

Australian Electricity Market

The objectives of the Australian national electricity market are that it should be competitive, offer customers a choice of generators and retailers, and provide open access to the interconnected transmission and distribution network. It should not present barriers to entry, more or less favorable treatment of new entrants, bias towards a particular energy source or favoritism towards, or impediments to, intra- as opposed to inter-state trade. The core objective of the market rules, set out in the National Electricity Law and regulations and the Code, is to provide a light-handed and market-oriented regime of regulation that in turn allows the market to achieve its objectives.

How far, in the 3 years since the market's launch in December 1998, have the market and the market rules achieved those objectives? The vision we articulated for the market (Figure 1), consistent with those objectives, is of a genuinely open market that delivers electricity efficiently and at competitive prices;

which is safe, reliable and secure; which meets governments' and society's demands and expectations in relation to reliability and security; and in which there is:

- An efficient and economically rational framework
- Provision of clear and rational signals for the timing and location of new investment.

Any report card on the extent to which the market has achieved such comprehensive objectives and fulfilled such a demanding vision will inevitably be mixed. The market can already, in just 3 years, point to substantive and impressive achievements. An independent report on the benefits and costs of electricity reform by the Australian Bureau of Agriculture and Resource Economics (ABARE) estimated that the benefits realized by 2000 are equivalent to an increase in GDP of \$1.5 billion. This represents, already, almost two-thirds of the original total estimated benefits of reform. The same report forecast total benefits by 2010 of \$15.8 billion. The market will never, however, replicate the very low prices of 1997 and 1998 in New South Wales and Victoria. Those prices were anyway artificial, since they relied on both generators' and retailers' ability to blend the spot price with the much higher prices under the then existing vesting contract arrangements.

Governance of the Market

The governance of the market has been more confused and lacking in direction than it had to be. Overriding responsibility for shaping the objectives and future policy development of the market can only rest with the governments involved. The creation of the Council of Australian Governments (COAG) Ministerial Council on Energy and the National Electricity Market Ministers' Forum in June 2001 is intended to fill that acknowledged policy vacuum. The COAG review of energy market directions and action on the priority tasks for the Ministers' Forum offer a real and necessary opportunity

to set new and updated objectives for the next stage of the development of the market.

That fresh direction, once determined, must be implemented quickly and effectively. The current processes for changing the market rules must be improved and streamlined in order to allow this to happen. This must include resolution of the overlapping responsibilities of the Australian Competition and Consumer Commission (ACCC) and the National Electricity Code Administrator (NECA). One approach might be to restructure the market rules into three clear categories:

- Statement of principles and objectives, drawn up by governments and endorsed by the ACCC, which sets the guiding light for the current operation and future development of the market
- Framework for delivering those principles, which would be the responsibility of NECA and the Code Change Panel
- Detailed technical and operational rules set out in schedules to, or entirely separate from, the Code.

A structure along these lines would remove the existing overlap and duplication of processes that has led to widespread frustration and dissatisfaction with the existing arrangements, while, at the same time, retaining the essential involvement and consultation in developing the market rules.

Involvement and consultation in adapting the market rules to deliver fresh impetus to the market must extend to end-use customers. They have often perceived themselves to be excluded from the market's decision-making processes. The changes we have made to those processes, including crucially the creation of the Advocacy Panel and the provision of market-based funding for end-user advocacy, are intended to strike that essential balance.

Network Planning and Regulation

Recognition of the need for a strongly interconnected and closely coordinated national transmission network provided the initial impetus for the work that led to the creation of the market. Controversy has continued to rage, however, around the role of the transmission network and around the regulatory and incentive framework within which transmission and distribution network service providers should operate as the sole remaining regulated monopolies within an otherwise competitive market.

The role of the transmission network is currently being addressed as part of a study commissioned by the National Electricity Market Ministers' Forum. We believe it is inherent in the fundamental design of the market that regulated transmission networks will remain the predominant model, certainly for the foreseeable future. This does not preclude, however, a continuing and potentially expanding role for merchant links. They too were clearly envisaged as part of the original market design. Australia has led the world in developing a framework for the market operation of merchant links. Directlink is already in operation; Murraylink is well advanced; we recently published a framework for the operation of Southerlink, which will be the first hybrid (part regulated, part merchant) link in the market.

