Mr Ed Willett, Commissioner, ACCC and Member, AER

APP Energy Regulatory and Market Development Forum

Inaugural Forum Conference Meeting

27 June 2008

Country Information Presentation – The Australian Experience

Opening remarks

There are few more topical issues today in world affairs than energy. Together with water and communications, these areas will dominate the political and social landscape into the foreseeable future.

The creation of this forum brings with it the opportunity for policy makers from all of the countries involved to share ideas, issues and potential solutions to the shared challenges we all face together. It is a privilege to be able to share the perspective of the Australian Energy Regulator with you all this morning.

Energy market reform is not an event, it is a process of continual evolution. Regardless of all the reforms that Australia has put in place, there is still work on the energy reform agenda.

There has been substantial transformation across the Australian energy sector since the mid 1990s. The sector has been significantly restructured. Where a single government-owned business used to generate, transport and sell electricity, there are now competing generators and retailers, with specialist businesses running the transmission and distribution networks. The gas industry has undergone similar structural changes. Whilst there is a degree of government ownership in the electricity sector, competitive energy markets with a more national focus have developed, most notably with the establishment of the National Electricity Market (NEM). Access regulation has been introduced for the transmission and distribution sectors along with a range of regulatory institutions.

It is widely recognised that as a result of these changes that the electricity and gas industries perform far better now that they did previously. There has been significant investment in the energy sector, combined with improved productivity and stable reliability. Major new energy resources have been developed and new energy technologies employed.

There are also some significant challenges on the horizon. Common with many other countries, clean energy targets and emissions trading will create new challenges for the energy sector. From our perspective, the Australian market is well placed to deal with these challenges while maintaining reliability. However, clean energy targets may pose some significant issues for the development of Australia's energy networks.

In my presentation, I will detail the Australian experience of energy market reform. In addition, from our position as the watchdog of the national electricity market, I will discuss how well the market is placed to address the market's future challenges.

The most recent chapter of the energy market reform story gave birth to two new agencies, the Australian Energy Market Commission and the Australian Energy Regulator.

A central focus of energy reform policy in the past three or four years has been the development of a single national regulatory framework. The creation of both the AEMC and the AER is the cornerstone of this approach.

The AER is assuming responsibility for the economic regulation of the national energy sector on a staged basis. We have been the regulator of the wholesale market and transmission networks in the NEM since July 2005. The transfer of regulation of electricity distribution networks, gas pipelines and some retail functions from the states to the AER is scheduled to be completed by January 2010.

In undertaking our role, we are guided by the objectives set out in the national electricity and gas legislation, which are to promote efficient investment in, and efficient use of, electricity and gas infrastructure services for the long term interests of consumers of electricity and gas with respect to price, quality, reliability and security of supply and the reliability, safety and security of the national energy systems.

In the electricity wholesale market, the AER monitors the compliance of participants with the National Electricity Law and Rules, and prosecutes breaches.

Generally, we seek to work co-operatively with market participants to help them understand their obligations under the legislation and to develop appropriate compliance programs, resorting to sterner enforcement action when necessary.

The AER reports on weekly market activity, unusual incidents and extreme price events. We have also started publishing a major annual report on the state of the energy market as a whole. This report covers the wholesale and forward markets for electricity, as well as the networks, retail and gas markets.

We regulate electricity transmission and distribution networks under a detailed framework set out in the National Electricity Rules. The approach is to determine a revenue or price cap for each network, based on what is necessary to cover efficient costs, while providing for a commercial return to the owner.

Gas pipelines will be regulated under the new National Gas Law and Rules. This is a new function for the AER which will involve the setting of benchmark tariffs to cover efficient costs. In both electricity and gas there are regulatory incentives for efficient investment and operating expenditure. There is also a service standards incentive scheme for electricity networks to ensure that efficiencies are not achieved at the expense of quality.

When all the required legislation is in place, the AER will be responsible for regulating over 40 nationally significant businesses. At the peak of our work program in 2010, the AER will simultaneously review around 12 network businesses.

Structural reform

From the early 1990’s, Australian governments embarked on a series of reforms to establish a competitive energy sector.

