

## CENTRALISED BUT PRIVATE ORIGINS

Electricity systems in many developed countries started as private enterprise. In some this was short-lived, and state ownership predominated for some or all of the twentieth century. For most of that century vertically integrated monopoly provision was the rule, either by private operators subject to regulation or by state operators subject to less structured political regulation. In part this shift was motivated by the physics of integrated electricity networks – the requirements of technical coordination in growing and increasingly integrated national networks – but it was also a reflection of political economy.

## DECENTRALISATION AND PRIVATISATION HIGHLIGHTING GOVERNANCE

Developments in technology and economics have reduced the importance of unitary control (state or otherwise) of electricity systems. They have enabled imperfect competition to be introduced into generation and retailing, against a backdrop of monopoly, for the benefit of consumers of all sizes. Poor performance of centralised systems, and changing political imperatives have also spurred change in how electricity systems are viewed and run. Modern economies demand ever more of electricity, in terms of both quality and quantity. These factors, and fiscal constraints, which are one motivation for privatisation, tilt away from centralised control to more decentralised solutions. Increased resource competition, including from environmental interests and, in respect of water resources, from farmers and recreational users, have all played a role.

As suggested in Chapter 1, a consequence of these changes is that “power” increasingly relates not only to the technology of electricity, but also to its governance and wider political economy. Questions of competing resource use, the evaluation of increasingly scarce resources (water, clean air, grid capacity), industry evolution, and governance of industry institutions all now come to the fore. To a greater extent than before, those bearing the costs of decisions affecting the electricity sector have enjoyed the possibility of involving themselves in the solutions.

To a large extent the trend in reforming countries has been towards “facilitated” industry development. By virtue of direct government ownership or heavy regulatory interest at the start of the reform process, reform requires relinquishment of some measure of control by centralised states/regulators in favour of decentralised, industry-led control. The process is therefore necessarily “top-down” rather than “bottom-up” in its thrust. Some authorities have found it harder to “let go” than others, and where reforms have been poorly implemented (such as in California) it is natural, if not necessarily

helpful, that heavy re-intervention has resulted. In England and Wales, by contrast, re-intervention resulted in a radical change in direction under NETA, with a notable dichotomy resulting – that between privatised operations with highly decentralised markets, and ongoing state control. In most countries, the continuing drift is to regulatory structures that facilitate decentralised operation of electricity markets.<sup>1</sup>

## NEW ZEALAND RE-CENTRALISING WITH ONGOING STATE OWNERSHIP

In New Zealand, the recent shift has been towards a combination of continuing state-dominated ownership of generation, retailing and transmission, modified yet mostly still-local ownership of distribution, new heavy-handed regulation of transmission and distribution, and a resumption – or indeed assumption – of centralised government control after a period of industry-led self-governance. This move has been characterised as necessary given the experience of the 2001 winter crisis, but the history of winter crises in New Zealand shows that the reformed electricity sector has clearly bettered its predecessor in this regard. Supply security is apparently now the industry's greatest challenge – one which it supposedly has not met – but lack of security was enjoyed before the reforms, and recent moves will not ensure it either.

## SUPPLY SECURITY A FOCUS

In part New Zealand's reversion to centralised industry control may be based on a misunderstanding – it is questionable whether, as a goal, supply security makes any sense in the context of a properly functioning market-based electricity system. Alternatively, this reversion may reflect an unwillingness on the part of some to accept the new environment. The misunderstanding is that all electricity users demand a given level of supply security, and are willing to pay the same level of “insurance premium” to achieve it. It is natural, based on such a misunderstanding, to be apprehensive at a reformed electricity sector's lack of obligation or centralised coordination to ensure “the lights stay on”. It is also misplaced. In the reformed environment it is up to electricity users and suppliers to seek out arrangements for their own supply security, if that is more economic than investing in interruptible load, self-generation, process flexibility and/or energy efficiency. This carries costs. Before the reforms of the early 1990s all parties lacked the clear price signals (whether real-time pricing, or fixed prices incorporating “insurance premiums”) they needed to make these costs bearable. It is natural that they should not wish to face these signals, as that implies other electricity users are paying the necessary costs for them. Without all decision-makers bearing price signals, decisions about the socially desirable use and production of energy will not occur.

<sup>1</sup> See Burr (2004), for example, on progress in developing the huge US midwest electricity market.

