Strategic Priorities for Energy Market Development

DISCUSSION PAPER

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John Pierce CHAIRMAN

I am pleased to present the AEMC's first Strategic Priorities Discussion Paper for comments from those of you with an interest in the Australian energy sector. As the body responsible for advising the Ministerial Council on Energy, I believe it is important that the AEMC explains its views on the most important challenges and opportunities for market development in this country.

We are looking to develop a well-informed debate on what really matters in terms of priorities for market design and the delivery of affordable, reliable and secure energy for the whole community. As consensus builds around those priorities for market development work in the Australian energy sector we will structure our work programme to help address those priorities.

We have identified three strategic priorities to address the challenges facing the Australian energy sector.

- Our first priority recognises the need for unprecedented investment in generation capacity over the next decade to maintain reliability and security of supply, to meet rising peak demand, to respond efficiently to government climate change policies and enhance competition.
- Our second priority focuses on the need to facilitate the expansion of cost effective consumer choices and improve energy efficiency.
- Our third priority complements our focus on generation investment by helping to ensure that the arrangements for investment decisions, funding and pricing for the use of the transmission network are well thought through and will contribute to our objective to help minimise the overall costs of transmission and generation.

We look forward to receiving your views on our thinking. Over the coming year we will work with all our stakeholders – industry, community representatives and Federal, state and territory governments to deliver the AEMC's strategic work programme. We will continue to work in close consultation with you – especially those in industry who have the closest day to day working relationships with households and businesses – and who carry such a large share of the responsibility to deliver better outcomes for customers in the years ahead.

We will continue to monitor and analyse developments in the Australian energy sector and re-evaluate our work programme priorities on an annual basis. Your participation in active engagement with us is welcomed and valued – we need to understand your views on market development issues and we offer you the opportunity to help shape our thinking on how best to address options, and alternatives, for Australian energy markets at this watershed in the sector's history.

John Pierce
CHAIRMAN

Your participation in active engagement with us is welcomed and valued – we need to understand your views on market development issues.

Summary

Over the last decade there have been major changes in the Australian energy markets. The reform programme that created the National Electricity Market (NEM), and subsequently the emerging national gas market, has delivered substantial benefits to customers. These benefits included more competition, continued strong investment and reliable supply.

Nevertheless, the energy sector faces major new challenges with significant increases in transmission and distribution costs, and hence retail energy prices in recent years, expected major changes to the generation mix, and further price increases as a result of policies designed primarily to address climate change concerns.

Energy markets in Australia continue to change rapidly. In the electricity sector, the New South Wales Government has recently sold a number of its main energy sector businesses, an expanded Renewable Energy Target (RET) came into effect on 1 January this year and the Prime Minister's Task Group on Energy Efficiency has recommended a range of measures it believes will deliver a step change in the take-up of energy efficiency measures in Australia.

In the gas sector, plans are well advanced to extend the Short Term Trading Market (STTM) through a Brisbane hub in 2011, building on the hubs that have recently been implemented in Adelaide and Sydney and the evolving Victorian declared wholesale gas market. The development of more gas fired generation will also increase the interactions between the gas and electricity markets.

Emerging Challenges

Despite the achievements of the reform process so far there remain significant challenges for the energy market in the future.

Australia is putting in place policies to tackle climate change, such as the expanded RET and the Federal Government's intended price on carbon emissions, within one of the most liberalised energy markets in the world. This increases the importance of making sure that the measures to address climate change are well designed so that they do not adversely affect the economic efficiency of the energy sector or the ongoing development of competition in generation and retail markets.

Well designed measures to address climate change can use the incentives within the competitive wholesale and retail energy markets to promote investment and operational decisions by market participants that minimise costs for customers and taxpayers.

The electricity sector has a framework to identify needs for investment in additional network capacity. The electricity market provides a framework that allows the most cost effective options for additional generation capacity and greater demand side participation to contribute to achieving the climate change mitigation objectives.

Australia faces a particularly significant challenge in responding to climate change because about 80% of its electricity generation is coal fired. This further increases the importance of considering the impact of climate change mitigation policies on energy markets, including new and existing market participants' capacity and willingness to invest.

We have identified four emerging challenges facing the energy market over the coming years, which further develop the issues discussed above:

- Forecast increases in peak demand.
- Investment requirements.
- Rising retail prices.
- Market resilience.

Forecast growth in peak demand will feed through into the need for more investment in generation and expanded network capacity – as well as to replace ageing network assets. There is emerging evidence that average energy consumption by households may be falling – at least in some states.

Forecast increases in peak demand

Macroeconomic performance drives growth in demand for energy services.

Since 2005 peak demand[1] in the NEM has grown by 3.5% a year and is forecast by the Australian Energy Market Operator (AEMO) to grow by a further 2.6% a year through to 2020.[2] This compares to growth of 1.2% a year in energy demand since 2005, and forecast energy demand growth of 2.1% a year to 2020.[3] This growth in peak demand will feed through into the need for more investment in generation and expanded network capacity, while additional investment will also be required to replace ageing network assets.[4]

Although there has been growth in energy demand since 2005, there is emerging evidence suggesting that average energy consumption by households may be falling – at least in some states. The Independent Pricing and Regulatory Tribunal (IPART) published a survey at the end of last year suggesting that average energy consumption for households in New South Wales fell by 5% over the five years to 2009-2010.[5] If this trend proved to be sustained it could have significant implications for future investment requirements – as well as for the issue of recovering costs of network investment to meet a rising peak demand.

Residential electricity customers accounted for about 28% of demand in 2008-2009 while industrial and commercial electricity customers accounted for about 72% of demand.[6] The demand from business,

1 The maximum summer demand is the peak demand period in the NEM, although some regions of the NEM have their maximum demand in the winter.

2 The forecast is based on a 10% probability of being exceeded, which is the standard to which networks are planned. The forecast for a 50% probability of being exceeded, which is the expected outcome, is also 2.6%.

3 These figures are taken from AEMO's ESOO for 2010 and relate to the medium economic growth scenario used by AEMO.

4 The AER's revenue determinations for network businesses explain these drivers in more detail for each network business.

5 "Residential energy and water use in Sydney, the Blue Mountains and Illawarra, Results from the 2010 household survey, Electricity, Gas and Water – Research Report", IPART, December 2010.

6 http://www.esaa.com.au/Library/PageContentFiles/d560ef51-89bc-477e-b3b1-8eece7427a58/Facts2010.pdf

industrial and commercial electricity customers is a derived demand as the power will be used as an input into providing services. A key factor driving economic prosperity and growth in Australia is the supply of electricity, at cost effective prices for businesses.[7]

Investment requirements

Since the start of the NEM in 1998 just over 10,000 MW of additional generation capacity has been built. Policy uncertainty, particularly about whether and when a price will be set for carbon, is currently affecting incentives to invest in generation capacity to meet the expected increase in demand. This concern is widely acknowledged by market participants and investors. It may also limit the number of market participants who are able to finance new investments, with evidence that merchant generators are struggling to access cost effective finance. Since the Global Financial Crisis (GFC) investors are pricing risk more keenly. While investment will almost certainly occur to maintain security of supply, this investment is unlikely to be the lowest cost for customers over the long term.

Given the continued reduction of state government financing of additional generation capacity – the importance of privately financed generation capacity is only likely to grow. While much of the financing may be by integrated generators and retailers (gentailers) who can finance such investments from their balance sheets, it will also be important for competition and prices that other sources of private finance are available.

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Rising prices

While the magnitude differs between states, retail energy prices have risen by up to 30% in Australia over the last three to four years.[8] Increases in network costs have been the main driver of these increases. More investment has been required to meet peak demand growth, to replace ageing assets, to meet increased state-determined reliability standards against a background of a higher cost of capital since the GFC. These investment requirements, together with a potential price for carbon and the existing measures to address climate change (such as the expanded RET), will put further upward pressure on retail prices. There are also risks that wholesale gas prices will rise in the coming years if gas on the east coast moves towards export price parity following the development of new Liquefied Natural Gas (LNG) terminals. If wholesale gas and black coal are influenced by export prices as existing contracts end, this will also affect the relative prices of these two fuels and hence electricity prices in Australia.

Competitive wholesale and retail markets provide opportunities to identify the most cost effective ways to provide services and encourage participants to seek opportunities to reduce the costs that feed through into efficient prices.

Investment in networks is also important to underpin a reliable and secure supply, but confidence that prices are efficient for this part of the industry depend on confidence in the regulatory framework and institutions.

7 Historically Australia's relatively low energy prices compared to other countries has provided an incentive for energy intensive industries such as aluminium to locate in Australia.

8 AER's State of the Energy Market report for 2010 (page 104).

Minimising policy uncertainty is an essential pre-requisite for efficient investment to meet the investment challenge in the energy sector in ways that minimise costs for consumers.

