases, vertically integrated grid operators have set end-user prices below the tariffs charged for third party network access. What this investigation will find, and how soon, and what it will do to remedy the situation, all remain to be seen.⁵

New Zealand

The electricity industry in New Zealand was liberalised but only partially privatised in several steps over the period since 1994, without the creation of a regulator other than the Commerce Commission. I happened to arrive there one day in 1999 when several of the companies put up their prices significantly, and the then-Minister immediately announced that he would have to consider regulation. There was a general election soon after, and the incoming Minister launched an Inquiry in February 2000 as to whether the current regulatory arrangements were best suited to achieving the government's objective of (in brief) efficiently delivering electricity to all consumers.

⁴ European Power Focus Weekly, Issue 16, 28 September 2001.

⁵ But there has been a further development. . "After the recent announcement of the Federal Cartel Office to scrutinize the grid tariffs of 22 network operators, the cartel office in the state of Baden-Wurttemberg has now also launched an investigation into the grid charges of 86 local and regional network operators." Powerfocus Europe, 12 Oct 2001.

The Inquiry reported in June 2000⁶. It recommended no less than four different kinds of regulation: multilateral industry agreements subject to endorsement by the Government, the influence of ownership by public bodies, comparative competition by peer pressure and public opinion based on performance indicators, and targeted price control via the Commerce Act. But not a traditional sector regulator.

In December 2000 the Government confirmed that it wanted an Electricity Governance Board to consolidate, replace and extend the powers of three existing industry boards. Amongst other things this new Board would be responsible for

- developing the rules of the wholesale markets
- transmission pricing methodology and security standards
- system expansion and replacement
- terms and conditions for connection of distributed generation to the distribution systems
- retail switching and customer complaint procedures
- dispute resolution procedures
- model arrangements for use of system charges and distribution pricing
- model arrangements for domestic customer contracts.

The Board would be required to ensure that rules were developed consistent with Guiding Principles laid down by the Government. The Board was to have a majority of independent members, who would be appointed after consultation with the Minister of Energy. Their prime obligation should be to develop and enforce rules consistent with the Government's Guiding Principles. The industry was invited to move quickly to set up this Board, and to report on progress by 28 February 2001. If there was insufficient progress the Government would regulate to establish the Board.

As regards the monopoly networks, the Government said that its policy objectives would be embodied in the statement of corporate intent of the publicly-owned transmission company Transpower. The Government expected the distribution companies, the majority of which were owned by trusts, to keep changes to their rural line charges in line with their urban line charges. In addition, they would have to set at least one tariff to domestic customers with a fixed charge less than 10 per cent of the average bill. This tariff would have to give the same total bill as at present at the average level of usage, so as to benefit those using small amounts of electricity.⁷

If this is New Zealand's idea of avoiding government regulation, some might wonder what the solution would have been like if it did wish to use this approach. More seriously, it seems that the now-standard job of the sector regulator is being split between an all-singing all-dancing Governance Board, which also carries out the function of a market

⁶ Inquiry into the Electricity Industry, Report to the Minister of Energy, June 2000. I acted as adviser to the Inquiry, but was not a member of the panel.

⁷ The Commerce Commission is required to publish thresholds and to investigate lines businesses (both distribution and transmission) that breach those thresholds for the purposes of price control. There is a legislative requirement for ownership separation between energy businesses (retail and generation) and lines businesses.

operator, and the Government itself. It remains to be seen whether this allocation of governance responsibilities is as responsive to change and to problems, and as able to implement necessary modifications in a timely way, as a typical sector regulator, imperfect though the latter may be. It is also unclear what effect such explicit involvement of the Government will have. In general, experience with industry boards and government stewardship is not particularly encouraging when it comes to regulatory matters⁸.

The timetable for forming the new Governance Board already seems to have been put back somewhat. The chairman of the Inquiry panel was appointed to chair a process to set up the Board. On 7 September of this year he noted that several market participants were not minded to sign unless their concerns about generator market power and vertical integration were addressed, but that these were beyond the scope of the Board. He envisaged that the Board could come into effect in 2002.

Meanwhile the New Zealand Government has announced another review of the industry. During early 2001 there was a period of low rainfall, shortage of water for hydro-electricity, high electricity prices, and customer complaints. A large retail supplier had to exit from the market with large losses, having been unable to purchase electricity within the price at which it had sold. The Government announced in September that it was reviewing the events of the year⁹. Both these are of course matters that would normally fall to a sector regulator to deal with.

Conclusion on regulation

I have no desire to introduce or perpetuate sector-specific utility regulation where it is unnecessary, and I am sympathetic to proposals to transfer the regulation of competitive parts of the industry to the competition authorities. However, the countries where sector-specific regulation has so far been resisted do not present appealing pictures of more efficient and innovative electricity sectors that are more responsive to the need to change. Nor are they independent of the Government. If anything the opposite. There is a question whether independent sector-specific regulation can be more actively reduced as competition develops, but these examples do not suggest that it should be eliminated altogether.

Competition in Generation: Initial Restructuring

How important is it to restructure the generation sector of an industry? When the Government privatised the electricity industry in England and Wales, it initially planned to create just two successor companies to the Central Electricity Generating Board (CEGB). One company (Big G) would provide nearly two thirds of the output, including

⁸ Government or non-profit ownership of transmission and distribution also restricts the scope for specialisation and incentives to increased efficiency. Cf. Paul L Joskow, Regional Transmission Organisations: Don't Settle for Nth Best ($N \gg 1$), Presentation to Harvard Electricity Policy Group, 21 September 2001.

⁹ Government Policy and Statement: Further Development of New Zealand's Electricity Industry, Hon. Pete Hodgson, Minister of Energy, September 2001.

all the nuclear, the other (Little G) would provide nearly the other third. In the event, the nuclear stations were deemed not saleable at the time. National Power ended up with just under half the total output, PowerGen thirty percent, and Nuclear Electric 15 per cent. So the largest two companies had nearly 80 per cent and the largest three had 94 per cent. Interconnectors and others provided the remaining 6 per cent. By today's standards, the degree of concentration of output in two or three incumbent companies would be unacceptable.