The starting point in all jurisdictions was an integrated electricity utility. The first step in the reform process was structural reform – separating potentially competitive functions from monopoly infrastructure, and establishing a competitive industry structure for commercial functions. Each jurisdiction split up generation into several businesses; established transmission businesses; and created several retail/distribution businesses, with ring-fencing between the distribution and retail functions.

The jurisdictions participating in the National Electricity Market undertook structural reform in differing ways. In Victoria, Queensland and New South Wales, the retail and distribution sectors where horizontally disaggregated. However, in South Australia the retailer and distributor was sold as one vertically integrated entity, with the retailer then being on-sold to another entity. In the generation sector, all jurisdictions undertook some form of horizontal and vertical disaggregation. Only Victoria and South Australia privatised these entities. New South Wales, Queensland and Tasmania retained government ownership of all elements of the supply chain. However, in late 2006 – early 2007, the Queensland Government sold its electricity and gas retail businesses. The New South Wales Government has also announced plans to lease its generation assets and sell its retail businesses.

The different manner in which jurisdictions undertook structural reform enables us to draw some conclusions around the relative importance of horizontal and vertical integration, which I will come to a little later.

The introduction of competition required the development of a wholesale market. The National Electricity Market (NEM) began operating as a wholesale market for the supply of electricity to retailers and end-users in Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia in December 1998. In 2005, Tasmania joined the NEM.

The NEM operates on the world's longest interconnected power system – from Port Douglas in Queensland to Port Lincoln in South Australia – a distance of more than 4000 kilometres. Up to $7 billion of electricity is traded annually in the NEM to meet the demand of the almost eight million end-use consumers.

Wholesale trading in electricity is conducted as a spot market where supply and demand are instantaneously matched in real-time through a centrally-coordinated dispatch process. Generators offer to supply the market with specific amounts of electricity at particular prices. From all offers submitted, the market operator (NEMMCO) determines the generators required to produce electricity based on the principle of meeting prevailing demand in the most cost efficient way. These generators are then dispatched into production.

Prices are set every half hour for each of the regions of the NEM. The maximum spot price is $10,000 per megawatt hour. Trends in spot price movement are designed to provide signals for future investment in generation and network capacity in the NEM. As the capacity of available generation to meet demand diminishes, relative scarcity will lead to dispatch of higher cost generators and an increase in the spot price, and new generation or network capacity will be attracted into the market.

If we turn our attention away from the east coast, 3,500 kilometres west from where we are now, Perth is the centre of the Western Australian market.

The energy reform story in Western Australia is similar to that of the east coast states, beginning with completely integrated entities, through to disaggregating into separate elements of the supply chain.

With a customer base spread over a third of the national landmass, Western Australia's electricity industry faces some unique challenges. State-wide, around 60 per cent of installed generation capacity is fuelled by natural gas, 35 per cent from coal and 2 per cent from oil. Gas is used in base load cogeneration plants and peaking units.

In September 2006, Western Australia launched a wholesale electricity market for the south west interconnected system. In this market, energy trading is facilitated through a combination of bilateral contracts, a day-ahead short-term energy and a balancing market. The market was designed to suit Western Australian conditions and differs considerably from the setup on the east coast.

The Western Australian market includes both an energy market and a capacity market. The capacity market is intended to provide incentives for investment in generation to meet peak demand. In particular, it is intended that the capacity market will provide sufficient revenue for investment without the market experiencing high and volatile energy prices.

The system operator determines how much capacity is required to meet peak demand each year and allocates the costs of obtaining the necessary capacity to buyers—mostly retailers. Generators are assigned capacity credits, which entitles them to payments for offering their capacity into the market at all times. These payments are intended to cover the fixed costs of an open cycle peaking gas turbine and will partially cover the capital costs of base load units.

In the NEM there is no capacity market. Instead, generators are paid only for energy sent out, and a high price cap provides incentives for participants to contract, invest in generation and establish demand side responses.

Outcomes of the reform process

So what have been the outcomes of the reform process?