Market resilience

The expanded Renewable Energy Target (RET), and any carbon price, are expected to drive more wind generation and gas plant. They may also increase spot price volatility and therefore raise possible concerns about the resilience of the market more generally.

The high level of wind generation in South Australia (20% of capacity)[9] can lead to periods of quite volatile spot prices. For example, there were a significant number of trading intervals with negative prices on 3 and 4 October 2010. It is important to note that these types of price signals should also encourage renewable energy developers to consider carefully where to locate to maximise revenues – and may lead to more dispersion of renewable energy across the NEM. Increased intermittent wind generation may also test the security and stability of the power system, although to date AEMO has been able to manage the security and reliability of the system in South Australia even with its relatively high penetration of wind generation.

Alongside the physical resilience of the market, the expected changes in generation mix over the coming years and possible increased spot price volatility may have impacts on the resilience of the market to financial outcomes. More volatile spot prices change, and potentially increase, challenges for generators and retailers to manage and hedge their financial risks.

It will be important that there is sufficient transparency to understand the financial inter-dependencies of market participants both for exchange trading, and in Over the Counter (OTC) markets, so that risks are well understood by market participants and policy makers.

We recognise that the NEM has proven very resilient since its introduction, with strong reliability performance and relatively few participant failures. Even where participants have got into financial difficulties the mechanisms in place under the rules or state government legislation have generally worked well to minimise the impact on customers. However, the market is undergoing a fundamental period of change that is likely to test its physical and financial resilience to a greater extent than has been the case historically.

This discussion paper provides an opportunity for stakeholders to provide views on the robustness of the NEM and indicate any opportunities to improve market resilience that they believe would merit further consideration.

Strategic Priorities

We have identified three strategic priorities that will help us to address these emerging challenges:

- A predictable regulatory and market environment for rewarding economically efficient investment;
- Building the capability and capturing the value of flexible demand; and
- Ensuring the transmission framework delivers efficient and timely investment.

A predictable regulatory and market environment for rewarding economically efficient investment

Minimising policy uncertainty is an essential pre-requisite for efficient investment to meet the investment challenge in the energy sector in ways that minimise costs for consumers.

9 AER's State of the Energy Market report for 2010.

Where investors have opportunities to earn similar returns in other markets at a lower risk then they will allocate their capital to maximise their risk reward trade off. Some of the policy uncertainty can only be addressed by government decisions, such as when, in what form and at what level a carbon price is to be introduced. The AEMC can work with governments to advise on the implications for the energy markets of these policy settings to minimise market distortions and costs for customers.

The impact of policy uncertainty on investment decisions will be greater in the competitive generation and retail sectors than in the monopoly network sectors. Even when policy settings have been implemented it is also important for governments to bear in mind that uncertainty can be created (and additional costs caused), if there is an expectation or perception that the detailed implementation of policy settings will be regularly changed in the future.

The AEMC's reviews of competition in the state and territory retail energy markets consider any measures that are needed to further promote the development of retail competition, and whether price caps can be removed. They are important projects that will promote greater certainty for investors by helping to remove distortions to the development of competition. Where price caps are removed new entrants can be confident that they will be competing against rivals who set prices based on commercial factors alone, rather than price caps that can be set using objectives that change between price cap reviews.[10] The removal of retail price regulation may also allow retailers to contract for energy over longer periods, confident in the knowledge that their commercial decisions will not subsequently be undermined by changes to price regulation.

Promoting efficient investment will help to ensure security of supply, while realising cost effective demand side flexibility can reduce peaks in demand. Ensuring a robust transmission framework will help connect new generation cost effectively – minimising overall system costs.

Building the capability and capturing the value of flexible demand

Harnessing the potential of cost effective demand side response along with measures to address energy efficiency can help limit increases in prices for consumers, and will also help to address governments' environmental policy goals. The Prime Minister's Task Group on Energy Efficiency believes there is significant untapped potential for more energy efficiency in Australia. The AEMC will shortly be commencing a new review of demand side participation (DSP3) in the NEM that will look across the whole supply chain to understand the barriers to harnessing cost effective demand side flexibility.

Smart meters together with appropriate time of use pricing could be a key enabler for more demand side participation and energy efficiency. Therefore, it is crucial that the framework for smart meters and networks allows shared benefits between consumers, retailers and networks to be harnessed. However, not all customers will receive benefits or perceive that they are benefiting from the introduction of smart meters and/or time of use pricing. Time of use pricing may introduce significant differentiation between prices at different time periods, and some customers may prefer price structures with less differentiation. There are also major challenges to ensure consumers are confident that the privacy of their personal data will be respected by all those with access to it.

Market participants, particularly retailers, will have a key role in harnessing more demand side participation and helping customers realise the potential for improved energy efficiency. Customers' confidence in participating in these types of opportunities will be influenced by their

10 In most states that have retail price caps, the state government sets the overall approach that the state regulator must adopt to setting the price cap, and this approach can and often does change between reviews.

confidence in market participants. This emphasises the importance of market participants demonstrating to customers that services like transfer processes, billing accuracy and meter reading work well.

Ensuring the transmission framework delivers efficient and timely investment

Transmission networks and their future augmentation will be key to delivering the investment which is required to meet future load growth, the environmental targets of government and continued reliability and security of supply.

Substantial quantities of new wind, other renewable generation, and additional gas fired generators will need to be connected to the transmission network in order to meet the expanded RET target (45,000 GWh more of renewable generation by 2020 than was connected in 1997[11]), and to respond to any carbon price that is introduced. It is important that the commercial and regulatory framework promotes efficient overall decisions to minimise combined generation and transmission costs, as minimising total costs is the best way to ensure that customers' bills are minimised. Amongst our key projects to help deliver this strategic priority is the review of transmission frameworks, to consider whether the framework is robust to cost effectively connect new generation and associated enhancements to the transmission network. The draft rule determination recently published by the AEMC for Scale Efficient Network Extensions (SENEs) considers cost effective connection of remote generation.[12] We are also expecting to receive rule change proposals from the MCE to change the approach to planning by distribution networks. Given that providing the distribution network accounts for the majority of network costs it is particularly important that the framework delivers value for money.

The input of stakeholders, including market participants, consumer representatives and other interested parties is critical to help us make high quality decisions about rule changes and the advice we provide.

It is important to be confident that regulated allowances for network costs are the minimum necessary to deliver a reliable and secure supply. We are coming to the end of the first full cycle of revenue determinations by the Australian Energy Regulator (AER) under the current revenue determination process. The next year or so provides a good opportunity for market participants, market institutions and policy makers to reflect on the strengths and any weaknesses with the current regulatory framework.

Overall market resilience

Addressing these priorities can help to ensure the resilience of the Australian energy markets. Promoting efficient investment will help to ensure security of supply, while realising cost effective demand side flexibility can reduce peaks in demand. Ensuring a robust transmission framework will help connect new generation quickly and cost effectively – minimising overall system costs.

However, there are other elements to ensuring market resilience. The review of the prudentials framework in the NEM by the Australian Energy Market Operator (AEMO) is an important element. Another is the National Energy Customer Framework (NECF) package, which includes the development of more standardised Retailer of Last Resort (RoLR) arrangements.

It is important to remain vigilant to ensure that markets are robust to unforeseen physical and financial shocks. The GFC illustrates the potential for systemic effects in markets that are characterised by high

11 The expanded RET is targeted to deliver 20% of Australia's electricity generation compared to a 2% target for the previous scheme that ended in 2010.

12 AEMC 2011, Scale Efficient Network Extensions, Draft Rule Determination, 10 March 2011 Sydney.

value and regular trading of often complex financial products amongst a broad range of counter-parties, although the increasing use of exchanges for electricity trading helps to mitigate this risk. The physical inter-dependencies of the interconnected NEM appear to be relatively well understood by market participants. However, it is less clear that the financial and contractual inter-dependencies are as well understood. Greater transparency of information may have a role in improving this understanding; market participants continue to carry the key responsibility for managing their own risks.

While there is much the AEMC can do through the projects identified in this discussion paper to address the strategic priorities we have identified, there is a crucial role for stakeholders. The Ministerial Council on Energy (MCE) and state governments play an important role in setting the policy framework. We will need to work closely with the AER and AEMO to address many aspects of the priorities. The input of stakeholders, including market participants, consumer representatives and other interested parties is critical to help us make high quality decisions about rule changes and the advice we provide. Market participants also have a key role as the organisations and companies that meet the needs and preferences of customers on a day to day basis, and are therefore pivotal to the success of the Australian energy markets. We will continue to involve stakeholders in our work and explain our approach and decisions.