## DECENTRALISATION PROVIDES OPTIONS

There is a flipside of reform that some might struggle to accept. Decentralised reforms provide consumers with options – from whom to buy their electricity, in what form (i.e. risk and term characteristics), and at what cost? But they also require electricity users to make choices, and to seek out and even create solutions that might not even have been possible before. Electricity is no longer something that just comes out of the wall at a regulated price. There is now a menu of possibilities from a range of sources, either on offer or achievable. Electricity users must now consider which option is best for them, and engage with suppliers to secure new options where they are not already available. Markets do not consist simply of supply, or of demand, but the dynamic and active engagement of the two. This engagement encourages the active pursuit of solutions to energy efficiency that flow through to the use of resources so important to the economy and environment.

For individual smaller users the cost and expense of active search, investment and management of electricity *per se* is typically not worth the trouble (even if other moves, such as insulation, are more likely to be worthwhile). Most households, on average, spend less on electricity each week than they do on takeaway meals. The savings achievable from consumer search are small. As such, most are likely to be happy for simple certainty on price, quality and supply. Through the vertical integration of generation and retailing, each is typically enjoyed. Even during the 2001 winter supply crises and 2003 winter scare, smaller users were oblivious to the dramatic increases in wholesale electricity prices required to ensure demand stayed in balance with genuinely scarce, weather-affected supply. If they had not been, they instead might have engaged in the usage reductions necessary for larger users who had greater exposure to wholesale prices. It is no surprise that voluntary power savings – a relatively costless solution – were required. Since some retailers also offered rebates for small customers to reduce consumption during the crises, such voluntary savings were only part of the solution. In any case, blackouts were averted in the midst of scarce supply – a vast improvement on the pre-reform experience.

## DEMAND-SIDE RESPONSIVENESS – HELPFUL, BUT DESIRED?

Securing a demand-side response from smaller consumers remains a challenge. Given the measured insignificance of electricity costs to individual households, most have little incentive to invest in costly energy efficiencies or to conserve. The same can be said when wholesale prices temporarily surge, given that most households do not face immediately increased power bills as a consequence. The size of such occasional surges, however, carries the potential for a very real small-customer demand-side response – if technology would allow it. Since wholesale prices peak at many times their normal level, this implies a latent source of profit that even small

households might seek to exploit if only they could. With improvements in metering and communications technology it should be expected that smaller customers will one day be able to exploit profitable opportunities to sell surplus energy, through power exchanges, to other customers more desperately in need of supply when wholesale prices surge. This should unlock significant new capacity in future supply shortages, and simultaneously reduce the size of price spikes and any incentives for the exploitation of generator market power. Although there are potential household benefits in alternative supplies – e.g. solar heating – a power exchange would provide an additional incentive.

For larger users the options available in the reformed electricity sector, and the incentives to seek them out, are greater than for smaller customers. Large industrial customers have traditionally enjoyed lower electricity prices than other users, and this has remained under the reforms: indeed, the relatively higher prices paid by households will in part reflect their insulation against short-run price fluctuations. In the face of challenges to supply security, larger users now bear an increased level of price risk, particularly when supply is scarce, which is to be expected since they also comprise the lion's share of demand. Before the reforms all users absorbed this risk through greater exposure to blackouts. Now larger users bear it in the form of potentially large increases in short-term prices. This has spurred them to more carefully manage their electricity usage and to contract for their preferred supply- and price-risk profile. It has also provided them with opportunities to profit (when the value of their output is not as great as the returns they enjoy) by selling surplus power under fixed-price contracts to other users for whom spiking wholesale prices are not high enough to curtail demand.

## GAMING INCENTIVES

Larger users also face other options and incentives, however. In making the investments required to better manage energy usage, and supply and price risk, they must balance the associated costs with the available alternatives. The most obvious is to “game” the reformed electricity sector, by lobbying for favourable changes to industry structure and rules. The more that industry control is centralised – and the fewer, more organised and resourced the larger players – the lower the transaction costs of doing so. The more such control is centralised in the hands of regulators and ministers with discretions, rather than market rules and independent surveillance, the more the regulators and ministers become the target of such gaming, and the less clear and transparent the gaming becomes. Such a shift can also attenuate their ability to secure change, with competing interest groups also able to exploit such channels. Consumers or users outside the circle of effective interest groups, however, may bear more than their fair share of any resulting changes. Such an interpretation can be attached to the reintroduction of centralised industry governance, and to imposition of an energy tax on all consumers to fund the reserve generation scheme.