The reform process has led to lower electricity prices overall. Between 1990-91 and 2005-06, real prices fell by 15 percent. Households have experienced an average 4 percent increase, while businesses had an average 23 per cent real reduction in price. The benefit to households has been the flow-on effects of cheaper energy costs on prices generally.

This has been accompanied by substantial new investment. Five thousand megawatts of electricity generation capacity was installed in the NEM between 1999 and 2006 — enough to meet peak electricity demand for the whole of South Australia and Tasmania, with another 1600 megawatts committed for construction by the end of this year. The strongest growth in generation capacity has been in Queensland and South Australia, where capacity has expanded by over 30 per cent since 1999.

There is a similar picture for the electricity networks. Annual investment is running at around $700 million in high voltage electricity transmission infrastructure and $3 billion in the local distribution networks. Across the networks, real investment is forecast to rise by around 40 per cent in the five years to 2007 – 08, driven largely by transmission network expansions and upgrades. Real transmission investment is forecast to rise by around 80 per cent over this period.

Strong investment is occurring in an environment in which the regulated revenues of network businesses are rising and network reliability is being maintained. The generation and transmission sectors have caused very few power outages since the NEM commenced.

NEM jurisdictions have generally achieved high rates of transmission reliability. In 2003–04, there were fewer than 10 minutes of unsupplied energy in each jurisdiction due to transmission faults and outages with New South Wales, Victoria and South Australia each losing less than three minutes. The networks again delivered high rates of reliability in 2004–05. Much of the volatility in Tasmania's data can be traced to a single incident in 2001. This suggests that the reliability of Australia's transmission networks is generally so high that a single incident can significantly alter measured performance.

There has also been significant investment in the gas industry. Development expenditure in the petroleum industry increased four fold from 2002 to 2006. Coal seam methane has emerged as a significant new source of gas and is increasing competition in the gas production sector. It already meets over 60 per cent of Queensland's total gas demand and is growing rapidly, in size and value.

New gas basins and fields are being developed, often in conjunction with the construction of new transmission pipelines to ship gas to markets. For example, the development of Victoria's Otway Basin was followed by the construction of the SEA Gas Pipeline in 2004, which ships the gas to South Australian markets. Australia's gas transmission pipeline network has almost trebled in length since the early 1990s. Around $2.5 billion has been invested in new gas transmission pipelines and major expansions since 2000.

Much of this investment is in long-haul pipelines that have introduced new supply sources and improved the security of gas supplies into markets in south-eastern Australia. Sydney, Melbourne, Adelaide and Canberra are now each served by at least two transmission pipelines, each of which ships gas from a different basin.

The energy retail sector is also being transformed, with millions of customers now free to choose their energy supplier. With the introduction of full retail contestability in Queensland on 1 July 2007, all customers nationally are eligible to choose their natural gas supplier and similar arrangements for electricity apply in New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory. While the maturity of retail competition may vary between jurisdictions there is evidence of consumers taking advantage of competitive offers. By December 2006 in Victoria, the number of small customer switches from one retailer to another exceeded 60 per cent of the underlying customer base.

While it is still too early to assess the outcomes of the Western Australian energy market, a number of developments can be observed. The number of market participants is increasing, with new retailers and generators entering the market.

Recent market developments

Since early 2007, the NEM has experienced a series of extreme price events. These prices have also flowed into historically high prices in the forward market for derivative contracts.

In a country the size and spread of Australia, the reasons for changes in prices from one state to the next can be diverse. For instance, price spikes in Victoria and South Australia in January 2007 occurred as a result of a bushfire cutting off access to the interconnector from New South Wales.

The main cause of high prices in April and May 2007 was that the drought constrained hydro-generating capacity in south eastern Australia. The drought also limited the availability of water for cooling in some coal-fired generators, especially in Queensland. In combination, these factors led to a tightening of supply and higher offer prices by generators.

While drought may have caused some of the higher prices, it was flooding in Hunter Valley region of NSW that caused a number of generator outages, network outages and generator limitations. Tight supply was accompanied by record electricity demand as cold winter days increased heating requirements. In combination these factors led to an extremely tight supply-demand balance during the early evening peak hours, particularly in New South Wales. At times, the impact of tight supply conditions on prices were substantially amplified by opportunistic base-load generator bidding.