The implicit assumption was that customers would be protected by the ability of other generators to enter the market and construct new plant if these three incumbents were able and willing to exercise market power. In the event, entry took place on a larger scale than anyone had foreseen. Nevertheless, this was not sufficient to prevent the incumbents from increasing prices above the new entry level. As regulator, I had to take steps to require the two largest incumbents to divest some price-setting mid-merit plant to a new competitor. Since then there has been further divestment, partly in the context of merger clearance and partly on a more voluntary basis. Now, the largest company, which is neither of the two former duopolists, has less than 20 per cent of total output. PowerGen and the successor to National Power each have less than 10 per cent. It is now generally agreed that three successor companies were by no means enough.

New Zealand had a similar problem. When it originally separated off transmission as Transpower in 1994 it left Electricity Corporation of New Zealand (ECNZ) as a single successor generator. It assumed that new entry would suffice to protect customers. But this was untenable. In 1996 it had to split off Contact Energy, which was privatised, and in 1999 it split the remainder of ECNZ into three state-owned enterprises¹⁰.

This is not to argue that the number of competitors is the only criterion for a competitive market, and that conditions of entry are of no importance. On the contrary. Michael Beesley always used to argue that, however many competitors there were in a market, they would seek to exercise market power unless others could enter the market and upset their plans. Events in California have demonstrated the terrible consequences of preventing or delaying new entry. Initially there were higher prices, later there was inadequate capacity to meet demand.

The number of competitors and the ease of entry are more closely related than is generally appreciated. Building new plant is one way of entering the market, but it is time consuming and expensive. Another way is to buy an existing plant, or even an existing company. Sites alone have value, even if the plant is worn out, by virtue of their planning permission and existing grid connection. All these means of entry are normally available in competitive markets for other products, but until recently they were not available in the electricity markets of most countries in the world. Opening the market with only one or a

¹⁰ It is fair to acknowledge that New Zealand has a smaller population than most of the other countries considered here. This may influence the feasible depth of competition in generation, though it may also suggest the importance of securing whatever competition is possible. It should not affect the points made about regulation, except to the extent that in a smaller country informal contacts and pressures may be more significant.

few successor companies therefore restricts the options available to entrants, and thereby deters entry. This is particularly the case if some of the companies are not for sale because they are government owned.

Now, however, generating plants, sites and companies are increasingly freely bought and sold, at least in England and Wales and to some extent in Europe, Australia and the USA. The ability of potential competitors to enter the market quickly, at whatever scale suits them, will enhance competition. So too will the ability of existing players to exit the market equally quickly if they feel they are not as well placed as others to compete.

The need for an adequate number of competitors in the market is increasingly appreciated. Argentina even sold each generating station separately, and as far as I know has not regretted this. Scandinavia and most of the US and Australian states that have embraced competition have a significant number of competitors, in some cases as a result of divestiture. Spain and Italy are presently requiring their incumbent utilities to divest some plant, though they will need to go further to achieve an adequate degree of competition in the market.

Some countries and companies have resisted. Electricite de France has offered to sell some output to competitors, but not some plants. France has created a regulator, but it stands out as the country that has refused to take the necessary steps to create a competitive generation market, and a fully competitive retail market is not possible without adequate competition in generation. Germany has precluded a fully competitive retail market by a different route, as explained earlier. It is unfortunate that two of the leading countries in Europe have so far set the worst examples in terms of liberalising the electricity market.

Competition in Generation: Conduct and Structure

Despite restructuring and new entry, actual or potential generator market power remains an issue that concerns market participants, customers and regulators in many countries. How significant is it, and what steps should be taken to deal with it?

I leave aside discussion of the Market Abuse Licence Condition (MALC), where the DTI's present consultation nears a conclusion. But there are similar concerns elsewhere. In Australia the National Electricity Code Administrator (NECA) recently issued draft guidelines to prevent the withholding of capacity artificially to increase prices, the exploiting of network constraints, and the practice of rebidding following reductions in transmission capacity¹¹. The statement explicitly made reference to the MALC in the UK.

In the US, market monitoring has become standard practice. Events in California have put this issue at centre stage. There were undoubtedly very high generation prices there at

¹¹ NECA 12 September 2001. An earlier statement (24 May) proposed to consider limiting the increase in prices from one 5 minute period to the next to A\$500. It would then take about an hour for prices to reach the then-current generation cap. NECA said this would remove specious and unwarranted short-term price spikes while retaining genuine market signals about supply and demand.

some times over the last two years. But how far were these the natural result of increased costs and market-clearing prices in a situation where demand had outstripped capacity, and how far the result of generators exploiting market power?

It has been fascinating to follow the debate between some of the leading energy economists in the US. Joskow and Kahn¹² have argued that there is evidence of withholding behaviour by generators in California, and that “about a third of wholesale price can be attributed to market power during June, July, August and September 2000, after accounting for changes in fundamental supply and demand conditions.” Harvey and Hogan¹³ have challenged this, suggesting that market structure inefficiencies and resulting uncertainties could explain this behaviour.

In terms of economic and engineering expertise, and use of empirical evidence, it would be difficult to match the quality of these analyses. Perhaps Joskow and Kahn have the edge at present, so that on the balance of the evidence the generators may have restricted output in order to raise prices in the market. However, my concern here is not to pass judgement on that issue, but to examine what the implications are for policy. Are we to conclude that regulators should carry out studies of this kind when market abuse is suspected, and on the basis of those studies should penalise the offenders in some way, for example by fines?

There are at least two difficulties with such an approach. First, despite the enormous and focused intellectual input over nearly a year, I am not sure that the incidents in California have been conclusively resolved. Contrast the situation of the average regulatory office, with the average amount of expertise and time and resources at its disposal, subject to the pressure of other regulatory business, and faced by well-resourced experts acting on behalf of the parties whose conduct is at stake. Is it realistic to expect that such an office could discover, analyse and resolve any such controversial issue within a reasonable time, to the satisfaction of whatever court might ultimately be called upon to adjudicate?

It might be counter-argued that, although the techniques, arguments and evidence deployed by the economists I have cited were in this case relatively novel, once this immediate issue has been resolved it would be relatively straightforward for a regulatory office to identify and analyse the evidence in a future instance. However, such a response would underestimate the variety of circumstances likely to arise in practice, and the ability of interested parties to find ways around any specified set of criteria.

