Scorecard on Australia’s Electricity Market Reforms

By Malcolm Abbott, Graham Holdaway & Antony Cohen, KPMG in Australia.

The supply of electricity is a vital service in any economy, both as an input to the production of goods and services and a final consumer requirement. Today, Australia has around 47,000 MWs of electricity generation capacity with the industry employing nearly 40,000 people. The major generation fuel used is coal, with natural gas-fired and hydro electricity also important parts of the generation mix.

Over the past twenty years, the amount of electricity generated in Australia has grown steadily; at slightly less than the rate of growth of real GDP. At the same time, domestic air conditioning penetration has led to maximum demand growing a little faster than the overall economy, creating a challenging environment for any electricity sector.

Challenges notwithstanding, the power sector has been through a process of considerable reform and restructuring. This process has varied across Australia because of the federal nature of government – consisting of a national, six State and two Territory governments. Despite these differences, legislators have cooperated to establish the National Electricity Market (NEM) – which now covers the whole of Australia south and east of the ‘red centre’.

### Scorecard Approach

An article of this length cannot describe all of the changes that have taken place over the reform period, but some of the key developments that have occurred can be identified. Key benefits of the reform process can be highlighted, as can some of the problems that have arisen.

In doing so it is possible to draw up a ‘scorecard’ of the results of the reform process (Table 1). Typically a scorecard records the ‘goals’ scored both for and against a team to see if it has, on balance, won a contest. In this case, by identifying some of the benefits gained and losses endured, it is possible to measure the degree to which Australia has gained from the reform process.

### The State of Play Prior to Reform

Prior to 1990, the Australian electricity supply industry was dominated (in each region) by a single vertically integrated, State government owned authority. As well as generating and transmitting electricity, these bodies were also responsible for regulation of the industry in such areas as electrical safety.

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Under these arrangements, investment was almost exclusively the responsibility of State and Territory governments and their electricity authorities. Electricity prices were set by the State governments, and were designed to cover the industry’s costs, plus any return required by the government. Often politically motivated cross subsidies were built into the price structure.

Although government involvement enabled the mobilisation of capital to establish and develop the electricity system, by the late 1980s the efficiency and effectiveness of the industry was under serious question. Monopoly provision and the consequent lack of competitive pressures led to plainly obvious over-staffing and excessive costs – particularly in the construction of new plant.

In July 1991, the Council of Australian Governments agreed to reforms intended to introduce competition into the electricity industry. The basic approach agreed was to introduce competition into the generation and retail segments of the industry, regulate open access to the transmission and distribution elements, and establish a national systems operator and wholesale electricity market. As part of the process, regulatory functions were detached from the government owned companies, which were then given commercial structures.

Although a ‘national approach’ was taken to the introduction of competition and the operation of a national market, the question of industry ownership was left to the individual States to decide.

By fostering competition (wherever possible) it was hoped that a more flexible, cost efficient industry with the ultimate objective of delivering lower electricity prices would result. One of the chief benefits expected to arise from competition in the generation segment was a more prudent construction of power stations (a particular problem across Australia during the 1970s and 1980s). Reform was also expected to create incentives for the generation companies to operate their power stations more efficiently.

### Reform Gets Underway

The State of Victoria led the way in the implementation of this process. Initially the State’s integrated company was disaggregated into three interim operating businesses (generation, transmission and distribution/retail). Distribution/retail were subsequently divided into five companies with separate franchise areas and generation was broken up into seven separate generation companies. Between 1995 and 1997, these companies were privatised.

In New South Wales (Australia’s largest State) three competing generation

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**Table 1: Overall Scorecard for Reform of Australia’s Electricity Supply**

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<th>System Reliability</th>
<th>Capital Efficiency</th>
<th>Labour Efficiency</th>
<th>Investment Efficiency</th>
<th>Social Benefits</th>
<th>Prices</th>
<th>Government Financial Benefits</th>
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<td>Anticipated &amp; unanticipated net benefits realised</td>
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Source: KPMG in Australia, 2006
companies, an independent transmission business and six distribution/retail companies (later reduced to two) were created in December 1995. These entities remained in government ownership.