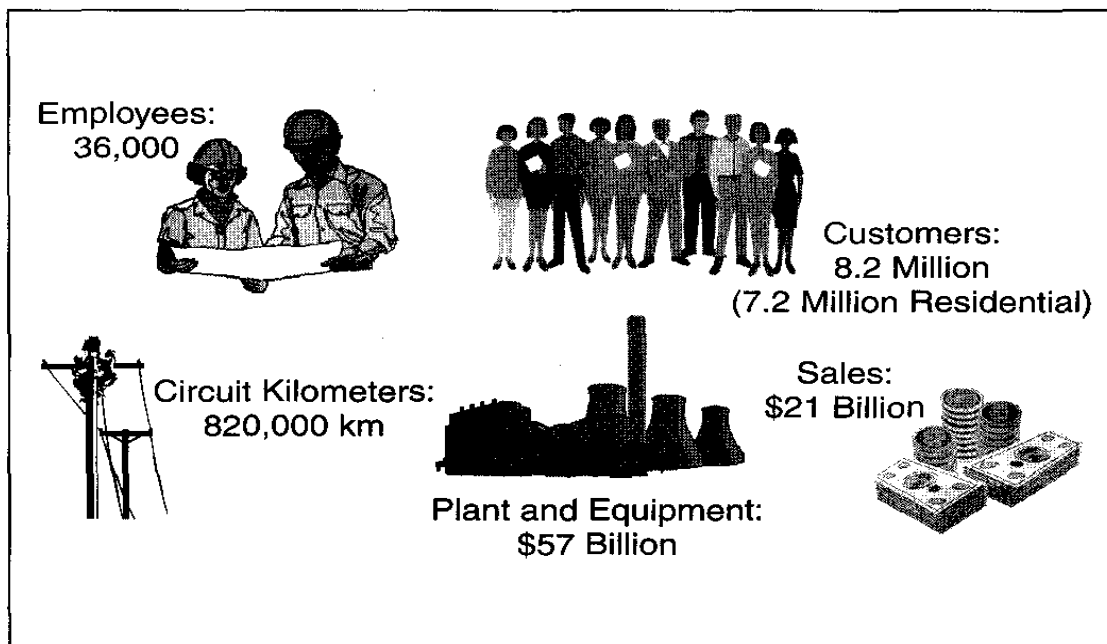


Figure 1. Vital statistics of the Australian electricity market

Our joint statement with the ACCC in June 2001 set out three aims intended to inform a consistent resolution of the framework regulatory and incentive issues surrounding the treatment of networks. Those aims are to:

- Establish a stable framework for essential new investment in regulated and unregulated interconnectors in order to meet the fundamental objective of enabling capacity and reserve to be shared market-wide
- Provide a consistent basis for network pricing that will give improved signals for essential new investment and ensure that the costs of that investment are met by those who benefit from it
- Work towards closer integration of the energy market and network services.

Significant work is already in hand to achieve the first of those aims through:

- Encouraging a genuinely national market-wide approach to the planning and strengthening of the transmission network. The Reliability Panel has recommended a number of refinements further to improve the National Electricity Market Management Company's (NEMMCO) annual Statement of Opportunities in order to make it more valuable as a planning document and as a resource for identifying and assessing the need for new network investments. The market rules will also shortly be changed to require the Statement of Opportunities to be supplemented by annual planning reports by each transmission network service provider that will, among other things, provide forecasts of future constraints and detailed disaggregated information about proposed new investment projects. Annual distribution network utilization plans would further develop this information and planning base.
- Streamlining the approval process for new regulated network investments. The existing

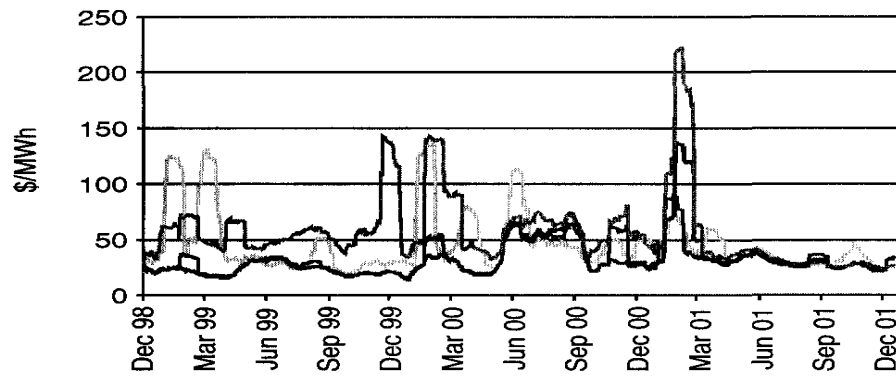
arrangements are confused and time-consuming. Our revised proposals, endorsed in principle by the ACCC, will put in place a streamlined process with the proponent network service provider clearly in the driving seat but incorporating appropriate checks and balances including the need for ACCC approval for major new investments. This would replace the existing arrangements for the Inter-Regional Planning Committee (IRPC) and NEMMCO approval of individual projects.