The second difficulty has to do with the economic analysis of competition. Given that a particular type of conduct has been identified, how are we to interpret and treat it? Underlying the analyses just referred to, and many more, is the proposition that in a

¹² Paul L Joskow and Edward Kahn, “A Quantitative Analysis of Pricing Behaviour in California’s Wholesale Electricity Market During Summer 2000”, NBER Working Paper 8157, March 2001 and “Identifying the Exercise of Market Power: Refining the Estimates”, July 5, 2001. Paul L Joskow, “California’s Electricity Crisis”, Working Paper 8442, National Bureau of Economic Research, August 2001, © P L Joskow, quotation from p. 32.

¹³ S Harvey and W Hogan, “On the exercise of market power through strategic withholding in California”, April 2001.

competitive market, price should equal marginal cost. If price is systematically above marginal cost this indicates market power¹⁴. The most familiar derivation of the optimality of marginal cost pricing is within the models of theoretical welfare economics, in which the market and all firms within it are assumed to be in equilibrium. Typically there is perfect knowledge, and the firms have made optimal decisions about technology, scale of output, and so on.

It is fair to say that no one assumes that this is really the world we live in, and the authors cited do not assume that. It is surely more realistic to assume that we live in a world of constant and more or less unexpected change. Neither the generation market nor any other is ever actually in equilibrium. Certainly there may be equilibrating tendencies – an increase in price will stimulate existing generators to try to produce more, and (depending on their estimates of future prices) generators will be more inclined to enter the market, including by building plant. But equally there are disequilibrating tendencies – an explosion at a plant, unexpected movements in gas prices, levels of rainfall affecting hydro capacity, changes in the growth of consumer demand, events in the macro-economy (no small factor after September 11) and not least intervention and changes in policy by regulatory and government authorities.

In such a world, it would be commercial suicide for a generator to assume that the market will always be in equilibrium and that it should price at marginal cost. The world is too risky for that. Investment in new plant is very expensive and typically takes a long time to recover. The entrant must reduce its risks and plan to get its investment back as soon as possible. It will do this by a variety of long term and short term contracts to allocate risk to those parties best able to control them – which will typically include fuel suppliers and equipment manufacturers as well as retailers and customers. In the absence of regulatory or other constraints, there is a continual process of trading and re-trading such contracts in the face of ever-changing market conditions. The bid that a generator makes in the spot market, if indeed it chooses or is forced to be in the spot market, is thus just a small part of its whole strategy for coping with the substantial risks of a generation business.

This is not to argue that the generation market is different from other markets. I am arguing that, in the real world, competitive markets generally are not characterised by price equal to marginal cost. That is the wrong benchmark for judging possibly anti-competitive behaviour. Life is more complex and in particular more risky than the marginal cost criterion recognises. In a competitive market each participant will seek to reduce its risks and cover its investment whenever and wherever it can. It cannot price at any time on the basis that each of its assets will earn an equilibrium return for the rest of its life.

¹⁴ For example, “The more the observed price exceeds the competitive benchmark price, the more one can presume that either market power was being exercised or some other source of market imperfection has interfered with the competitive interplay of supply and demand. The competitive benchmark that we utilize is the short run marginal cost of supplying electricity from the last unit that clears the market in each hour. Comparing realized prices with marginal supply costs in this way is a widely accepted method for measuring the presence of market power.” Joskow and Kahn, 15 January 2001, p. 9 (earlier version of their March 2001 paper).

What does this more Schumpeterian approach imply for regulatory policy? A need to consider the long-run as well as the short-run consequences of any policy. If there is a substantial penalty for alleged withholding of output, an existing generator may well be more inclined not to do this. But a potential new generator might also be less inclined to enter the market. Ameliorating today's problem may thus be at the expense of exacerbating tomorrow's.

This is obviously not an easy balance to strike. Given the difficulties of satisfactorily defining and proving anti-competitive conduct, my own inclination would be to focus where possible on structure and incentives when designing remedies, rather than on conduct. Protection for customers can be provided in a number of ways. These include promoting new entry, and enforcing divestment where necessary and practicable, taking into account local as well as market-wide monopoly positions. Wholesale trading should allow suppliers to contract ahead rather than force them to trade only in the spot market. Retail competition should give suppliers incentive to protect themselves and customers. The system operator should have flexibility to contract ahead so as to avoid or minimise market power, and there should be incentives to remove network bottlenecks where it is economic to do so¹⁵.

These are almost the opposite of the policies followed in California. As I indicate later, regulatory restrictions there left utilities and customers needlessly exposed to generator market power. But the experience of California should not be typical

Competition in retail supply

Allowing competitive suppliers access to the wires of the local distribution companies, and thereby allowing all customers a choice of supplier, was one of the more innovative aspects of the privatisation in England and Wales. My own thinking was that it would provide more effective protection for customers, and a more efficient and innovative market, than regulation of monopoly distribution companies. Introduction of retail competition had to be phased in over eight years in order to provide transitional protection to the coal industry. But no one knew whether the concept would succeed.

In the event, it has done so. Over 80 per cent of large customer demand is now met by so-called second tier suppliers rather than the local utility, and over two-thirds of medium-sized customer demand. In the less than three years since the residential market has been open, about 27 per cent of such customers have moved to a second tier supplier, and present rate of change is about 100,000 customers per week¹⁶.

Other countries have opened the market for larger customers. A smaller but increasing number is opening the market to residential customers. The take-up here is more mixed,

¹⁵ In Australia, and potentially in the US and elsewhere, there are now entrepreneurial interconnectors that should help to reduce market power.

¹⁶ About a quarter of those seem to be moving back to the first tier supplier, so the net movement away from first tier suppliers may be nearer 50,000 a week. Even so, over the course of a year that represents about 10 per cent of residential customers.

and the data less up to date. In Norway, the number of households that had switched to another supplier rose steadily to 7 per cent by the end of 1999¹⁷. At the same rate of increase the proportion might be nearly double that by now. In New Zealand some 5 per cent of residential customers had switched within a year of the market opening in 1999¹⁸. It has been suggested to me that this proportion may have increased to between 20 and 25 per cent by last year, but with the problems of higher generation prices in New Zealand the proportion switching back to incumbent suppliers may also have increased. One of the largest retail suppliers recently pulled out of the market having made serious losses¹⁹.

In the US the situation is mixed and reportedly volatile. One report with figures for the end of 1999 and early 2000 shows between 1 ½ and 17 ½ per cent of residential customers switching in five different companies in Pennsylvania, 2 per cent in California and under 1 per cent in Massachusetts.²⁰ In California and perhaps elsewhere the proportion subsequently declined as generation prices rose or fluctuated²¹. Few retailers entered the market, and many have now left the market.