The gas market

The three strategic priorities are primarily focused on the electricity market, although addressing investment uncertainty will have benefits for the gas market as well, and removing barriers to demand side participation in electricity may have applications in the gas market. There have been a number of important developments in the gas markets in recent years, including:

- the STTM hubs in Adelaide and Sydney commenced in September 2009;
- plans for a hub to open in Brisbane in 2011 are already well advanced;
- the growth and forecast future growth of gas fired generation will increase convergence between the gas and electricity markets; and
- developments of LNG terminals on the east coast may lead to price parity with exports for domestic gas.

The AEMC has only recently been given responsibilities in relation to the gas market. Given this and the major developments with the STTM, we consider this is primarily a period for monitoring the operation of the STTM, and understanding how the market develops (including after the Brisbane hub opens), rather than undertaking substantial market development work. The National Gas Rules (NGR) also include provisions for the Australian Energy Market Operator (AEMO) to review a range of aspects of the STTM over the next few years to ensure that lessons from its actual operation are learnt.[13]

The AEMC has only recently been given responsibilities in relation to the gas market. Given this and the major developments with the STTM, we consider this is primarily a period for monitoring the operation of the STTM, and understanding how the market develops.

We are aware of some concerns that have been expressed about the initial operation of the STTM, but we understand that AEMO and market participants are considering rule changes intended to help address these concerns. We are also considering a number of other rule change proposals affecting the gas markets for which we have rule making powers. Over the coming year we intend to develop further our interaction with gas market stakeholders, which will in turn feed through into consideration of key priorities for future gas market development.

13 We have recently made a rule change determination that would alter the format and change the dates for completion of some of these reviews.

Next steps

We recognise the importance of getting stakeholder feedback on our proposed priorities. Section 6 of the discussion paper provides details on how you can provide us with your views on our proposed strategic priorities.

A public forum was held on 1 April 2011 in Melbourne to discuss the challenges currently facing energy markets.

Once we have considered the comments on this discussion paper we will publish a short paper confirming our priorities and associated work programme.

We intend to keep our priorities and associated work programme under regular review. During next year we will review and develop our approach to ensure our strategic focus remains appropriate for the challenges facing the energy markets in Australia over the coming years.

We welcome comments on this discussion paper. Please send your response to submissions@aemc.gov.au by 13 May 2011.

1. Introduction

Energy markets are constantly evolving, as demands for energy change and as the technology and costs of supply change. While change is a constant theme in energy markets, Australia (in common with many energy markets around the world) is facing a period of transformation. Creating the right regulatory and commercial environment for the development of energy markets in the future will have significant benefits for energy consumers.

We inherit a strong starting position, as a result of past energy market reforms. By engaging strategically on the key issues for future market development – with the parties who will directly affect outcomes – we are seeking to make the most of this legacy, and protect the interests of future energy consumers.

This discussion paper sets out the context, key challenges and priorities for the Australian energy sector, and in particular for the AEMC's market development role. While the paper focuses on the projects being undertaken by the AEMC, it also recognises that the delivery of effective market outcomes for energy customers depends on a range of other policy settings and market developments which the AEMC is not responsible for.

The Australian Energy Market Commission (AEMC)
The AEMC is an independent, statutory Commission with responsibility for making rules for gas and electricity markets. Our rule making powers are in Section 34 of the *National Electricity (South Australia) Act 1996* and Section 74 of the *National Gas (South Australia) Act 2008*. The AEMC cannot initiate rule changes, other than minor tidying up of the rules, but we make decisions on proposals for rule changes that are made to us. We are also responsible for reviewing and providing advice on specific energy market issues for the MCE. The MCE can direct us to undertake a review with a terms of reference under Sections 41 and 42 of the *National Electricity (South Australia) Act 1996*, and Sections 79 and 80 of the *National Gas (South Australia) Act 2008*. We also have a more general role to consider market developments and the power to undertake self initiated reviews under Section 45 of the *National Electricity (South Australia) Act 1996* and Section 83 of the *National Gas (South Australia) Act 2008*. Our remit is focused on the promotion of economic efficiency

in energy markets, which is closely associated with achieving value for money for consumers over the long term. This is the test we must apply in making rules, and the criterion we must use in providing advice.

Energy market frameworks

Rules

The rules for energy markets are a key component part of the policy framework governing behaviour in energy markets. They create a framework of obligations and commercial incentives within which market participants operate.

Given the monopoly position of the network service providers and the potential consequences of a failure to safely operate and use energy networks, a set of rules within which networks are regulated and the markets operate is required to ensure effective market outcomes for customers.

The rules also create a framework under which the Australian Energy Regulator (AER) conducts the economic regulation of networks, AEMO fulfils its system operation role, and market participants operate.

Productivity improvements are a key driver of economic growth, and the economic growth of Australia will be driven by productivity improvements in each sector of the economy, including energy.

There are well-established processes to amend the rules. Proposals are submitted and published for public consultation. Determinations are made by the AEMC based on assessments of economic efficiency consistent with the national gas and electricity objectives. The AEMC's rule-making functions have been progressively extended in scope to include distribution and aspects of gas markets, and legislation is currently being considered to include retail regulation (the National Energy Customer Framework (NECF)).

Policy settings

There are a range of policy settings outside the direct energy market rules that can substantially affect how the energy markets work. For example, policies to promote renewable generation to help address climate change have the potential to materially change the generation mix in the energy market. These policy settings can also impose significant costs on consumers. In some cases, policy will be motivated by objectives which complement and support efficiency in energy markets, e.g. removing barriers to demand side participation. In other cases, there might be a trade-off between different policy objectives, e.g. policies to address climate change may have very different effective costs of emissions abatement because they are seeking to meet other objectives as well. A clear understanding of the interactions between policy and energy market outcomes is desirable, and the AEMC's market development role can help us improve the understanding of how policy settings outside the main energy market will affect competition in the market and costs for consumers.

Achieving the market objectives

As explained above, our rule-making functions and the provision of advice to the MCE is within the context of an objective that can be broadly summarised as promoting the economic efficiency of energy markets over the long term. In order to achieve the objectives for the gas and electricity markets, it is important that we have a clear view as to the type of characteristics which would be exhibited by markets meeting this objective.

Economic efficiency can be broadly defined as promoting and making the most productive use of the available resources.

This includes allocating resources to the consumers who value them the most (allocative efficiency), looking to minimise the costs of producing outputs (productive efficiency), and promoting innovation and technological change where this allows for a more productive use of resources, including discovering new resources or different uses for existing resources (dynamic efficiency). As a consequence of these types of innovations, productivity improvements would be expected to be a feature of markets that are becoming more economically efficient.

Productivity improvements are a key driver of economic growth, and the economic growth of Australia will be driven by productivity improvements in each sector of the economy. The energy and natural resources sectors of the Australian economy accounted for about 10% of the Gross Value Added (GVA) to the Gross Domestic Product (GDP) in 2007-2008, with the electricity, gas and water sectors accounting for about 2.2% of GVA.[14]

Productivity improvements in these sectors can have a particularly big impact on economic growth in Australia because they are an input into many other industrial and commercial activities. The micro-economic and competition policy reforms of the 1990's (which led to specific energy sector reform) were driven by the need to stimulate productivity improvements and further economic growth. It is very important that the development of policies to address climate change is conducted in ways that minimise the impact on productivity improvements and economic growth in the energy sector.

A lot has been achieved in promoting more economically efficient energy markets in Australia. There are only a small number of countries elsewhere in the world that have similarly competitive energy markets.

In the context of energy markets, economic efficiency will be achieved by removing barriers to competition in those parts of the market where competition can develop, including retail, production and generation activities, as well as some interconnection and major pipeline developments.

Competitive retail, gas production and generation markets will be characterised by a range of market players, entry and exit to the market that reflects low barriers, and customers exercising choice and searching for value for money. Competitive markets should also provide strong incentives for producers and generators to invest in a timely manner in the capacity needed to meet expected demand and to promote innovation and technology changes.

A key part of competitive production, generation and wholesale activities is the presence of liquid spot and contract markets to allow market participants to access energy and facilitate risk management. Access to a range of sources of capital is also important to facilitate investment in new capacity at competitive prices.

The effectiveness of competition can be impacted by policy settings and policy uncertainty. For example, retailers may be cautious about entering into long term contracts with generators for wholesale electricity if retail price regulation remains in place, because they may perceive a risk that changes to the approach to setting price caps will undermine the value of their contracting decisions.[15]

14 See page 471 of the Australian Yearbook 2009-2010 published by the Australian Bureau of Statistics. GVA is the measure of the specific value added to GDP of each sector.

15 There will be other factors that also affect the willingness of retailers and generators to enter into long term contracts.

The energy sector is responsible for a range of negative environmental impacts, including carbon emissions, which are known as externalities.[16] As illustrated by the current discussion in Australia on whether and how to price carbon emissions, these externalities can often be priced, such that incentives to minimise the level of emissions can be factored into the decisions of market participants. Although it is not the AEMC's role to determine which externalities should be priced or at what level, we recognise that an economically efficient energy market will be characterised by the facilitation of good decision-making by participants who face the costs of the externalities they produce. One of the benefits of a liberalised energy market is that it allows market processes to be used to identify the most efficient ways to reduce externalities such as carbon emissions if measures to achieve this are appropriately designed, and their interactions with energy markets considered.