The supply side of the electricity industry can also engage in such gaming – some might say “more so”, because of its information advantages and centrality in meeting current and future supply. But it also has other instruments at its disposal to reduce its exposure to gaming by others. Finding ways to lower the transaction costs of meeting user needs is an obvious analogue to the more basic imperative for generators to supply at competitive prices. Small users can also organise to game the system, but once again the transaction costs of their doing so can limit their effectiveness and resulting benefits.

## RESPONSES TO GAMING AND MARKET POWER

Gaming and market power, more generally, will arise in any electricity system, reformed or otherwise. State ownership and/or control have traditionally been blunt instruments for limiting their undesirable effects. Advances in regulatory approaches, technology and the economics of electricity market design have allowed for more refined solutions. The use of incentive regulation combined with otherwise highly decentralised markets in NETA have largely eliminated the twin evils of gaming and market power, while at the same time allowing for consumer gains, greater demand-side participation (through power exchanges), and taxpayer enjoyment of the returns and decreased risk exposure achievable without state ownership. The same general findings apply to various extents to PJM, and other electricity markets.

New Zealand is instead opting for highly centralised responses to those issues. State ownership remains for most of generation and retailing, and for all of transmission. However inefficiently, any excess returns derived by generator market power (if and when it arises and is exercised) accrue largely to government. Similarly, any excess profits earned by transmission so accrue, but transmission pricing is regulated and the company is enjoined to seek efficiency rather than the standard business objective of profit. To price-cap transmission in such a state is of questionable merit (especially given regulatory costs), has unpredictable effects, and confounds accountabilities. Similarly, to price-cap distribution companies owned by cooperatives and consumer trusts is excessive, given their different objectives and the hedge such ownership provides against monopoly abuses. The purpose of such regulation is unspecified and, particularly with multiple agencies regulating prices, the outcome for consumers is highly problematic. Significantly, New Zealand's transition to heavy-handed regulation has not been accompanied by an allocation of function and responsibilities that enable principles of standard regulatory mechanisms to be effected. It is curious that the matter of monopolies in electricity distribution receives such regulatory attention given that there are unregulated local-body monopolies in water and sewerage provision in most parts of the country.

## PRESERVING INVESTMENT INCENTIVES

Certainly it will be important to ensure that New Zealand's recent shift from light- to heavy-handed regulation does not stifle desirable investment. This is more an issue for non-central-government-owned distribution than for state-owned transmission, as the latter is now subject to the direction of the new Electricity Commission on its fundamental pricing and investment policies and therefore has little initiative to be stifled. Because of the interactive functions of the relevant players and the objective of the company, the outcome for transmission will be difficult to predict. New investment in distribution is required to accommodate demand expansion, and also innovative demand and supply management. It will be affected by restrictive regulation that has the potential to undermine the necessary returns,<sup>2</sup> with the result that either such investments do not arise in a timely fashion or they do so on uneconomic terms.

But regulatory risks are not the only obstacles to investment. The demise of Project Aqua has illustrated the problems of cost, delay and uncertainty surrounding the processes necessary to securing property rights required for long-term, large-scale generation investments. The unexpectedly fast run-down of Maui gas reserves has increased the urgency of finding alternative gas and other energy sources. The RMA process, the risks of that process being modified on an *ad hoc* basis, and the fundamental lack of certain, tradable water rights cannot enhance the prospects for hydro generation investments. So too does uncertainty surround Kyoto policy generally, and emissions-rights implementation and trading – all of these affect thermal generation (both gas and coal). It is curious that issues around environmental protection should be hindering large-scale hydro projects in favour of coal, although efficient coal-based generation would offer significant advantages over hydro in terms of supply security (given large domestic coal-reserves). Smaller-scale renewable generation projects such as wind power are at present limited solutions that carry their own costs and complexities (including environmental hurdles).

It is reassuring, if not surprising, that new generation investment has continued post-reform despite many of these uncertainties. Major surges in wholesale electricity prices during the winters of 2001 and 2003, when hydro reserves were scarce, certainly provided clear signals of the returns available to investors in new capacity. That the wholesale electricity price also falls to almost zero when hydro reserves are high further illustrates that the market is providing a clear indication of the shadow price of water – a price that is relevant in all its uses. It also belies suggestions that the wholesale price is dominated by market power, a conclusion supported by the fact that average prices have been below the predicted long-run marginal costs of new generation. It remains to be seen the extent to which the *de facto* price cap operative under the new Electricity Commission's reserve generation measures will constrain any required new investment.

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<sup>2</sup> An issue more or less present in all price-cap regulatory schemes.