In Queensland, Tasmania and South Australia a similar process was subsequently undertaken with the creation of separate entities responsible for generation, transmission and distribution. In South Australia, the electricity assets were ‘privatised’ via long-term lease arrangements.

A competitive wholesale market started in Victoria in October 1994, with wholesale electricity traded through a ‘pool’ managed by the Victorian Power Exchange. A similar market began operating in New South Wales the following year and harmonisation of the two markets took place in May 1997. The National Electricity Market began its operations in December 1998 and besides Victoria and New South Wales, the States of South Australia, Queensland and the Australian Capital Territory subsequently joined. Tasmania joined the NEM on completion of an undersea transmission cable (Basslink) in 2006.

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The NEM is a wholesale market for the supply and purchase of electricity – combined with a regime of open access for transmission and distribution in the participating jurisdictions. Two companies, the National Electricity Code Administrator Limited (NECA) and the National Electricity Market Management Company Limited (NEMMCO), were formed to implement the NEM. NECA supervised, administered and enforced the industry code of conduct and NEMMCO managed the wholesale electricity market in accordance with the code. Generators bid electricity into a common pool and retailers purchase from the pool and on-sell to final consumers.

**Generation – A Significant Factor in Reform**

In order to manage fluctuations in spot market prices, retailers enter into financial hedging contracts with generation companies. Competition in the generation segment of the market is important as it makes up the most significant portion of the cost of supplying electricity (approximately 45-50%).

**Progressive Reform of the Retail Sector**

As well as wholesale competition, retail competition was also progressively introduced in each State. This stage of reform (although less important in terms of its relative size – 5-10% of total costs), is the one that is most noticed by consumers. In the Australian case, retail competition was introduced in the different States in a series of stages. Initially, only a small number of large consumers were able to exercise consumer choice. Retail competition began in Victoria in 1994 when large consumers (annual consumption of 40 GWh or greater) were allowed to choose suppliers. This competitive market became gradually larger in succeeding years. Large users were granted retail competition in New South Wales in 1996, and South Australia and Queensland 1998. Full retail competition was introduced in Victoria and New South Wales in January 2002 followed by other States and Territories.

There can be no question that reform of the sector has dramatically changed the manner in which it operates. As the wholesale electricity market and limited retail markets have now been operating for more than ten years, it is possible to get a very clear indication of some of the impact of reforms.

**Benefits in Labour & Operational Efficiency**

At the time of reform initiation, a number of benefits were expected from the introduction of competition. These benefits included such things as higher levels of operational efficiency of plant, more rational investment decisions, and ultimately lower real electricity prices. In the Victorian and South Australian cases additional benefits were expected to be derived from the privatisation of State owned assets.

In the case of operational efficiency, there is no doubt that levels in the industry have been greatly improved. From Figure 1 it can be seen that staffing levels in the industry fell dramatically through the 1990s – when most reforms were undertaken. At the same time, plant utilisation improved and plant reserve levels fell (Figure 2) indicating a higher level of capital productivity.

The generation and retail companies in Australia today (both private and government owned) face very real competitive pressures that did not exist before the reform process began. At the same time, transmission and distribution companies are the subject of incentive regulation which puts pressure on them to improve their levels of efficiency. Taken together, all companies operating in the
industry are under consistent pressure to improve levels of operational efficiency.

WHO HAS BENEFITED?

The beneficiaries of the gains in labour and capital productivity have been both consumers and the owners of the electricity sector companies. While there is much focus on private sector profitability, the remaining State government owners of power stations (for instance) today receive much greater returns on their assets compared to the pre-reform years of the 1980s.

Electricity assets owners do not, however, capture all of the benefits of the increases in competition and efficiency. Figure 4 shows the annual average price of electricity in Australia since the late 1980s. It shows that there has been a small but steady decline in the real price of electricity in Australia throughout the period. Although this is truer for businesses than residential consumers, nonetheless a wide variety of people in Australia have benefited from lower prices. This they have received either directly – or via the businesses they own, work for, or indeed buy goods and services from.

The level of retail competition activity has built up strongly since its full introduction in 2003. Customer switching got as high as 21% in 2005 in Victoria.2 Strong competition from out-of-State incumbents and new start up energy retailers has also contributed to this heavy level of activity. The introduction of new lifestyle products and affinity programs encouraged customers to shop around. Steady switching has also occurred in other States (New South Wales and South Australia). This activity shows that consumers clearly appreciate the gains that can be achieved from exercising consumer choice.