Regulation will be needed to ensure that network service providers with monopoly power do not pass on excessive costs to customers and provide access to their networks on non-discriminatory terms so that effective competition amongst retailers and generators can develop. Regulation is intended to mimic outcomes in a competitive market, so good regulation will reward those networks that deliver value for money and good quality service, while those that provide poor value for money and poor service quality will receive lower returns.

Regulation is needed to ensure that network service providers with monopoly power do not pass on excessive costs to customers and provide access to their networks on non-discriminatory terms. Good regulation rewards those networks that deliver value for money and good quality service, while those that provide poor value for money and poor service quality will receive lower returns.

We discuss the current market situation in Australia in more detail in the next section of this paper, but there is no doubt that over the last decade substantial progress has been made towards achieving energy markets that meet the economic efficiency objective.[17] This includes the introduction of retail competition and the development of the NEM and the STTM. This is not to suggest that more work is not required or that significant challenges do not lie ahead, but a lot has been achieved in promoting more economically efficient energy markets in Australia. There are only a small number of countries elsewhere in the world that have similarly competitive energy markets.

Structure of this discussion paper

Section 2 of this discussion paper provides the context for the rest of the paper by summarising the current situation in Australian energy markets and identifying some of the key challenges facing the market.

Sections 3 to 5 discuss in turn the three key strategic priorities that the AEMC has identified, why they are key priorities and the work we are doing to address the priorities.

Section 6 summarises the other key strands of work that the AEMC is undertaking and explains how this strategic priorities discussion paper will be taken forward through stakeholder consultation.

16 An externality is a consequence of an activity that has negative impacts on other people or businesses. So if a coal fired generator emits carbon dioxide that leads to negative climate change impacts for people, this can be said to be an externality of coal fired generation.

17 We discuss some of the evidence to support this view in the subsequent sections of the discussion paper, but amongst other evidence is the IEA's assessment of Australia's energy sector from 2005.

2. Market overview and the key challenges

A discussion of strategic priorities must be grounded in an understanding of the energy sector. From this understanding we can identify the key challenges facing the sector and those which may increase in importance in the coming years.

Development of the National Electricity Market (NEM)

When the wholesale market part of the NEM started in December 1998 there was general confidence that it would "work" from an operational viewpoint. The years of experimental, controlled trials and staged development and expansion, had given confidence that the generation dispatch, spot market price determination, settlement systems, transmission system operation and the rules (known then as the code) that supported them, would work as intended.

System security and reliability could be maintained while devolving many (but not all) of the decisions formally made by the state and territory based central/integrated monopolies to multiple independent market participants. The coordination of production from different power stations – necessary in any interconnected power system – was achieved through centralised dispatch reflecting price offers established in accordance with the rules. The combination of a reallocation of risks from customers to market participants that flowed from establishing a competitive market structure and the commercial incentives operating on participants drove productivity improvements from the existing capital stock.

The big questions that could not be trialled other than in real life were how the contract market would develop once the initial or vesting contracts expired, or as a consequence, what industry structure would emerge in response to capital market imperatives and whether investment in additional generation capacity would be of generally the right type, in the right place and at the right time.

In this section we review how the NEM and the wider Australian energy market has developed.

All major electricity transmission investments by Transmission Network Service Providers have to be assessed for their net market benefits through the Regulatory Investment Test for Transmission (RIT-T). Providers must identify credible options to achieve the outcomes they are seeking, including non-network alternatives such as demand side participation, and assess whether any options have positive cost benefit outcomes. The transmission business must then select the option expected to have the highest net market benefits.

Market overview

Resources

Australia has abundant high quality reserves of fossil fuels which can be accessed at relatively low cost and is the world's ninth largest energy producer. Two thirds of this energy is exported, mainly to the emerging economic powers in the Asia-Pacific region.

Australia continues to have access to substantial reserves of black and brown coal. The identified conventional gas resources have increased significantly in recent years. Australia's economic demonstrated and sub-economic demonstrated reserves of conventional gas in 2008 were 180,400 petajoules.[18] To put the scale of these reserves in context this is equivalent to 63 years of production at current rates. A large part of the recoverable gas reserves are located off the North West shelf. There is also increased use of coal seam gas, mainly located in Queensland and New South Wales. Increased use is being made of renewable energy sources, in particular wind and solar. With 20% of electricity generation capacity from wind, South Australia has the second highest penetration of wind generation of any jurisdiction in the world.[19]

Networks

The NEM has about 42,000 km of electricity transmission lines and 750,000 km of electricity distribution lines. The NEM is an interconnected transmission network, with regulated interconnectors between most regions. Only Basslink between Tasmania and Victoria operates as a market link and is unregulated for pricing purposes. Electricity transmission, some gas transmission pipelines and all energy distribution networks are regulated.[20]

A regulatory cap on revenues is established by the AER. These regulatory caps are reset at five year intervals. About $39 billion is expected to be spent on electricity network investment in the current five year regulatory periods.

All major electricity transmission investments by Transmission Network Service Providers (TNSPs) have to be assessed for their net market benefits through the Regulatory Investment Test for Transmission (RIT-T). This process requires the TNSPs to identify a range of credible options to achieve the outcomes they are seeking, including non-network alternatives such as demand side participation, and assess whether any options have a positive cost benefit outcome. The TNSP must then select from those options the one expected to have the highest net market benefits. TNSPs are required to consult with interested stakeholders during the RIT-T process. The RIT-T process allows consideration of new investments to address the full range of possible needs for additional investment, including improved reliability, removing network constraints to allow greater access for generation, and additional interconnection between regions. Although it will be primarily TNSPs who initiate RIT-Ts, any stakeholder can ask for a RIT-T to be undertaken if they fund it.

18 https://www.ga.gov.au/image_cache/GA17052.pdf

19 Denmark has the highest penetration.

20 With the exception of Basslink, an unregulated transmission line.

The RIT-T has only been in place since 2010, although a number of features of it were in the previous Regulatory Test. Nevertheless, we would be interested to receive initial feedback on whether the RIT-T appears to be achieving its aims, and in particular, whether it is proving effective in considering a broader range of options beyond just network investment solutions, and whether it is being used to consider the full range of possible market benefits.

There is currently a Regulatory Test in place for major investments by Distribution Network Service Providers (DNSPs), but this does not include the same consultation requirements as the RIT-T. The AEMC submitted a report on the Distribution Planning Framework to the MCE last year, which recommended the introduction of a Regulatory Investment Test for Distribution (RIT-D), and the MCE has stated that it will submit rule change proposals to implement this recommendation to the AEMC in due course.

As would be expected in an interconnected market such as the NEM there is significant inter-regional trade and inter-dependence.

Australia has two wholesale markets for electricity, the NEM in the eastern seaboard and the Wholesale Electricity Market (WEM) in Western Australia. The AEMC has rule making powers for the NEM.

Table 2.1 below shows the net and total exports and imports of electricity across each of the interconnectors in the NEM in 2008-2009. There were significant imports to New South Wales from Queensland and to Tasmania from Victoria.

Table 2.1: Imports and exports over the interconnectors in the NEM in 2008-2009[21]

2008-2009	NET IMPORTS (GWH)	TOTAL IMPORTS (GWH)	TOTAL EXPORTS (GWH)
Heywood – Victoria to South Australia	393	829	436
Murraylink – Victoria to South Australia	-166	52	218
Terranora – New South Wales to Queensland	-712	6	718
QNI – New South Wales to Queensland	-4199	124	4323
Basslink – Tasmania to Victoria	-2570	74	2644
Victoria to New South Wales	941	2099	1158

Table 2.2 below shows the total demand and generation in each NEM region in 2008-2009. This table reinforces the trends that can be observed in the previous table with Queensland and Victoria generating substantially more electricity than they consume, while the other three states all consume more electricity than they generate. There will be some year to year variations in the absolute magnitude of these trends, but broadly they reflect the differences in resource costs for generation across the NEM, with those states that are relatively lower cost for generation tending to generate more than they consume and vice versa.

21 AEMO's 2010 Electricity Statement of Opportunities.

Table 2.2: Total demand and generation in each NEM region in 2008-2009[22]

STATE	TOTAL DEMAND	TOTAL GENERATION
Queensland	52.3 TWh	59.7 TWh
New South Wales	78.2 TWh	72.7 TWh
South Australia	13.4 TWh	12.2 TWh
Victoria	51.7 TWh	54.3 TWh
Tasmania	10.1 TWh	7.5 TWh

The size of the gas transmission pipeline network has trebled since 1991 to approximately 20,000 km, with approximately $4 billion invested or committed to transmission pipeline development since 2000. The eastern seaboard now has a largely interconnected gas network. There are also major gas networks in Western Australia and the Northern Territory. In addition there is over 80,000 km of gas distribution pipelines.