Looking forward, Holland is scheduled to open its residential market in 2004. Texas has just begun the pilot stage with a view to full opening next year. Victoria is scheduled to open its market in January 2002 (deferred from January 2001). The European Council recently recommended that all member states open their markets completely by 2005.

There have been some backward steps, however. France vetoed the EC recommendation in March. And very recently, the State Government of California proposed to repeal retail competition²².

Here, I want to look at four topics: the doubts that some economists have expressed as to whether retail competition is worthwhile, the policy of direct wholesale access in California, the subsequent suppression of retail competition in California, and the alternative policy of transitional price caps adopted in Britain and elsewhere.

¹⁷ NVE 2000.

¹⁸ Inquiry Report 2000.

¹⁹ A colleague writes “customer confidence in changing supplier was hit hard as the retailers struggled to produce bills and manage customer data bases. A big lesson from the NZ experience is that data management is the most important feature of retail markets and must be in place before the market is opened.” (Bill Heaps, personal communication, 3 October 2001). This provides some justification for the thorough but time-consuming procedures adopted in the UK and probably in Australia, but I suspect not in all countries.

²⁰ Paul L Joskow, Why do we need electricity retailers? Or, can you get it cheaper wholesale?, Center for Energy and Environment al Policy Research, Massachusetts Institute of Technology, revised discussion draft, 13 January 2000. The proportion switching seems to depend on the level of so-called “shopping credits” represented by the discount on the incumbent utility’s bill for moving to another supplier. There have been considerable concerns about cross-subsidy. My view is that the UK approach is preferable, not least because of the more explicit calculation and charging of network costs here, without using the incumbent supplier’s costs as the basis for granting credits to competing suppliers.

²¹ The proportion of California’s residential customers taking another supplier was down to 0.6 per cent as of 31 August 2001. CPUC data filed 15 September 2001.

²² Followed by Arkansas, which proposed to delay or repeal retail competition.

Costs and benefits of retail competition

Earlier this year the National Audit Office published an assessment showing that the price reductions to customers who changed supplier outweighed the total costs of implementing retail competition.²³ There have also been a number of innovations such as green electricity, tariffs with no standing charge, the convenience of buying electricity and gas from the same supplier, price reductions for dual fuels and prompt payment, guaranteed fixed charges for the year independent of consumption, and so on.

Gordon MacKerron of NERA challenged the NAO's assessment²⁴. He argued that the benefits of competition were less than they seemed, and that those who did not change supplier were worse off, because they paid the cost without receiving any benefit. Moreover, some of the benefits like prompt payment discounts could have been secured without competition. He suggested that the benefits of full retail competition may have been less than the costs, and that the policy probably made customers worse off. He implied that France might be justified in not opening its market.

I argued²⁵ that his assessment undervalued the contribution of competition to reducing the costs of generation through sharper purchasing by competing retailers, and through the reduction in coal and nuclear costs now that these fuels were no longer protected by a monopoly buyer. There was increased knowledge about distribution costs as a result of the pressures to ensure a competitive and undistorted retail market. There was greater incentive on retailers to discover and provide the kinds of terms that customers wanted. All these factors meant that the benefits of retail competition were greater than the critics allowed. In fact, many of these benefits had already been factored into the tighter transitional price cap that was set when the residential market opened. So measuring the benefits of competition against that price cap was already to undervalue them.

Graham Shuttleworth of NERA reaffirmed Gordon's argument in the phrase "if you can do it under monopoly, it isn't a benefit of competition." He suggested that appropriate action by government and/or regulator could have achieved some of those benefits²⁶.

The extent of this is what I dispute. Austrian and public choice economists have been arguing over the last quarter of a century that Governments and regulators typically do not have either the knowledge or incentive to do all these things. Competition is precisely a way of providing the relevant information and incentivising the market participants to use it to benefit customers. Most economists have now accepted these arguments, at least in principle. Putting the arguments into practice seems to be more difficult.

²³ NAO, Office of Gas and Electricity Markets: Giving Domestic Customers a Choice of Electricity Supplier, Report by the Comptroller and Auditor General, HC 85 Session 2000-01, 5 January 2001.

²⁴ Gordon MacKerron, Costs and Benefits of 100% Electricity Market Opening, NERA Energy Regulation Brief, April 2001.

²⁵ Retail competition – the benefits must not be underestimated, Power UK 89, July 2001, pp. 17-25.

²⁶ Graham Shuttleworth, Letter, Power UK 90, August 2001, pp. 3-4. Reply by SCL, Power UK 91, September 2001, pp. 44-5.

Direct access to wholesale spot price in California

The problem in California was not a lack of faith in the benefits of a competitive retail market, nor the failure of that market per se. It is often said that California's experience reflected a mixture of bad luck and bad judgement. The bad luck was the upturn in demand coinciding with the reduced availability of hydro capacity. The bad judgements included the undue restrictions on construction of new capacity, the regulatory insistence that utilities purchase generation only in the spot market, even though subject to a fixed retail price cap, the inadequate consideration of the feasible level of that cap, and the reluctance to increase it when it was plainly untenable. The list should probably also include undue restrictions on the ability of the system operator to contract ahead to minimise vulnerability to the market power of generators.

There have been several excellent papers on the experience in California²⁷. Less well appreciated is an aspect of the regulatory policy that was advocated by several leading economists, yet in my view hindered rather than facilitated the transition to a competitive retail market. This was the policy of direct retail access to the wholesale spot market that was briefly implemented in San Diego. It too reflected a failure to appreciate the importance of forward contracts in minimising risk in a competitive market

After a utility's stranded costs were paid off, it was effectively required to exit the retail supply business and concentrate on distribution. Customers could choose another supplier, from whom they could purchase at fixed prices or on whatever other terms were on offer. If they failed to do so, the utility was required to pass through the wholesale spot market price. Supporters of this policy argued that it gave all customers the benefit of direct access to the competitive wholesale market, without the need for retailers. Retailers would survive and prosper only if they added value to this service – for example by providing fixed price hedges that customers were willing to pay for.

San Diego was first to pay off its stranded costs, and it moved to this policy. At the time, spot market prices had not increased, and customers did not switch supplier or arrange hedges. When spot prices did increase, customer bills rose sharply, doubling or even trebling. There was public outrage and demands that something be done.