In 2008, prices have spiked in Queensland, Victoria and particularly in South Australia. In South Australia, the bidding strategy of one participant combined with network limitations and an extreme heatwave (where the temperature was above 35 degrees for 15 consecutive days) caused the highest prices we have seen in the NEM since the market started in 1998.

In the short term, higher prices are a normal response to tight supply in a competitive market, and provide signals for new investment in generation capacity. A scenario of persistent high prices above new entrant costs — without a sufficient investment response — would raise serious market power concerns, particularly if opportunistic bidding by base-load generators is a substantial factor. The AER closely monitors the market and reports weekly on wholesale and forward market activity. It also publishes more detailed analysis of extreme price events.

Emergence of generation –retail integration

In recent times, we have also seen a pronounced change in the electricity industry – the emergence of integrated generator – retailers.

The original design of the NEM was based on structural separation of generators from retailers. This separation of generation from retail meant that active hedging markets would be required to manage spot market risk in the often volatile energy only market design.

This model encouraged liquid contract markets and established an open market to enable retailers and generators to manage their risks. Structural separation between generation and retailing was also seen to help minimise barriers to entry of retailers and generators, consistent with COAG's objectives for the industry, and in turn encourage strong competition particularly in the retail markets.

However, as I outlined earlier, some jurisdictions retained common government ownership of generation and retail, albeit in separate corporate structures. In addition, since the initial reforms in the 1990s, significant vertical integration has occurred in Victoria and South Australia. AGL purchased a 35% stake in the Victorian Power Station Loy Yang A in April 2004, CLP purchased TRUEnergy's retail and generation assets in mid 2005, and in 2007 AGL acquired Torrens Island, South Australia's largest power station.

Two of the three dominant retailers in the Victorian and South Australian markets are now substantially integrated (AGL and TRU). The third major retailer, Origin, also has peaking plant and has announced plans to build base load plant in Victoria.

On the positive side, vertical integration allows improved risk management for the integrated entities, as integration can be used by retailers to mitigate the risks associated with generator market power by providing a natural hedge against spot market volatility. In addition, it reduces transaction costs, such as costs associated with trading and managing prudential positions.

However, costs may also arise if there is a significant loss of liquidity in hedge markets as integrated retailers hedge risks internally. That is, the more vertical integrated the market becomes, the less players there are in the contract market seeking to manage their risk. Effectively, this could become a barrier to retailers entering the market as standalone players. This has happened most notably in New Zealand, where dominant regional generator-retailers have emerged, rendering stand alone retail entry very difficult.

The experience in Australia to date appears to show that vertical integration, in and of itself, is not necessarily anti-competitive, but does pose some risks to competition. In Victoria there are three competing integrated generator-retailer players and a fourth, largely independent generator. Competition between the three gentailers and the ability of the independent generator to offer contracts to independent retailers, means that outcomes to date have been positive for household consumers, with a recent review of the competitiveness of the retail market finding the market to be effective.

However, the situation is of more concern in South Australia, where contract liquidity is more limited and anecdotal evidence suggests that it is hard for new entrants to gain a foothold in the market. The AEMC is currently reviewing the competitiveness of the South Australian retail market.

Meanwhile, over the last twelve months, large electricity users have expressed serious concerns about large price increases, and much reduced availability, in long-term supply contracts throughout the national market

It is therefore hard to draw firm conclusions about the effect of vertical integration. However, it is clear that the key to a competitive market remains competition at the horizontal level, in both generation and retail sectors, and the ready availability of supply contracts to retailers and large users.

Future challenges

I will now turn to the future challenges that Australia faces, particularly as we move to a carbon constrained economy.

There is no doubt that the most significant challenge for the Australian energy sector relates to carbon emissions and the need for the NEM to respond effectively to related policy. Currently coal provides some 75 percent of Australia's total generation capacity, with a further 15 percent met by natural gas. These two forms of generation are the cheapest of the main alternatives. Any change away from these will, by definition, involve an increase in the cost of supply.