The size of the gas transmission pipeline network has trebled since 1991 to approximately 20,000 km, with approximately $4 billion invested or committed to transmission pipeline development since 2000. The eastern seaboard now has a largely interconnected gas network. There are also major gas networks in Western Australia and the Northern Territory.

Most new gas transmission investment in Australia in recent years has been commercially driven and outside of price cap regulation by the AER. However, there are mechanisms under the law whereby parties can ask for consideration of whether a new gas transmission pipeline should be subject to price cap regulation. Most new investment in gas distribution networks occurs within a regulatory regime overseen by the AER.

Wholesale markets

Australia has two wholesale markets for electricity, the NEM in the eastern seaboard and the Wholesale Electricity Market (WEM) in Western Australia. The AEMC only has rule making powers for the NEM. The WEM is separately regulated by the authorities in Western Australia. The other electricity systems in Western Australia and the Northern Territory are also outside the AEMC's responsibilities.

In the NEM, spot prices are set every half-hour on the basis of bids and offers to consume and produce electricity. Generators receive payments for the energy supplied when they are dispatched. Spot prices averaged $40/MWh in financial year 2009-2010. This compares with an estimate of $68/MWh for the levelised cost of Combined Cycle Gas Turbine (CCGT) plant under a low fuel cost scenario in Australia.[23] Spot prices are volatile, dropping to negative levels when demand is low and there is excess capacity and rising as high as $12,500/MWh (the market price cap) when capacity is tight. Using volume weighted average spot prices by region in the NEM[24], we can see different price trends between the regions. Since 2005 New South Wales'[25] spot prices have been relatively stable[26], and those in Tasmania have also been relatively stable until they fell quite significantly last year.[27] Spot prices in Queensland and Victoria increased significantly from 2005, but have subsequently fallen back[28], while spot prices in South Australia[29] have increased and been relatively volatile.

22 http://www.ret.gov.au/energy/Documents/facts%20statistics%20publications/Energy%20in%20Aust%202010_FINAL-01.pdf

23 http://www.ret.gov.au/energy/Documents/facts-stats-pubs/Fossil%20Plant%20Performance%20and%20Cost%20Summary%202010.pdf

24 All figures are taken from the AER's State of the Energy Market report for 2010.

25 With the exception of 2006-2007.

26 New South Wales' prices were between $43 and $52 per MWh, except for 2006-2007 when they were $67 per MWh.

27 Between $51 and $62 per MWh until last year when they fell to $30 per MWh.

28 Between $31 and $58 per MWh for Queensland and between $36 and $61 per MWh for Victoria.

29 Between $44 and $101 per MWh.

Although the relationship will vary between states and at different times of year, Figures 2.1 and 2.2 below illustrate the relationship between monthly demand and monthly time weighted average spot prices in the New South Wales and Victorian regions of the NEM during 2010. Neither of the figures shows a strong relationship between monthly demand levels and monthly average time weighted spot prices. There is evidence of a relationship for New South Wales with the months that had the lowest average spot prices also tending to have the lowest demand levels, but the highest average spot prices did not occur in the months with the highest demand levels. The relationship is even weaker for Victoria with the highest average spot prices occurring in the month with the lowest demand. However, the relatively weak relationship for New South Wales and Victoria last year suggests that other factors such as availability of supply to meet expected demand and transmission constraints may be important determinants of price trends.

Although the NEM is an interconnected electricity market that allows price arbitrage to reduce spot price differences between regions, it is likely that even over the long term some price differences will remain because the costs of building additional interconnection capacity would outweigh the benefits of more price arbitrage.

Figure 2.1: Monthly demand and monthly weighted average spot prices during 2010 in New South Wales[30]

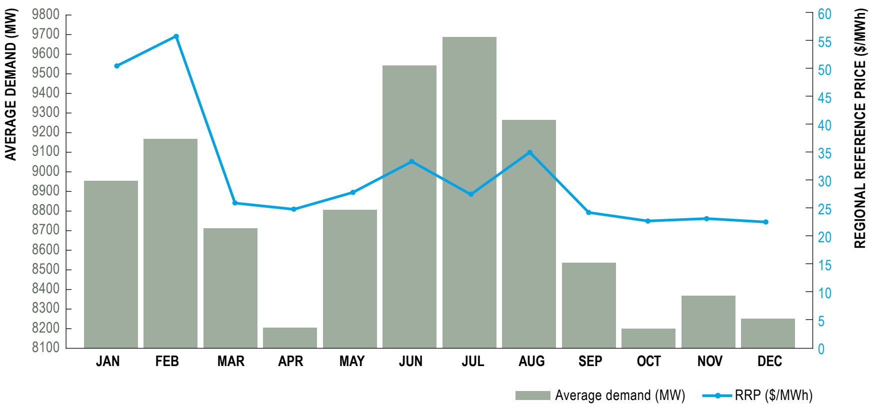
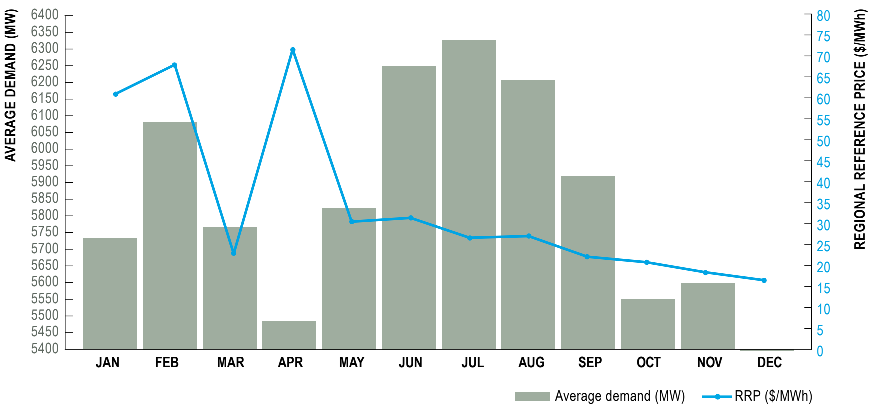


Figure 2.2: Monthly demand and monthly weighted average spot prices during 2010 in Victoria[31]



30 This figure and the figure for Victoria are created from information published by AEMO.

31 This figure and the figure for New South Wales are created from information published by AEMO.

An international study recently ranked Victoria as the most competitive retail electricity market in the world, with Queensland, New South Wales and South Australia also ranked in the top ten most competitive retail electricity markets.

Generators and retailers are directly exposed to these volatile spot prices. They may face inverse risks from spot price movements. The market has developed tools that allow generators and retailers to manage these risks. A range of contracts are traded between retailers and generators, and some pure traders, which manage spot price and volume risk. In 2008-2009 the Sydney Futures Exchange reported that more than 300 TWhs of electricity had been traded on its exchange. This is approximately 150% of the electricity generated in the NEM that year. This exchange and Over-the-Counter (OTC) contract markets are important to the effective operation of the wholesale electricity market. Retailers can also use their own generation portfolio as a natural hedge against price risk, and this is an increasing feature of the Australian energy market. Retailers also face the risk associated with forecasting their customers' demand and generators face the risk of not being able to generate to meet their contract commitments.

While there is a significant volume of trade through the Sydney Futures Exchange, some contract market activity will be Over-the-Counter (OTC) trading, which means that it is bilateral between two parties, or with a broker acting as an intermediary. There is inevitably less external transparency about OTC trading compared to exchange based trading. However, the Australian Financial Markets Association (AFMA) publishes information that collates voluntary reporting by brokers of trading activity, and we understand that some brokers provide reporting services on their aggregated trading activities.

The NEM price regions coincide with the state boundaries[32], reflecting the historical basis for power sector development. Prices have the potential to separate between regions when transmission lines connecting the two regions are congested. This creates a risk for inter-regional trade. The risk can be hedged to some extent by forward purchasing the settlement residue cash flows which arise when power flows between regions, or through OTC trading.

The AER and AEMO have identified a range of relatively high spot price events that have been significantly impacted by reduced interconnector availability in the NEM. It will often be difficult to distinguish all of the potential causes of higher spot prices. There is no consistently reported measure of transmission or interconnector constraints which can be compared to spot prices. Although the NEM is an interconnected electricity market that allows price arbitrage to reduce spot price differences between regions, it is likely that even over the long term some price differences will remain because the costs of building additional interconnection capacity would outweigh the benefits of more price arbitrage. Regional price differences are a common feature of interconnected electricity markets in other parts of the world, such as Nordpool, where the costs of investment to reduce price differences further are considered to outweigh the potential benefits.