The California State Government decided to intervene in the process. It argued in favour of generation price caps and against increasing retail price caps. It spent about \$11 billion on large scale long-term purchases of high-priced generation output, some of which it subsequently had to sell at an enormous loss. It is still trying to find a way to fund this. It proposed to take one of the transmission networks into public ownership. Most recently it has proposed to repeal the ability of residential customers to choose their own supplier. It is difficult to imagine a more counter-productive set of measures.

A better approach than direct retail access would have been to leave alone the customers that did not switch supplier. They would continue to be supplied by the utility's retail supply business under a regulated tariff. UK experience is that customers both large and

²⁷ E.g. Joskow 2001.

small have generally rejected the opportunity to buy on spot price terms. They prefer fixed prices, or limited and well-specified demand management terms. I am not aware of any country other than Norway where any residential customers have chosen wholesale spot prices. Even in Norway that proportion seems to be small. At the end of 1999, 85 per cent of households had chosen variable price terms where the price is fixed at any time with the supplier able to give notice of change. Of the remaining customers, some were on a fixed price tariff. An unspecified proportion, but evidently less than 15 per cent, had chosen to pay a markup on spot price.²⁸ I understand that even here a maximum price “insurance policy” was typically offered.

Regulatory policy thus forced customers in San Diego on to an unfamiliar and inappropriate tariff. Many may not have been aware what was happening. In effect it forced them to incur a further cost of choosing and purchasing a hedge from a new retail supplier. It would have been less disruptive and less costly to let customers stay with their existing supplier. They could then switch supplier if and when they saw it as advantageous to do so. A transitional price cap implemented as in the UK would have seen customers, and the industry as a whole, through the turbulent events of 2000 to 2001²⁹. No doubt there would still have been some complaints, but there would have been many fewer than were actually made. It is questionable whether they would have triggered the unhelpful series of Government interventions.

Suspending retail competition in California

These Government interventions are increasingly serious. On 20 September of this year the California PUC voted to suspend the right of customers of any size to enter into direct access contracts or agreements, effective immediately³⁰. Direct access is what we would call second tier supply in the UK³¹. The reasoning was as follows.

Recent events in the California electric market have caused a radical change in the area of direct access. First the Governor’s Proclamation of January 17, 2001,

²⁸ NVE 2 January 2000.

²⁹ “It was expected that most retail customers would gradually migrate to electricity service providers during the four-year transition period.” (Joskow, August 2001 p. 7) A four-year price cap set before the market opened in April 1998 would have been consistent with utilities and other retail suppliers hedging at “normal” prices. This would seem to have still been possible even if the cap had been set for two years from April 1998, and renewed in the winter of 1999-2000 for a further two years from April 2000. The relevant prices are the two-year contract prices obtaining in the forwards markets in late 1999. Not having those to hand, I note that average day-ahead price in the California PX during October 1999 to March 2000 was only a third higher than in the same months of the previous year. The average price was actually lower in February 2000 than in any previous month apart from May and June 1998. (Joskow, Table 1) Moreover, “In March 2000, the California Energy Commission continued to publish projections of wholesale market prices in the PX for 2000 and beyond which were in the \$28 to \$35/MWh range.” (Joskow, p. 24) “It is quite clear, however, that the terms and conditions of these contracts [negotiated by DWR in early 2001] would have been much more favorable if the state had encouraged the utilities to enter into longer term contracts in 1999 or even during the summer of 2000 when they requested this authority. Moreover, earlier contracting activity likely would have mitigated some of the problems that emerged during the late fall and Winter of 2000/01.” (Joskow, p. 38)

³⁰ Interim opinion suspending direct access, A.98-07-003 et al.

³¹ “A direct access customer receives distribution and transmission service from the utility, but purchases its electric energy from its electric service provider.” Interim opinion p. 2.

found that an emergency situation exists in the electricity market in California threatening “the solvency of California’s major public utilities,…” Second, on February 1, 2001, Assembly Bill No. 1 from the First Extraordinary Session ... (AB 1X) was signed into law which, among other things, requires that the Department of Water Resources (DWR) purchase electricity on behalf of the customers of the California utilities.

This bill, called AB 1X, provides that the right of retail end use customers to acquire service from other providers shall be suspended until the DWR no longer supplies power. The PUC took the view that “In order to address the rapid, unforeseen shortage of electric power and energy available in the state and rapid and substantial increases in wholesale energy costs and retail energy rates, that endanger the health, welfare and safety of the people of this state, it is necessary for this act to take effect immediately.”

The PUC noted that

Currently, the State of California through the DWR is purchasing electric energy on behalf of the utilities’ existing ratepayers ... with funds from the State’s General Fund and an interim loan. To repay the general Fund and continue the power purchase program, state agencies are preparing to issue DWR Power Supply Revenue Bonds. We have been informed by the State Treasurer’s Office [and other agencies] that “to sell the bonds with the investment grade rating required by law, it will be necessary to control the conditions under which ratepayers (generally large users such as industrial customers) ‘exit the system’.”

The PUC commented

We note that the suspension of the ability to acquire direct access service will provide DWR with a stable customer base from which to recover the cost of the power it has purchased and continues to purchase.

The PUC continued

Customers might be tempted to switch from utility bundled service to electric service providers in order to avoid some of the impact of higher rates and take advantage of lower spot market prices. It is not in the public interest to permit such behavior. All ratepayers benefit from the State’s actions to ensure reliable electricity service and, therefore, all ratepayers should contribute to the effort to pay down the unprecedented debt incurred by the State to help weather the energy crisis.

Two of the five PUC commissioners dissented from the majority view. They wrote One could say that this order is consistent with the Administration’s present third world country mentality. We are punishing the very consumers who made a commitment to ensuring electric restructuring did work by adding a demand retail component to cure the dysfunctions in the wholesale market.

We are not convinced that the DWR bond ratings depend on killing direct access. This notion is a scare tactic and a smoke screen. Direct access comprises such a

small percentage of overall demand that it cannot reasonably be seen to be a threat to the sale of the bonds. ...

Something else is going on here. We think that the DWR does not want direct access because if the public is presented with alternatives, it will make the DWR's purchasing mistakes abundantly clear...

DWR and the bonds should not be threatened by direct access if DWR is making prudent energy purchases. Only if DWR's contracts are too expensive, relative to market, will customers seek shelter in lower direct access prices. Indeed, retaining direct access as a way to send price signals to consumers may be the only way to place pressure on DWR to make more prudent purchases.