## ELECTRICITY COMMISSION CHANGES INDUSTRY FOCUS

Aside from the reserve generation trigger price, the Electricity Commission is now well involved in the markets for electricity in New Zealand (a significant responsibility given the importance of electricity prices in determining the industry's future course). Governance and even operation of the industry's three main institutions – the NZEM, MARIA and MACQS – has now been merged under the Commission's purview. Wide regulatory powers were granted to it under its initial legislation; these were widened substantially in 2004. New Zealand was possibly unusual in the extent to which its major electricity-sector institutions were created voluntarily by industry with so little government control or input. In part, the NZEM's development could be described as a reaction against the 1991 pricing show-down between government and ECNZ when the extent of new industry freedoms was being tested. Perhaps the latest moves to centralise industry control in government hands is a corresponding counter-reaction, with the government unmistakably taking a firm hold of industry's "rattle". Certainly it represents a trend contrary to reforms in other countries: even in England and Wales, where strong regulatory intervention was the norm in the reformed industry, early failures led to greater market decentralisation rather than increased government control. A natural consequence of these moves is that any future industry failures, perceived or real, will increasingly be attributed to government and less to industry.

The major test now confronting the Commission is whether it will create an ongoing industry framework that fosters consumer-benefiting competition and encourages efficient investment. Each is crucially affected by choices regarding the nature and extent of now-due upgrades to New Zealand's transmission grid, since Transpower's all-important pricing and investment policies have become the responsibility of the Commission. If it opts for traditional, centralised and administrative approaches to grid expansions – based more on issues of technical security than competitive topology and economic welfare – then the benefits of future evolution of the sector should be expected to be constrained. If instead it opts for more decentralised solutions, by relying on market-derived evaluations of the costs of grid congestion and creating incentives for those bearing those costs to see them relieved, then superior outcomes should be the result. In any case, the problems of grid investment are arguably better resolved by improving the ownership structure of transmission – an initiative not currently under consideration, but mooted early in the reforms.

## NEW ZEALAND'S REFORMS SUCCESSFUL TO A POINT

New Zealand's electricity-sector reforms, like those in other jurisdictions, have had their successes. Importantly, they have not involved outright failures such as those in California. Certainly major distortions in previous arrangements, such as significant cross-subsidies from small commercial to residential customers, have now been

removed, creating a possible perception that the electorally powerful residential customers have suffered. But the taxpayer subsidies for generation (overcapacity), which arguably favoured larger users, have also been removed. Real price declines have been the norm in energy, transmission and distribution prices since the reforms began, without regulatory intervention: these are not the signs of reform failure. At the same time, more customer-focused options are now available to users – as they were not, before the reforms. As owners of state-owned generators and transmission, New Zealand taxpayers have enjoyed significant increases in tax and dividend payments that were not transparently available before the reforms. Taxpayers have also not had to reach into the public purse to fund new investments (or induced costly and environmentally insensitive investment as in the past). Potentially these benefits would have been greater, and the risks to SOE value from future industry changes less, had (even partial) privatisation been more widespread. Certainly, the sale of Contact Energy to private owners has not been to the detriment of electricity users or taxpayers. It is doubtful that industry arrangements existing before the reforms would have delivered the gains enjoyed.

#### MORE RECENT REFORMS CAST A SHADOW

It remains to be seen whether New Zealand's present isolated trend towards greater centralisation of industry control under government – given predominant state ownership – will persist, at least to the extent currently prescribed. In this sense it may prove to be a temporary oscillation in the context of a more consistent overall trend to decentralised electricity supply and demand decisions. It should be hoped that the broad thrust of the reforms will be preserved, not just to secure successes achieved but also because industry failings are vastly more transparent under recent arrangements than they were under their predecessors, and are therefore more amenable to timely and efficient correction. The danger would be to overreact to any perceived or real industry failings and so deepen the reversal of sound industry arrangements.

Over-anxious measures by government to elicit desired responses from industry may have the very opposite effect, causing private-industry players to react cautiously. This could leave only government able and ready to fill any gaps resulting from such a reaction. It raises the prospect of government crowding out or otherwise distorting private-industry initiatives, and finding itself solely responsible for industry's progress (and failures). Certainty over the industry's future overall course, including the bounds on government involvement, will be just as important to decentralised industry initiatives as beneficial policy choices along the way. Without such certainty, or given poor policy choices, the dangers of returning to the pre-reform model – of potentially counter-productive "de-reform", intended or otherwise – are increased.