32 The Australian Capital Territory is within the New South Wales region.

Gas is principally traded through long term contracts between gas producers, gas retailers and other major consumers. However a wholesale gas market was established in Victoria in 1999, based on injections into and withdrawals from the transmission system that links multiple producers, major users and retailers. A Short Term Trading Market (STTM) for gas was introduced in September 2010 initially operating at hubs in Sydney and Adelaide. Work is already well advanced to develop an STTM hub in Brisbane. The STTM is a market based on wholesale gas balancing. The market will set daily market prices and settle each hub based on the schedules and deviations from schedules. So far a liquid contract market outside the STTM has not emerged for the trading of gas, which may have implications for future market entry and risk management by market participants.

Retailers

Residential and small business consumers are generally protected from price volatility through prices that are fixed for a period of time into the future. Retail price structures vary across the states and territories, but generally prices are per unit of energy linked to the level of consumption of a customer. There may also be different prices for units of energy used at different times of the day or depending on the total volume of energy used by customers. Larger industrial and commercial customers may choose or be offered contracts that link the wholesale element of their price to movements in the spot price for electricity in their region, so they would be exposed to the volatility of spot market prices.

The National Energy Customer Framework (NECF) consists of a legislative package that will establish a national regulatory regime for retailers and distributors selling and supplying energy to consumers. The package also creates a national energy consumer protection framework.

Prices are principally set through competition, with high levels of churn (consumer movement from one retailer to a competitor).[33]

An international study recently ranked Victoria as the most competitive retail electricity market in the world, with Queensland, New South Wales and South Australia also ranked in the top ten most competitive retail electricity markets.[34] This study estimated that Victoria had seen customer churn of over 25% in each of the last three years. Victoria also had customer churn of over 25% for gas in 2009. In 2009, Queensland, New South Wales and South Australia all had churn rates of more than 10% for retail electricity customers. Churn rates in the gas retail markets were lower in these states, but South Australia still had a churn rate of more than 10%. Retail electricity tariffs are regulated in all states and territories other than Victoria.[35] The AEMC has previously recommended the removal of retail price regulation in South Australia, but the South Australian Government decided to retain retail price regulation.

Many electricity and gas customers have entered into market or negotiated contracts under which they are provided retail energy services. For small electricity and gas customers these contracts generally adopt a standard form as they are subject to consumer protection regulation regarding various terms and conditions. Typically these contracts' terms are three years or shorter and, depending on the state or territory, customers may be required to pay termination fees if they choose to terminate those contracts prior to the expiry of their terms.

33 Tasmania is the only region in the NEM without full retail competition. Parts of Queensland also do not have full retail competition.

34 A survey by VassaETT rated three of Australia's state retail energy markets as amongst the ten most competitive in the world. 'World Energy Retail Market Rankings 5th Edition', Utility Customer Switching Research Project, Published by VaasaETT, September 2010.

35 Retail price regulation was removed by the Victorian Government following a recommendation by the AEMC. The Victorian Government put in place a monitoring regime for retail prices.

Large electricity and gas customer contracts are not subject to consumer protection laws to the same extent and their terms and conditions are likely to vary to reflect the outcome of negotiations with retailers.

The National Energy Customer Framework (NECF) consists of a legislative package that will establish a national regulatory regime for retailers and distributors selling and supplying energy to consumers. The package also creates a national energy consumer protection framework. Energy consumers living in different parts of Australia will benefit from consistent consumer protection levels, irrespective of the jurisdiction in which they reside. An example is the proposed national hardship requirements for vulnerable customers. The way retailers meet their obligations under the NECF will be very important to maintaining the confidence of customers in the competitive retail markets.

The metering for the majority of households and smaller business consumers does not provide information on half-hourly consumption. The wholesale electricity market is settled using half hourly meters and a net system load profile for consumers in a distribution region who do not have half-hourly meters.

Energy consumers living in different parts of Australia will benefit from consistent consumer protection levels, irrespective of the jurisdiction in which they reside. An example is the proposed national hardship requirements for vulnerable customers. The way retailers meet their obligations under the NECF will be very important to maintaining the confidence of customers in the competitive retail markets.

Greater information on consumption for these consumers will be provided in some states, and particularly Victoria, following the roll-out of smart meters, which record half-hourly consumption.

Government policy framework

The most significant government policy settings which affect the energy market are those related to abatement of greenhouse gases, although these policies often have other policy objectives as well. These policies are designed to reduce the carbon intensity of electricity generation, to promote renewable generation and increase diversity of energy supply, enhance energy security and to increase energy efficiency and reduce demand.

Two main supply-side instruments are in use at Commonwealth level – a mandatory renewable energy target, including a fixed price scheme for small scale renewable energy (SRES), and capital contributions for small scale systems. The measures forming the expanded RET came into effect in January 2011. In addition, there are demand side measures, including an obligation on large energy users to improve their energy efficiency.

The expanded RET replaces the Mandatory Renewable Energy Target (MRET). The MRET was originally designed to ensure an additional 9,500 GWh (about 2%) of generation from renewable sources compared to 1997 levels by 2010. The expanded RET established under legislation passed in August 2009 commits the Federal Government to ensuring that 20% of electricity comes from renewable sources by 2020. This requires an additional 45,000 GWh by 2020 against the level of renewable energy output in 1997. The expanded RET target is divided between large and small scale generation, with 41,000 GWh of the target expected to be met by the Large-Scale Renewable Energy Target (LRET).

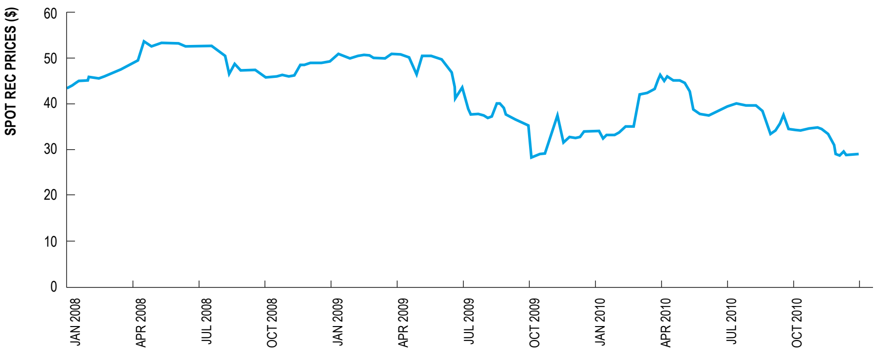
The mechanism for achieving these targets is an obligation placed on retailers to source a defined percentage of their energy from both small and large scale renewable sources. The obligation is discharged through surrender of small and large scale Renewable Energy Certificates (RECs). The amount of certificates to be surrendered by retailers to meet the LRET grows steadily up to 2020 to meet the final target. Certificates can be banked from one year to the next, so the increasing target may not necessarily be met precisely in each year. The amount of certificates to be surrendered for the SRES is set each year by the Minister for Climate Change and Energy Efficiency following advice from the Office of the Renewable Energy Regulator (ORER), and has been set at 28 million for 2011.

Trade in RECs should reveal the efficient price of meeting the obligation. The RECs provide an additional source of revenue for eligible generators, over and above revenues from the wholesale electricity market. Concern has been expressed recently by a number of retailers that the relatively low level of the REC price due to the large number of RECs created under the MRET, is acting as a disincentive to investment to meet the target, although lower REC prices would feed through into lower prices for consumers. Retailers can choose to pay a penalty price of $55 instead of surrendering a REC.[36]

Australia is one of the few liberalised and competitive energy markets that is also implementing a range of measures to address climate change. This increases the importance of ensuring that measures to tackle climate change are introduced in a way that minimises distortions to the achievement of economic efficiency.

Figure 2.3 shows the trend in REC prices over recent years. This shows that there has been a recent fall in REC prices, which appears to be primarily due to the large number of RECs created under the small scale element of the MRET, which included a solar multiplier so that households received five RECs for each eligible unit of electricity.

Figure 2.3: Trend in Australian Renewable Energy Certificate (REC) prices in recent years



Data source: AFMA Environmental Products Curve

There is some debate amongst renewable energy developers about the REC price required for renewable energy projects to be profitable given expectations about future wholesale prices. However, there is significant concern amongst renewable energy developers that the recent levels of REC prices would not be sufficient if they were expected to be sustained.

36 The effective penalty price for a company will take account of the tax treatment of RECs.

Several states have additionally introduced feed-in tariffs. Feed-in tariffs provide a guaranteed payment of a defined level and term for energy produced or supplied to the grid from small scale distributed generation such as solar photovoltaics. Table 2.3 below shows the current value of the feed-in tariff for each state and territory within the NEM compared to the retail price of electricity in that state. The table shows which states have gross feed-in tariffs where the customer receives the tariff for all electricity generated and those that have net feed-in tariffs where the customer receives the tariff only for electricity that is greater than their consumption, and which is therefore put into the distribution network. As the table shows there is a significant variation between feed-in tariff rates although three states have broadly similar rates.