IMPACT ON INDUSTRY INVESTMENT

One of the concerns at the time of reform was that a disintegrated industry would not have the incentives to invest in additional generation to keep up with demand. Indeed, in the mid 1990s, there was a sharp reduction in investment in the industry (Figure 3). This decline, however, was entirely rational in that the State owned electricity authorities had over-invested in generation capacity during the 1980s and were also operating plant inefficiently. Consequently, it took some time for demand to catch up with supply. Once this had occurred, additional investment in new generation capacity took place, and from 1997 onwards there has been a steady rise in the level of investment in the industry.

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Recent investment in the industry appears to be far more attuned to the nature of demand than has been the case previously. A much larger proportion of new generation in Australia is in gas-fired peaking plant – a logical response to increases in maximum demand (due to the widespread use of air conditioners). In recent years, investors have responded to rising demand and peak load prices by investing mainly in the construction of peaking plant.

Furthermore, recently a much greater range of companies are investing in cogeneration plant and renewable energy sources. There also appears to be a much greater willingness on the part of private companies to invest in new generation capacity in Australia – with around one half of new investment in the industry coming from private as opposed to government owned companies (though the States of privatisation – South Australia and Victoria – together constitute less than one third of the Australian market).

Transparency is another benefit of reform. Planning documents that were previously only seen within utilities and governments are now published and debated. Investigations of events that lead to price spikes are completed promptly and drive debate about what can be done better.

NETWORK RELIABILITY

Another major fear at the time of reform was that the more commercialised transmission and distribution companies (private and State owned) would under-invest in lines maintenance, and that the reliability of supply would gradually deteriorate. There appears to be no evidence that this has occurred. Indeed, in the case of Victoria (the largest scale privatisation) the system reliability of the private network companies has been superior on virtually all measures to those existing before the reform process occurred (Figure 5).

The main impacts of reform, therefore, have been to raise efficiency in the industry, lower prices, raise returns to owners, and create improved incentives to investors – but, so far, without any significant deterioration in service standards.
GAINS TO THE ORIGINAL OWNERS – THE STATES

Related to the gains to owners of electricity assets is the issue of privatisation. In Victoria and South Australia gains have also been made from the privatisation process.

In Victoria, gross proceeds of the sale of the electricity industry were Aus$23 billion, or Aus$13 billion net after the government paid off debt associated with the industry. Aus$5 billion also came from the sale of natural gas assets and additional smaller sums from other privatisations. In the 1990s, the proceeds of the sales were used to almost entirely retire the debt of the government. This helped to push Victoria’s budget back into surplus. The debt burden on the Victorian government that had existed in the early 1990s had meant it had to restrain spending on services and infrastructure. The lifting of this debt burden meant that gradually, in the late 1990s, it was able to increase expenditure on services and infrastructure. This growth in government service provision can be seen, perhaps most dramatically, in terms of the number of police, school teachers and nurses employed by the State. In the first half of the 1990s, numbers tended to be stable (police and nurses) or to fall (school teachers). From the mid 1990s in Victoria, and in each case, there has been a substantial increase in the numbers employed – the largest increase occurring for nurses employed in public hospitals.

Although this growth in government service provision was facilitated by a range of influences, the sale of the electricity industry was a crucial factor. A similar situation occurred in South Australia (although on a smaller scale) where the government also used the proceeds from privatisation to retire debt. In the other States where governments did not take advantage of asset sales, they still benefited as competition forced companies to achieve higher levels of efficiency returns on money invested. By the late 1990s the State owned electricity companies in New South Wales, Queensland, Tasmania and Western Australia had all become substantial sources of government revenue, whereas returns had been negligible in the 1980s.

The improvement to the budgets of the various State governments has therefore enabled them to substantially increase spending on the provision of services, adding to the social benefits of reform. Taken all together, the gains that have flowed from the reform process have been substantial. But the process has not been entirely without its challenges.