The cases for preventing full retail competition and for allowing it could not have been presented more clearly. Those who doubt the case for full retail competition and argue in favour of regulated monopoly should consider these events carefully. As one of Harry Enfield's characters is fond of saying: "Is that what you want? Cause that's what you'll get."

A transitional retail price cap

The final question on this issue is whether California should have regulated the retail tariff charged by the incumbent utility once the retail market was open, and if so how. I can appreciate that the PUC felt that this was an unattractive prospect. Any regulator faces considerable difficulties in deciding what generation and other costs to allow and what not to allow. It was precisely because of these difficulties that I argued at the time of privatisation for retail competition to obviate or at least minimise the need for such regulation.

The obligation to retain a franchise monopoly for eight years in the UK meant that we had to design and implement retail price controls for that period. We also decided to keep a transitional retail price cap on the residential market for another four years. So even though we got rid of most retail price controls, not quite all have disappeared yet. However, our experience during that period led us to a transition policy that seems to have worked well here, and could do so elsewhere.

In brief, when the residential market opened we moved from a cost pass-through control to a fixed price cap. We made sure that the level of the price cap explicitly covered the cost of entering hedging contracts for the duration of the price cap.³² Whether each incumbent supplier chose to do so was a matter for itself.

³² There is a legitimate concern about the cost of providing default service, for example if customers leave when prices are low and return when they are high. If the price cap is used for this service too, it must be set to include the relevant costs. Spot market prices could be an option here, without being compulsory for all customers.

In a competitive market it was no longer necessary or desirable to ensure that price equalled cost actually incurred. We did not seek to remove all the risk and margin from the incumbent supplier. If profit was so high in relation to the risk that competitors could offer a better deal, they were free to do so. Such competition would protect customers, who were now free to go elsewhere. The purpose of a transitional price cap was primarily to ensure that things did not get worse as the market opened and as customers and suppliers each gradually came to understand an unfamiliar world. For those who chose a lower priced supplier it would get better. Actually, things got better for all customers because in setting the level of the price cap we were able to pass on to customers the benefit of ending the high priced coal contracts. But this was an exceptional circumstance.

This approach worked. Competitive suppliers were attracted, and customers were too. The competitive market has developed, to such an extent that Ofgem has indicated that it expects to remove the price cap next year. And rightly so. At the present rate of switching, about one third of residential customers will have moved from the incumbent supplier by the time the price cap ends. It is no longer needed.

I would emphasise only one further point. Setting a transitional price cap until competition is effective does not mean setting that price cap at the lowest level that price would be if competition were already effective. Nor does it mean trying to estimate what the costs of an efficient competitor would be, and periodically updating the price cap to reflect the past and/or future movements of such costs. That may well be appropriate in some form for a permanent price control on the monopoly sector of the industry. But there is a real danger that such an approach would stifle the growth of competition and undermine the criteria for removing the control. I took issue with Ofgem on this point last year³³. Fortunately the danger was averted. However, I fear that the danger looms large in the proposals of the Office of the Regulator General three weeks ago for a retail electricity price cap in the Australian state of Victoria³⁴. Closer to home, I fear that it is also reflected in Oftel's proposals for the mobile telecommunications market, issued only two weeks ago³⁵.

Wholesale trading arrangements

The Pool set up in England and Wales at the time of privatisation was compulsory in the sense that all generators were required to bid into the Pool, the day before "real time" and all suppliers or retailers were required to buy out of the Pool. The System Operator scheduled plant and set market-clearing prices for each half-hour period of the next day. Market participants typically entered contracts for differences around these Pool prices, to hedge their risks.

³³ Promoting Competition in Electricity Supply", Power UK, Issue 68, 29 November 1999, pp. 12-19.

³⁴ Office of the Regulator General, Draft Report – Options for the Review of Retail Electricity Tariffs, 17 September 2001.

³⁵ Oftel, Review of the charge control on calls to mobiles, and Effective competition review: mobile, both 26 September 2001.

Different countries have implemented variations on this theme, and there has been considerable refinement over time. For example, the National Electricity Market in Australia now has a succession of markets held every five minutes. Some countries have separated the functions of System Operator, Market Operator and Transmission Operator; others have combined some of these. Among the live issues at present in the US are the scope for Regional Transmission Operators, the best way to deal with transmission constraints, and the externalities associated with interconnecting systems. These are important issues, perhaps more important in the US than in England and Wales, and they have also influenced the development of US Pools, but there is unfortunately not space to deal with them here.

The compulsory nature of the Pool has naturally been questioned. Increasingly, arrangements are accommodating physical as well as financial bilateral trading outside the Pool. The PJM and New York (or Northeast) Pools are said to be explicitly designed to facilitate bilateral trading as much as possible. But these issues were not so clear some years ago. Two contrasting experiences are worth exploring.

In California there was a contentious debate between advocates of a “Poolco model” and advocates of bilateral trading. According to Paul Joskow,

the ultimate design of the wholesale market institutions represented a series of compromises made by design committees including interest group representatives, drawing on bits and pieces of alternative models for market design, congestion management, transmission pricing, new generator interconnection rules, and locational market power mitigation. ... The end result was the most complicated set of wholesale electricity market institutions ever created on earth.³⁶

The core of the design were an Independent System Operator (ISO) and a Power Exchange. Subsequent experience was problematic, including lack of coordination between the two institutions.

In January 2001 the Power Exchange stopped operating and eventually filed for bankruptcy. Since then, there has been no public organized power exchange in California. Buyers and sellers rely either on bilateral contracts which are scheduled with the ISO, self-supply in the case of the portion of utility load that can be served from their remaining resources, or purchases from the ISO’s real-time imbalance market.³⁷

The other experience is the New Electricity Trading Arrangements that have operated in England and Wales since the end of March this year, in place of the Pool established at Vesting. NETA was preceded by a quite remarkable barrage of criticism, not least from commentators in the US. NETA has also caused consternation among countries in course of implementing electricity reform. I well remember delegates from the regulatory body of one east European country coming to see me at OFFER. They had the restructuring of their industry all planned out, including a Pool, precisely as in England and Wales. But

³⁶ Joskow p. 11

³⁷ Joskow fn 15 p. 11

now we had announced that the Pool concept was all wrong. Could I please confirm to them that at least one had to start with a Pool?