The ACCC has also committed itself to a review of the regulatory test for new network investment. We have urged that the review should consider the following key issues:

- A means of enabling the test to capture downstream customer benefits as a result of a new link
- Determination of whether it is really appropriate for a new link to be required to maximize market benefit or, less stringent, to achieve a benchmark net present value.

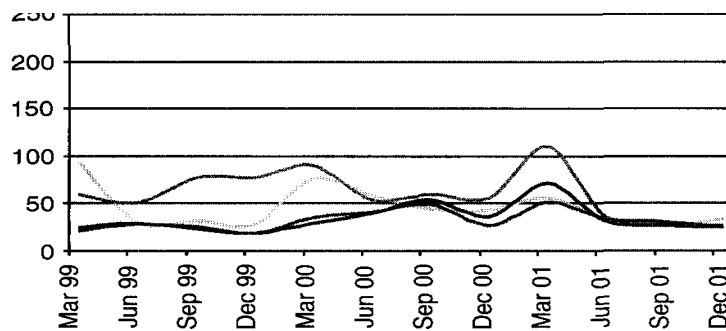
A consistent basis for network pricing, the second of the aims set out in our and the ACCC's statement, is also crucial to supporting essential new investment both in the networks themselves and in new generation. *Beneficiary pays* for new investment, now accepted by the ACCC, will resolve the current mismatch between those who benefit from new network investment and those who pay for that investment. It will help foster more efficient investment and better locational decisions. Along with the outcomes of other components of our transmission and distribution pricing review, it will also ensure a fairer regime for new investment in embedded generation. We will commence work shortly on a detailed methodology to implement *beneficiary pays*. We will also, at the request of the ACCC, begin in consultation with market participants and others to develop a modified regime of transmission pricing consistent both with *beneficiary pays* and with the closer integration of network pricing into the energy market.

Achieving that closer integration, in relation to pricing but also more widely, is the third of our and the ACCC's joint aims. Key to that aim is securing firmer access to *the* networks, including by re-examining the potential for financial transmission rights and better identifying and managing the market impacts of transmission constraints and outages. The potential scale of those impacts was underlined most recently by the price spikes in the recently introduced ancillary services markets that coincided with the network outage in northern New South Wales. The development of a performance-based regulatory regime that aligns the incentives and outcomes for transmission network service provider with the needs of the market and end-use customers was one of the key recommendations of our review of the scope for integrating the energy market and network services. We welcome the transmission network service providers' (TNSP) adoption of this principle as part of their recently published cooperation charter. We look forward to working with them and the ACCC on the development of that regime. We are also committed to return to the other key element of our integration review, a refined regional structure for the market, in the light of NEMMCO's current review of the existing structure.



Queensland • South Australia • Victoria • New South Wales

(a)



• Queensland • South Australia • Victoria • New South Wales

(b)

Figure 2. Spot prices: (a) 28 day; (b) 3 month, rolling average

Spot and Contract Markets

Any assessment of the spot and contract markets must begin with price. In the first year of the market, annual average spot prices were reduced from \$60 to \$52 per MWh in South Australia and from \$46 to \$38 per MWh in Queensland. Since market launch, these prices represent reductions of 13 and 18%, respectively. Spot prices in New South Wales and Victoria have increased from the artificially low levels at the start of the market and are now fairly closely aligned with Queensland at \$39/MWh. Within these broader trends, the market was placed under extreme stress, which was reflected in prices in the summers of 1999-2000 (coinciding with industrial action by generators in Victoria) and 2000-2001 as a result of very high summer temperatures.