If we compare these costs with the greenhouse gas emissions intensity from the generation sources, Australia faces some significant future challenges in a carbon constrained environment.

In total, stationary energy contributes about half of Australia's total annual greenhouse gas emissions. Australians will be looking to the energy sector for a substantial greenhouse gas emissions saving.

Central to Australia's plan to tackle climate change, is the introduction of an emissions trading regime, scheduled to begin from 2010. The initial views on the likely form of the trading regime are going to be released by Government in the coming months in the form of a green paper.

In addition to the creation of an emissions trading regime, the Government has also committed to a target of sourcing 20 percent of Australia's electricity generation from renewable sources. The "20 percent by 2020" target will pose significant issues for the development of Australia's energy system.

While the establishment of an emissions trading scheme and the enhanced renewable target pose challenges, the design of the National Electricity Market is a key strength in finding the most efficient response. The gross pool model allows the environmental externalities to be internalised, in the form of the cost of a carbon permit, with this added to the short run marginal cost bid of a participant. The market will continue to be dispatched in merit order, with the environmental externality cost included in bid prices.

Of course, the final effect on the merit order will be determined by a combination of factors including the future carbon price and the cost of fuel. However, it is the fundamental design of the market that will be central in allowing the most efficient response to be found, in a carbon constrained environment.

In the short term, the establishment of a price on carbon is likely to accelerate the development of natural gas — which as we've seen, has lower carbon emissions than other fossil fuels.

It is clear that with rising demand for gas on the east coast, particularly with potential LNG facilities in Queensland, it is likely that there will be increases in the delivered gas price. The extent to which the gas price will increase is not clear. In turn, this means that it is not clear what the level of switching in the generation fuel mix from coal to gas generation will be. However, Australia's national electricity and gas markets are well placed to provide appropriate signals for the commissioning of new plant.

In the longer term, carbon emission pricing policies, together with regulation such as energy efficiency requirements and research and development will create the potential for a wider range of low carbon emission technologies. These might include clean coal and renewable energy sources that are not currently cost effective. Australia's national electricity and gas market frameworks, in conjunction with appropriate environmental policies, provide a flexible basis for the adoption of efficient low-carbon energy sources and technologies.

Into the future there will be more investment proposals planned for strategic locations that are actually poor locations in terms of network efficiency. By strategic I mean, generation that is to be located either for a gate keeper role in relation to inter-regional flows or due to primary fuel source location.

Similarly, with more gas fired generation likely to be constructed, there will be a need to co-optimise the availability of gas and electricity networks. For instance, in the medium to longer term, it is likely to be efficient for gas fired generation to locate in the La Trobe Valley to take advantage of the strong existing network.

At present there are only weak signals for generator location within the electricity network. This is a significant issue which if not addressed could lead to significant distortions in incentives for the efficient location of new generation. There is a need to ensure that generators see some form of price signal with regard to locating within the electricity network. Further, there is a question whether new generation technologies should meet the entire costs of necessary network enhancements if the cost of the legacy network is not met by legacy generators.

With this in mind, the Ministerial Council on Energy has recently indicated that it will be directing the AEMC to conduct a review of the energy market framework to determine whether amendments are needed to accommodate the introduction of climate change policies. This will have particular regard to the planned implementation of an emissions trading scheme and enhanced MRET.

Whilst these issues are material and must be addressed to ensure that Australia meets the significant future challenges in the most efficient manner possible, we consider that the fundamental market design to be appropriate.

As I have highlighted, the energy market reforms that Australia has undertaken have left us with a robust system, which is encouraging the right forms of investment, at the right time.

The market model and regulatory regime for networks are well placed to assist in the efficient transition to a carbon constrained world.

Concluding remarks

The energy sector has undergone a remarkable transformation since the commencement of its reform in the mid-1990s. The reforms have been a major success, with both the electricity and gas industries performing far better now than they did previously. Significant challenges are on the horizon with clean energy targets and emissions trading. The reforms that have been undertaken in Australia generally have left us in a strong position to meet these challenges.