Table 2.3: A comparison of states and territories feed-in tariff rates[37] compared to their standing offer retail electricity prices[38] for residential customers

All figures are c/kWh	NSW	QLD	VIC	SA	ACT	TAS
Type of feed-in tariff	Gross	Net	Net	Net	Gross	Net
Current feed-in tariff rate	20	44	60	44	45.7	Retail price*
Standing offer retail electricity price	21.22	20.69	22.45	24.58	15.9	20.43

* This is offered by Aurora Energy rather than directly by the Tasmanian Government

A rapid increase in gas consumption is forecast, leading to a trebling of consumption in Queensland by 2029, and a doubling in Victoria by 2024. A major contributing factor is a forecast increase in the share of gas-fired generation in electricity production.

It is difficult to get a consistent comparison of the costs per unit of electricity generated through installations benefiting from the feed-in tariffs. Analysis for the Commonwealth Department of Resources, Energy and Tourism[39] suggests that the levelised cost of Solar Photovoltaic (PV) – which is the most common technology being installed under state feed-in tariffs – was about 30 cents/kWh in 2009 prices for 5MW installations using fixed plate PV technology, but most residential scale installations will be for smaller capacities generally starting at around 1.5kW.

The Prime Minister's Task Group on Energy Efficiency has recently issued its report with a range of recommendations for improving Australia's energy efficiency. The report identified Australia's much higher per capita carbon emissions from energy use than the OECD average (about 18 tonnes of carbon per person compared to the OECD average of about 11) as a sign of this untapped potential. Amongst the recommendations is bringing together the current state based schemes to develop a national scheme to promote energy efficiency through retailers, and expanding the existing energy efficiency scheme for large energy users to cover transmission, distribution and generation activities.

37 Feed in tariffs included are NSW – Solar Bonus Scheme; Queensland – Solar Bonus Scheme; Victoria – Premium Feed-In Tariff Scheme; South Australia – South Australia Solar Feed-In Scheme. (The South Australian Government has announced that it intends to increase the tariff rate to 54 c/kWh. However, these changes have not yet passed the South Australian Parliament); ACT – ACT Feed-In Tariff Scheme; and Tasmania – No current jurisdictional scheme.

38 Standing offer retail electricity prices relate to prices for 2010-2011 and are based on jurisdictional retail price determinations for New South Wales, South Australia, Tasmania, ACT and Queensland, and published standing offer tariffs for Victoria.

39 http://www.ret.gov.au/energy/Documents/facts-stats-pubs/EPRI%20Fact%20Sheet.pdf

In the electricity sector, estimates of the required generation investment over the next five years are up to $1.5 billion per year. The nature of this investment will be significantly impacted by uncertainty about when and how a price will be placed on carbon emissions. The uncertainty makes financing baseload, and possibly mid-merit power generation, very difficult and appears likely to drive investment in peaking gas fired generation alongside the wind generation that is being encouraged by the RET.

Challenges

We have identified four main challenges for the development of the energy markets in Australia in the next few years, and these challenges provide the context for our strategic priorities. These challenges are:

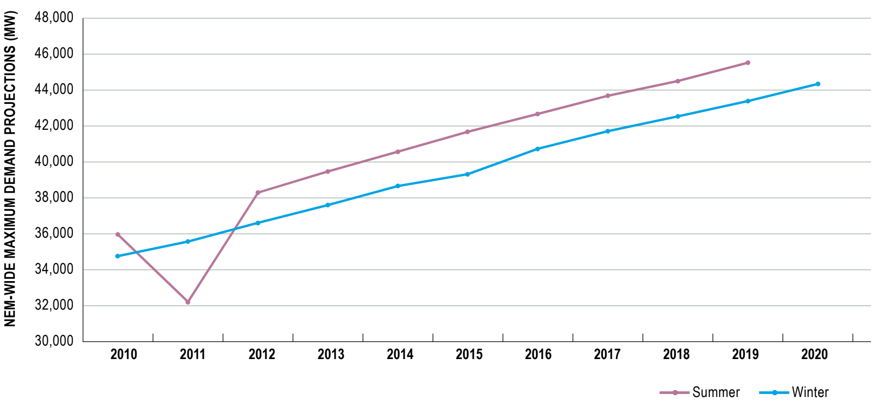
- Forecast increases in peak demand.
- Investment requirements.
- Rising prices.
- Market resilience.

Australia is one of the few liberalised and competitive energy markets that is also implementing a range of measures to address climate change. This increases the importance of ensuring that measures to tackle climate change are introduced in a way that minimises distortions to the achievement of economic efficiency.

Forecast increases in peak demand

AEMO's latest projections forecast 2.1% annual growth in electricity consumption across the NEM up to 2020. AEMO is forecasting an annual 2.5% increase in the winter maximum demand and 2.7% in the summer maximum demand over the period to 2020 using the same forecasts of economic growth. These forecasts are underpinned by assumptions of continued economic growth in Australia.

Figure 2.4: Summer and winter peak demand forecasts for the NEM[40]



Peak demand forecasts have an important influence on the infrastructure development, and particularly planning for network development. It is important that the forecasts are as accurate as possible because over forecasting of peak demand could lead to over building of capacity, while under forecasting of peak demand could lead to insufficient capacity being developed. It will be important to continue to monitor the ex post accuracy of the peak demand forecasts and look to continually improve the forecasting methods that are used.

A rapid increase in gas consumption is forecast, leading to a trebling of consumption in Queensland by 2029, and a doubling in Victoria by 2024. A major contributing factor is a forecast increase in the share of gas-fired generation in electricity production. Again, the market framework and policy settings need to be conducive to investment to meet this increased demand. The increasing importance of gas fired generation will also drive greater convergence between the electricity and gas markets.

40 AEMO's Electricity Statement of Opportunities 2010.

It is important that the energy markets provide opportunities for a range of business models to have a chance to succeed, and those models which best meet the needs of customers and shareholders will be the ones that survive in the longer term.

Investment requirements

Since the introduction of the NEM, Australia has seen substantial investment in generation capacity (about 10,300 MW[41] compared to installed capacity of about 45,000 MW), which has allowed strong demand growth over that period to be met. AEMO's latest projections suggest that based on committed generation projects the minimum reserve level may be breached in Queensland in 2013-2014 and South Australia in 2015-2016 given AEMO's medium economic growth scenario.[42] Table 2.4 compares AEMO's assessment of when the minimum reserve levels in each state would be breached between the 2010 and 2009 Electricity Statement of Opportunities.[43] It also shows the change in the year when the minimum reserve level is forecast to be breached. The accuracy of the demand forecasts and the expectations of plant retirements and new developments will affect the accuracy of these forecasts.

Table 2.4: AEMO's forecasts of when the minimum reserve level would be breached based on an assessment of future generation projects

	2009 ESOO		2010 ESOO		
REGION	LRC POINT	RESERVE DEFICIT (MW)	LRC POINT	RESERVE DEFICIT (MW)	CHANGE IN LRC POINT
Queensland	2014 | 15	34	2013 | 14	726	1 year earlier
New South Wales	2015 | 16	182	2016 | 17	27	1 year later
Victoria	2013 | 14	17	2015 | 16	249	2 years later
South Australia	2012 | 13	68	2015 | 16	50	3 years later
Tasmania – summer	>2019 | 20	N/A	>2019 | 20	N/A	Same
Tasmania – winter	–	–	>2020	N/A	N/A

The publication by AEMO of this information is intended to help inform market participants, investors and policy-makers about the potential need to invest in additional generation capacity to meet demand requirements.

However, it is important to recognise that investors seek to build new power stations at the point when it is most profitable to do so, which means they will aim to build neither too early nor too late from their perspective. Therefore, forecasts of gaps between supply and demand a number of years into the future need to be considered in the context of the time it takes to build a new power station. This time period will vary depending on the type of power station, specific location, and a range of other factors.

Another factor that will affect the decision about which types of capacity to invest in is, for example, future movements in gas prices.

41 AER's State of the Energy Market report for 2009.

42 When making these projections AEMO seeks to optimise the use of the interconnectors to push out as far into the future as possible the date when the minimum reserve level is forecast not to be met for a region.

43 This is for AEMO's medium growth economic growth demand scenario.

The expected high levels of investment in renewable energy to meet the expanded RET, load growth, and over the longer term in response to any pricing of carbon emissions, will test the ability of networks to connect large amounts of new generation, at times remote from the existing networks.

By way of example, a typical CCGT plant will take between two and three years to build from the time at which a company makes a decision to proceed with the investment, although it will take much longer from the initial consideration of suitable sites for a power station and given the need for various environmental permits. Nevertheless, the potential for additional investment in generation to be required to meet demand projections in the medium term increases the importance of ensuring that the NEM and the wider policy environment do not create barriers to investment. Investors will make commercial decisions about the desirability of investing in new generation capacity in the NEM.