I'm not sure of the answer to this question. The Pool concept is now tried and tested in many economically developed countries, and some developing ones. But would it work in countries where the accurate transmission of information and the routine enforcement of contracts cannot be relied upon? Does the logic imply that we should be working towards a single Pool across each continent, including the US, Europe, India and Africa?

It might help to answer these questions if we could clarify our thinking about NETA. Is bilateral trading with appropriate real-time balancing arrangements the way to go, or simply misguided? Is there a real difference about the bulk of the trading, or is the real debate limited to the precise nature of the balancing arrangements?

Early criticisms of NETA

The predominantly academic or professional criticisms of NETA (as opposed to the concerns of interested market participants) seem to fall into two main categories. The earlier criticisms focused on market power, the merits of more moderate reform, pay-as-bid, and the role of simulation models and evidence. David Currie³⁸ dealt with many of these concerns last year, and I agree with his arguments.

Briefly, Offer was not deluded into thinking that the Pool was the only source of market power. We thought it exacerbated the extent of market power, but we knew parallel action had to be taken on the structure of the generation market, and when the opportunity arose we did so. We were sympathetic to many of the particular modifications proposed to the Pool, like firm bids and the abolition of the capacity levy. However, we doubted that they were more easily delivered or more predictable than more fundamental reform, and they did not deal with the problem of the uniform System Marginal Price. We thought that pay-as-bid in place of a uniform system marginal price would have a beneficial effect on the competitive process in both generation and retail supply. We were not convinced that this would increase risk, because it would apply to a voluntary mechanism covering a very small part of the market, not to compulsory bidding into the previous Pool. This was a point that our critics generally overlooked. We tried to take account of economic theory, empirical evidence and system modelling. However, we were not as convinced as some critics evidently were of the possibility of modelling a new system adequately, conclusively and in a timely way, consistently with the needs of users and the window of opportunity available.

Centralised versus decentralised contracting

The main issue I want to explore here is the concern succinctly expressed by Larry Ruff, but evidently shared by others including Bill Hogan.

³⁸ David Currie, "The New Electricity trading Arrangements in England and Wales: A Review", Beesley Lecture, IEA/LBS, 10 October 2000, revised version February 2001.

The giant step back in NETA is OFGEM's outright rejection of the very concept that has made competition in electricity practical – a central spot market integrated with physical dispatch – in favour of the discredited idea of an electricity market based almost entirely on decentralized contracting³⁹.

Let me first acknowledge that Larry's contribution to designing the original England and Wales Pool was a giant step forward because it made it possible to privatise the industry in England and to introduce competition. He showed how to cut through the fruitless debates about trading contracts in the G Pool and the D Pool and the difficult issues assigned to the increasing number of "boxes on the bridge" between them. However, whether or not that particular version of contracting is discredited, no-one is advocating that earlier idea today.

The Pool and the CEGB that it replaced both involved a system of centralized dispatch. Both assumed that it was the job of what we now call the System Operator to ensure the efficient scheduling of plant. It was accepted that in a competitive market it is up to the individual market participants to choose what plant to build and how to run it and how to bid it. Nevertheless, the System Operator's job was to decide what plant should be run so as to maximise system efficiency, given the bids before it, and to instruct the plant accordingly. It was also the System Operator's job, or that of an associated process, to tell the buyers and sellers what price they had to pay or be paid in the first instance.

In practice (as some of my commentators have emphasised) some generators were in effect able to decide that their plant should run, by bidding zero in the knowledge that they would nevertheless get the system marginal price. They also entered bilateral contracts for differences that determined what they would be paid regardless of what Pool price was. But not everyone could do this, and it is not clear that everyone accepted zero bidding as consistent with either the ideal of the Pool or with normal competitive markets.

NETA explicitly rejected the propositions about the role of the System Operator in determining prices and schedules for the bulk of electricity output. It affirmed that, within specified but minimal limitations, it is the job of electricity participants themselves to decide which plant they wish to run, and to self-dispatch that plant. It is the job of the System Operator to make this possible. The System Operator takes orders instead of giving them. Moreover, it is no longer any business of the System Operator to dictate the terms on which the bulk of electricity output is traded.

This transformation of roles seems to me fundamental and eminently reasonable. In an increasingly competitive market, generation plant will be in many separate ownerships and there will be many competing suppliers. Constantly fluctuating market conditions,

³⁹ Larry E Ruff, "The Proposed 'New Electricity Trading Arrangements' for England and Wales: A Setback for Competition, Consumers and Logic", *Electricity Journal*, January/February 2000, pp. 69-72. See also W W Hogan, The Power of Competition, Cantor Lecture 2, *RSA Journal*, 2/4, 2000. W W Hogan, Electricity Market Restructuring: Reform of Reforms, 20th Annual Conference, Center for Research in Regulated Industries, Rutgers University, May 25 2001.

plus developments specific to each generator's plant position and each supplier's customer situation, mean that each market participant needs to engage in a continual process of contracting and possibly recontracting to minimise its risks, reduce its costs and maximise its competitive advantage. It is impractical for each generator and each supplier to keep the System Operator fully informed of all the relevant considerations necessary to enable the latter to maximise the efficiency of the system as a whole.

In other words, far from being discredited, an electricity market based almost entirely on decentralized contracting seems to me the only economic way to proceed. In fact, I suspect that it will be the converse idea, of an electricity market based almost entirely on centralized contracting, that will increasingly become discredited.

I cannot believe that Larry really disagrees with this. His earlier paper⁴⁰ clearly spells out the role of contracts leading up to what he calls the operational "day". I hope we are now agreed that US Pools in the northeast and NETA (and in practice the E&W Pool to a significant extent) are all based almost entirely on decentralised contracting.

The qualification "almost entirely" is important. As Larry points out, it is not feasible to expect the System Operator to feed back signals for the market participants to respond adequately in real time. At some point the System Operator has to take decisions to balance the system, based on the prices bid and offered to it, and schedule changes in plant accordingly. But all this is not in dispute as between the proponents and critics of NETA. The main outstanding issue (deferring transmission constraints for the moment) is precisely how those balancing trades are paid for.

Single or dual cash-out prices

Detailed proposals on cash-out prices first appeared in 1999. Ofgem argued that "in principle, imbalance cash-out prices should reflect the full costs of imbalances having to be resolved by the System Operator over relatively short timescales".⁴¹ Ofgem concluded that a dual cash-out price was required. In contrast, Larry Ruff argued that there should be a near-to-real-time spot market, with in effect a single cash-out price.