The actual price paid for the bulk of electricity, however, is mainly determined by contract (rather than spot market) prices and the net effect of participants' contract and spot market exposures. The financial market has not developed as rapidly as the physical market. Nonetheless, the range of contract

market products has grown, and the liquidity and depth of the contract market has improved since the launch of the market (Figure 2). The total volume of energy market contracts traded in 2000-2001 was more than half as much again as in 1999-2000. Prices in the contract market have also become more transparent. Flat rate contract prices currently vary between \$34 per MWh now and \$43 per MWh for 2005. A key role of the financial market is to manage the risks inherent in the essential volatility in spot market prices. Those contract prices have already discounted the planned increase in the price cap in the spot market from \$5,000 to \$10,000 per MWh from April 2002.

New entrant prices are widely accepted as the benchmark for long-term efficient prices. On that basis, current spot and contract prices compare with an estimate of the range of new entrant prices we commissioned from BumVoor Partners of \$34-45 per MWh.

A properly functioning overall market relies on a deep and active contract market (Figure 3) alongside the spot market and on a close and dynamic relationship between spot and contract prices. Key to further development of the contract market, and in particular to minimizing the risk premium that is applied to those contracts, is to retain the national integrity and further improve the broader efficiency of the overall market arrangements. The closer integration of networks, and especially managing their effects on the market, is also crucial to that further development. A fully-fledged contract market also needs to be able to integrate off-market, and most importantly ancillary services, arrangements. The new ancillary services arrangements faced a difficult introduction when prices spiked to over \$4,500 in response to a network outage in northern New South Wales and generation outages in Queensland in October.

The market rules also provide for off-market, bilateral contracts between generators and end-use customers, or so-called settlement reallocation. There is valuable scope for much wider use of that facility, including to net-off exposure in the settlement process. Some argue for radical reform that would replace the existing market arrangements with a wholly contract model. The benefits of such radical change, however, in particular for small and medium-sized industrial and commercial customers who make up the bulk of the economy and for residential customers, are not proven. A predominantly contract model would significantly reduce price transparency. Moreover, the key alleged advantage of a contract market model that it would reduce supply-side market power is not borne out by the experience of the new electricity trading arrangements (NETA) in the U.K., where the Office of Gas and Electricity Markets (OFGEM) remains concerned about what it perceives as widespread abuse of generator market power.

The market is delivering significant new investment in generation, including in crucially needed new peaking plant. Committed and projected new investment projects currently being debated total 10-10,500 MW. Most of that new investment is privately financed. The lead times for that new investment have also reduced considerably compared to the past. The planned increase in the price cap has been an

important factor in bringing forward at least some of those planned new investments. Not all the prospective new investment will materialize in the short to medium term. This and more, however, eventually will be needed to meet demand that is forecast to grow by almost 4,000 GWh a year at least up to 2010 and peak demand that is growing even faster. Nonetheless, the market is signaling that it is currently comfortable with the rate of new investment. It remains essential that there continues to be an adequate flow of new investment and in particular that sovereign or regulatory risk is not allowed to jeopardize that flow.

The growth in demand-side participation on the other hand, although no less essential, is much less encouraging. Price-responsive demand is vital both to encouraging the sort of vigorous demand-side participation that is essential to ensure a genuine two-sided market in which customers are not simply price-takers and to enable customers actively to manage their demand during high-priced peak periods. The potential prize is significant. U.S. estimates suggest that a 5% managed reduction in peak demand can reduce the cost of servicing that peak by up to 50%. There are signs of increasing demand-side response, and the market rules have been changed to facilitate that response. Much more, however, needs to be done. This includes exploring the scope for providing a framework for aggregators within the market rules and improving demand and price forecasts.