THE CHALLENGES

The process of moving toward a more market orientated industry structure has, by no means, been without its problems. Some of the most important of these are listed below:

- Increasing labour efficiency led to some people leaving the industry. As the industry tends to be highly concentrated – typically in Australia on the coalfields – some towns experienced high levels of unemployment through the restructuring period. Lower levels of employment in the industry have helped to release under-utilised workers into more productive lines of activity, but the process has undoubtedly social costs.

- There has been a degree of instability of ownership of the privatised assets with a number of the original buyers selling out reasonably quickly – for a variety of reasons. Many of the original American and European investors have sold out to Asian or Australian based companies (which perhaps have longer-term investment views). This process still seems to be working itself out, creating some degree of instability in investment.

- The position of government owned assets is still of some concern. Although there are substantial constraints on government intervention, continuing ownership means there is always suspicion that the ‘playing field’ may get ‘tilted’.

- The national market is not an integrated one. Transmission interconnections between the States have historically been limited and progress to augment them has been slower than was originally envisaged. This means that in some sub-sections of the national markets there is a fear that the small number of generation companies have significant market power.
Flowing on from the last point have been the problems with gaining planning approvals for transmission augmentations and the construction of new generator plant. This at times has proved slow.

Finally, the federal nature of Australia’s government has meant that the regulatory structure has been fragmented and (to some degree) unpredictable. The recent establishment of the Australian Energy Regulator is aimed at addressing this. The simple passing of time means that regulators understand their job better and regulated businesses have a body of precedent to help them predict regulatory behaviour. Appeal bodies have helped limit regulatory excess.

None of the above listed difficulties have prevented the creation of the bulk of the benefits from the reform process. They have, however, perhaps helped to prevent the full benefits of reform being achieved.

**The Scorecard**

There is no doubt that the benefits of the reform process have well exceeded the costs. At present, there is no government, State, (and very few citizens) that would envisage returning to the pre-reform structure.

In the States where assets have been privatised, governments in office are far happier using revenues on the provision of social services such as police, teachers and medical personnel rather than having the funds tied up in electricity industry assets. States that have not privatised appreciate the additional revenue (or lesser call on the public purse) that improved efficiency has delivered (and still look, cautiously, for opportunities to privatise parts of their industries - or, at least, new investment).

All this indicates that there is an acceptance that the industry, in its reformed state, is more efficient than the monopoly model that dominated through to the end of the 1980s. That is, the benefits that have been realised since then are greater than the costs.

It should be recognised that public and media perception of the net benefit is more mixed. State owned monopolies had a reservoir of goodwill left from their pre-1970s performance and privatisation remains politically unpopular. Notwithstanding this, public debate and policy making in Australia now revolves around determining the means to making electricity markets operate more effectively rather than there being any question of deconstructing them.

Malcolm Abbott is a Senior Manager with the Economic, Infrastructure and Policy group at KPMG in Australia. Malcolm Abbott is an economist whose main areas of work have been in the development of energy markets, telecommunications and the regulation of pricing and access.

E: mjabott@kpmg.com.au

Graham Holdaway is a Partner with the Economic, Infrastructure and Policy Group of KPMG in Australia. Most of his work in recent years has been on reform of the electricity and gas industries, but he also has experience in water, transport and ports. He has provided financial and economic analysis and advice to governments on energy policy matters in Australia, New Zealand, Korea, Indonesia and Israel.

E: giholdaways@kpmg.com.au

Antony Cohen is a partner of KPMG and Leader of KPMG’s Power and Utilities Group in Australia, including the recently established Australian Water Group. He has lead KPMG’s involvement in the restructuring and privatisation of the electricity and gas sectors in Victoria, South Australia and the UK and has been involved as financial advisor in many major merger and acquisitions and IPOs in Australia and overseas.

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Footnotes

1. In July 2005, the roles and functions of NECA passed to the Australian Energy Market Commission and the Australian Energy Regulator. The former is the body responsible for energy market rule making and market developments. The latter performs economic regulation of the wholesale electricity market and electricity transmission networks in the National Electricity Market (NEM). It is also responsible for the enforcement of the National Electricity Law and National Electricity Rules.


4. In both Victoria and South Australia there has been a change in government since privatisation. In neither case has the incoming government decided to reverse the privatisation decision.

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