In practice, the difference between the two approaches has been very significant. In the first few days of NETA, at the end of March, System Buy Price averaged over £103/MWh while System Sell Price averaged under £3/MWh, a spread of £100/MWh, against a generation price of around £20/MWh in the bilateral markets and power exchanges⁴². Since then the spread has fallen considerably, to about £30 System Buy Price to £10 System Sell Price. Nonetheless, the spread is still a major concern to most generators, particularly of renewable energy who cannot always easily control their level of output.

⁴⁰ Larry E Ruff, "Competitive Electricity Markets: One Size *Should* Fit All", Electricity Journal, November 1999, pp. 20-35.

⁴¹ Ofgem, New Electricity Trading Arrangements, July 1999 p. 51

⁴² Ofgem, The New Electricity Trading Arrangements, A review of the first three months, August 2001.

The Ofgem principle – that imbalance cash-out prices should reflect the full costs of imbalances - is surely correct. It would be inefficient to charge a single cash-out price if the costs of dealing with under- and over-contracted participants were to differ significantly. However, on the basis of my admittedly limited knowledge of the balancing mechanism, it is not clear that these costs do differ significantly in most cases. NGC takes its decisions based on the aggregate situation, and is not aware of the contract positions of each party. In most cases, therefore, it is not clear that a dual cash-out price is called for. Here I agree with Larry and Bill about the potential inefficiencies that could be caused by significantly divergent prices.

The designers of NETA will no doubt have had to consider certain broader issues. For example, would the pricing principles in the balancing mechanism be consistent with changing the attitudes, awareness and opportunities of market participants so as to promote a more competitive market in both generation and supply? Would they encourage sufficiently balanced contract positions that NGC would be able to balance the remainder of the system in less than four hours compared to the previous twenty four? I would not underrate these considerations. It is important to get “the big picture” right as well as the details of price in relation to cost.

As regards that big picture, the present position seems encouraging. I understand that about 92 % of trades are now bilateral, about 5 % are in the power exchanges, and only about 3 % in the balancing mechanism. NGC seems to be coping well with the task of balancing the system. Indeed, it is coping increasingly well, and its costs of doing so have reduced.

Experience overseas is not inconsistent with this. Pools elsewhere in the world are increasingly moving towards facilitating bilateral markets (both physical and financial) and forward exchanges, with their own roles as crucial but relatively low volume balancing markets or mechanisms. The use of a single balancing price does not seem to have led to undue reliance on the balancing market. For example, in Norway the proportion of trades in the so-called regulatory market has continued to be very small⁴³. The National Electricity Market in Australia now sets a price (SMP) every 5 minutes, but almost all electricity is traded earlier on a bilateral basis. The proportion traded in the balancing market is similar to that in the UK. In the PJM the proportion of electricity traded on the spot market was higher, at 18 per cent in 2000⁴⁴. The proportion traded at market-clearing price in the NZEM spot market was as high as three quarters last year, when bilateral trading accounted for only about a quarter of the total output.⁴⁵ However, since then generators have “self-hedged” by acquiring retail customer bases, and the proportion traded in the spot market may now be down to about 20 per cent⁴⁶.

⁴³ Meanwhile “From 1997 to 1998 the turnover in the Elspot market [day-ahead with hourly market-clearing price] rose by 30 per cent and in the financial market [for hedges] by 70 per cent. The turnover for the clearing service [for Elspot and bilateral trades] rose by almost 200 per cent.” (NVE January 2000) It is not clear what happened to the proportions of bilateral and market-cleared trades.

⁴⁴ Testimony of Philip G Harris to the US House Subcommittee on Energy Policy, 2 August 2001.

⁴⁵ Inquiry into the Electricity Industry, Report to the Minister of Energy, June 2000

⁴⁶ Personal communication.

In the light of this experience, it is appropriate to consider gradual modifications to the details of the cash-out mechanism, as David Currie himself urged. For example, the recent reclassification of shorter (under 15 minute) balancing contracts as system balancing rather than energy balancing seems more accurate, and is likely to reduce the spread of the dual cash-out prices⁴⁷. Further modifications should be considered on their merits, but in general a reduction in the spread of cash-out prices should be welcomed, together with increasing provision for default to a single cash-out price when there are relatively few balancing trades in the opposite direction. This might be coupled with another of David Currie's suggestions, namely a charge for discrepancies between a generator's final physical notification and its actual metered position. The generators' physical positions are important factors in NGC's actual operation of the system.

Changes of this kind should justifiably relieve the situation of generators in general, and of renewable generators in particular, without compromising the principle that each market participant should be charged the costs that it imposes on the system. Some of the modifications proposed to avoid the balancing mechanism may no longer be needed. And a reduction in the so-called "beer fund" (which arises from the spread between the dual cash-out prices) would also be desirable in itself.

As a result of such modifications there may be greater use of the balancing mechanism. This is not undesirable given that the market seems now to have changed irrevocably and assuming NGC can cope. Refining the cash-out calculation will enable an increasingly efficient allocation of trades as between the bilateral markets and forwards exchanges on the one hand, and the balancing mechanism on the other.

Conclusions

I hope that I have said enough to give a flavour of what is happening in electricity regulation in at least some countries around the world. A wide variety of issues is being actively debated internationally. Industry participants, customer groups, academics, consultants and not least regulators themselves are active participants in these debates. One theme emerging from analysis of experience to date is the scope for improved regulation to promote a competitive market, and not intervene unnecessarily.

I would not wish to be critical of regulators here. In addition to all the debates I have referred to, they have to cope with many official and quasi-official reviews, often trying to second-guess the regulator's decisions. Whether these reviews tend to generate heat or light is debatable, but they certainly take up considerable regulatory time and effort. Maybe those who so readily demand cost-benefit analyses of regulatory actions, should consider such analyses of regulatory reviews. My own impression is that regulators are already thinking seriously about all these issues without further prompting. Electricity regulation is generally alive and well all round the world, perhaps too alive and well for some peoples' taste.

⁴⁷ Given the likely increase in system (as opposed to energy) balancing costs, it would seem desirable to find ways of relating the recovery of these costs to the rapid fluctuations in output or to demand that tend to cause them.