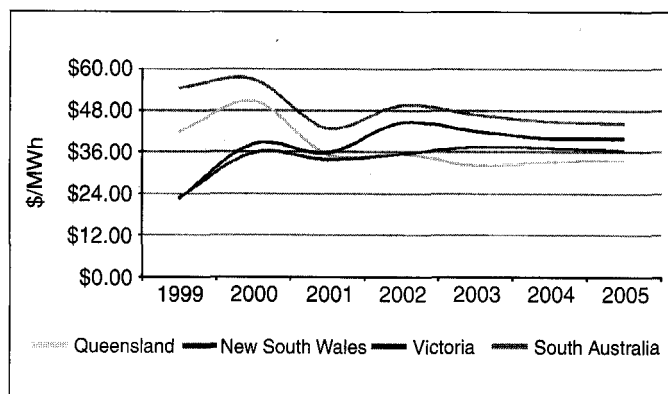


Figure 3. Contract market prices

Demand-side participation can also help to redress the supply-side market power that exists in the Australian and all other electricity markets world-wide. The ACCC is currently considering whether to conduct an investigation under the Trade Practices Act into the extent, and extent of exploitation, of that market power. We do not believe that there is widespread or systemic abuse of either the bidding and rebidding or other provisions of the market rules. We have, however, identified some specific instances where the current incomplete state of development of the market and the lack, therefore, of a fully competitive outcome have resulted in prices that have given cause for concern. Our proposed prohibition on bids or rebids that materially prejudice the efficient competitive or reliable operation of the market is targeted at those abuses. The National Electricity Market Ministers' Forum is considering increasing the fines for breaches of that proposed prohibition to up to \$ 1 million. We are also

continuing to strengthen and improve our surveillance, monitoring, and enforcement capabilities to enable us to identify and tackle those and other potential abuses.

A range of initiatives have either been taken or are in various stages of development to improve the operational efficiency of the spot market arrangements which, as we stressed earlier, is also key to a vibrant contract market. We have, for example, moved to integrate government-imposed restrictions, where they are deployed, into the market mechanisms. Key areas for further development include in relation to improving forecast information; resolving the anomalies between a 5 minute dispatch and 30 minute settlement cycle; refining the treatment of network losses and constraints, some of which can currently discriminate in favor of intra-regional trade; and the work NEMMCO is currently doing following our report on price spikes on the impacts of transfer limits on interconnectors and short-term loading constraints.

Reliability and Security

Society legitimately holds high and increasing expectations about the reliability and continuity of supply of electricity. With only very few exceptions, predominantly as a result of industrial action in Victoria, the market has consistently delivered uninterrupted supply to meet customer demand. The security of the power system has also been maintained, without exception, since market launch.

NEMMCO's latest statement of opportunities forecasts continued adequacy of supply in Queensland and New South Wales all the way to the end of the outlook period in 2010-2011. The planned enhanced link between the Snowy and Victoria, and the New South Wales and South Australia interconnector, both recently approved by NEMMCO, will significantly improve the outlook for Victoria and South Australia.

The Reliability Panel has deliberately adopted a still-prudent but increasingly market-oriented approach to ensuring the continued reliability and security of the system. The revised frequency standards the panel introduced in September 2001 for the first time provide the opportunity to introduce economic criteria into their application and, in particular, will allow NEMMCO to act as a *smart buyer* of ancillary services.

The basis on which the performance of the market in terms of reliability and security will be judged, however, is on end-to-end supply chain reliability. There is currently no consolidated whole-of-industry reliability measure. There should be.

The Reliability Panel intends to work with the states, the ACCC, and the jurisdictional regulators to develop consistent market-wide measures aimed at facilitating comparisons within and across sectors and at enhancing the quality of resource allocation decisions.

Priorities for Further Work

The forum we held to launch our assessment identified seven key priorities for further work:

- Transmission and, in particular, interconnector planning, regulation, and pricing
- Need for firmer access, including through providing appropriate incentives for transmission network service providers and by firming-up the settlement residue auction products
- Demand-side participation in the market
- Efficiency improvements in the operation of the market, e.g., the introduction of *soft* constraints and 5-minute predispatch and the revision and simplification of constraint equations
- Level of the price cap in the spot market and related issues, e.g., for remunerating peaking and reserve capacity
- Closing the loop between the physical and financial markets
- Streamlining the Code change process and simplifying the Code itself.

This list aligns very closely with the priority tasks of the National Electricity Market Ministers' Forum. This report described changes made, or work in hand, in each of those areas.

The single most important challenge currently facing the market, however, is the introduction of full retail competition. The ABARE report on the benefits and costs of electricity reform concluded that the largest gains from the introduction of retail competition will come when customers can adjust their behavior in response to real-time prices.

About the Author

Stephen Kelly came to Australia in November 1995, initially on secondment from HM Treasury to NSW Premier's Department. He immediately became involved in state and national electricity market reforms. He joined the National Electricity Code Administrator in September 1996 and became its managing director in January 1998. He was appointed in January 2000 as a member of the ministerial enquiry into the New Zealand electricity industry. The government subsequently accepted the key recommendations of the enquiry's report. In the U.K., he was a member of the HM Treasury team responsible for the privatization of the 10 regional water authorities in England and Wales, the 12 regional electricity companies, National Power and PowerGen, and Scottish Power and Scottish Hydro.