Given the strength of forecast demand growth and the need to meet a range of environmental obligations, the electricity and gas sectors are entering a period when a higher level of investment will be required.

In the electricity sector, estimates of the required generation investment over the next five years are up to $1.5 billion per year. The nature of this investment will be significantly impacted by uncertainty about when and how a price will be placed on carbon emissions. The uncertainty makes financing baseload, and possibly mid-merit power generation, very difficult and appears likely to drive investment in peaking gas fired generation alongside the wind generation that is being encouraged by the RET. This seems unlikely to be the long term least cost combination to meet future demand requirements, but is a reflection of which technologies investors are willing to fund given the policy uncertainty.

In recent years investment in new generation capacity has been concentrated amongst a smaller number of larger generator retailers, with relatively few projects undertaken by independent or merchant generators. There are a number of factors driving this trend including difficulties for merchant generators in accessing cost effective finance since the GFC, uncertainty about carbon pricing and the desire of retailers to have a natural rather than contractual hedge. If this trend continues it could have implications for the degree of competition in the market and the liquidity of the contract markets.

About 50% of generating capacity in the NEM is owned by state governments. State governments have generally indicated that they will not finance new generating capacity. Therefore, most recent new generating capacity in the NEM has been financed by the private sector. We have seen an increased trend for vertically integrated gentailers to finance new investment.

Table 2.5 shows the committed and advanced generation projects in recent years. The gentailers account for a significant proportion of these investments. Very few of the projects are project financed merchant generation plants.

Table 2.5: Completed, committed and advanced proposal (scheduled) since 2009

		2009	2010	2011	2012-13	TBA	OWNER – OFFTAKER
QLD	Mount Stuart		123 MW			1000 MW	Origin
	Darling Downs		644 MW				Origin
	Braemar 2		519 MW				Origin/ERM
	Condamine		144 MW				AGL/QGC
	Blackwater		30 MW				Bow Energy
	Spring Gully						Origin
NSW	Tallawarra	435 MW					TRU
	Uranquinty	644 MW					Origin
	Colongra		724 MW				Delta
	Gunning WF			47 MW			Acconia
	Woodlawn WF			42 MW		360 MW	Infigen
	Leaf's Gully						AGL
VIC	Bogong		140 MW				AGL
	Macarther WF						AGL
	Oaklands			67 MW			AGL
	Mortlake			567 MW			Origin
SA	Hallett 4-5		185 MW				AGL
	Hallett stage 2		71 MW				AGL
	Waterloo		111 MW				Roaring 40s
	Clements Gap		57 MW				Pac Hydro
	Snowtown			206 MW			Trustpower

Source: AEMO Electricity Statement of Opportunities 2010
Note: excludes expansion of existing capacity

While the financing challenge for competitive generation activities is very different from that for networks, the scale of expected future investment in networks will contribute to greater demand for finance.

It is important that the energy markets provide opportunities for a range of business models to have a chance to succeed. Those models which best meet the needs of customers and shareholders will be the ones that survive in the longer term. Business models will differ in terms of company structure, such as the degree of vertical integration, ownership structure, and capital structure, including the role of debt and equity in financing.

Investment in electricity networks over the next decade is also set to increase significantly.

In 2009 the AER approved a capital expenditure program for the New South Wales network businesses of $14.4 billion over the period 2009-2014. The AER final determination for Victoria for the period 2011-2015 is $7 billion or a 45% increase over the current approved capital expenditure levels. The funding of capital expenditure through a depreciation allowance and a return on the capital investment are a key component of the prices that network businesses are allowed to charge. As network businesses are capital intensive over half of their revenues will relate to the funding of capital expenditure.

There are a range of major investments being undertaken in gas infrastructure, including LNG terminals and pipelines. There is also the potential for the development of coal seam gas, particularly in Queensland. BG Group and Santos have each recently committed to major gas investment projects in Queensland.

While the financing challenge for competitive generation activities is very different from that for networks, the scale of expected future investment in networks will contribute towards greater demand for finance, which may feed through into the cost of finance.

Increases in prices may help consumers consider more demand side participation and the take up of energy efficiency measures.

Rising prices

The high levels of forecast investment in the future can be expected to contribute to rising prices for consumers, and the increases in network costs from recent determinations are already feeding through into customers' bills as the biggest driver of recent price increases. While prices send important signals to market participants and customers about actions they can take to mitigate their effect, e.g. greater demand side flexibility, they also lead to greater political pressure and focus on the value for money from the energy sector. There are four key factors that have driven increases in network costs:

- Replacement of ageing assets. Much of the electricity network in Australia was built 30 to 40 years ago, and is due for replacement.
- Demand growth, and particularly peak demand growth. The demand growth driven by Australia's strong economy is driving network expansion.
- State determined reliability standards. Over recent years a number of states have increased reliability standards thereby raising costs.[44]
- Cost of capital. The recent determinations by the AER and decisions by the Australian Competition Tribunal have increased the return allowed for companies compared to before the GFC.

Another key driver of expected future increases in prices would be the pricing of carbon emissions. This would be expected to have a particularly marked impact on electricity prices given that coal fired generation accounts for such a large share of generated electricity, although the shift in the type of generation would occur gradually over time. Increases in prices will occur without a carbon price as a result of coal contracts maturing (especially in New South Wales), switching from coal to gas for new generation plant, support for small scale renewable generation (such as Solar PV), the implementation of the expanded RET and other measures to address the impact of climate change. These increases in prices may help to encourage consumers to consider more demand side participation in the wholesale market and the take-up of energy efficiency measures, as they become relatively more cost effective.[45]

44 Essential Energy in New South Wales is an example of an electricity distribution company whose costs have increased significantly due to changes in the reliability standard.

45 Decisions by some governments to provide rebates to mitigate the impact of energy price increases could reduce the effect of these price signals.

Gas prices are expected to continue to be driven by demand from export markets, particularly in the Asia Pacific region. Switching to more gas fired generation, particularly for peaking generation, following the pricing of carbon emissions will also put more pressure on gas prices. In time Australia's east coast gas prices may move to export parity.

Market resilience

So far the NEM market arrangements have proven to be generally robust, but there are a number of factors that are likely to test the arrangements and wider energy market frameworks in the coming years. The high levels of forecast investment will require access to large amounts of capital, which may be challenging in the post-GFC environment where risk is priced more keenly by investors. While access to capital is unlikely to be an absolute barrier to investment, it may increase costs and make it more difficult for independent generators to finance investments.

The expected high levels of investment in renewable energy to meet the expanded RET, load growth, and over the longer term in response to any pricing of carbon emissions, will test the ability of networks to connect large amounts of new generation, at times remote from the existing networks. The introduction of much larger amounts of intermittent generation will also raise new challenges for AEMO as the system operator, such as managing a system with less natural inertia or greater potential for variations in the level of voltage.

So far the NEM arrangements have proven to be generally robust, but a number of factors are likely to test the arrangements and wider energy market frameworks in coming years.

Figure 2.5 below shows the relationship between temperature, wind strength and demand in South Australia. The figures show that generally when it is hot it is not windy, and when it is windy it is not generally that hot. However, the analysis is limited because it compares temperature and wind in the Adelaide area, whereas wind generation in South Australia is likely to be in areas further distant from Adelaide, which may affect the strength of the correlation. While the correlations will vary between the states, these relationships have implications for the need for conventional thermal generation to be available to meet periods of high demand, but also the potential that some generation would not be required at times of low demand because of the availability of wind generation.

Figure 2.5: The relationship between temperature, wind speed and demand in South Australia

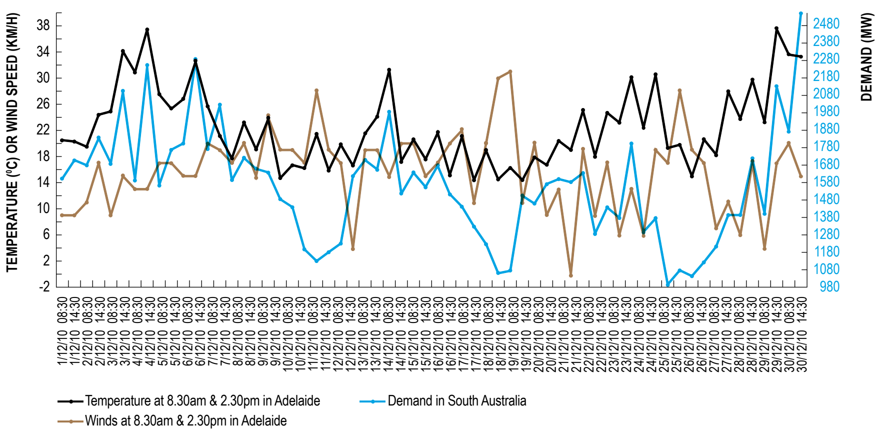
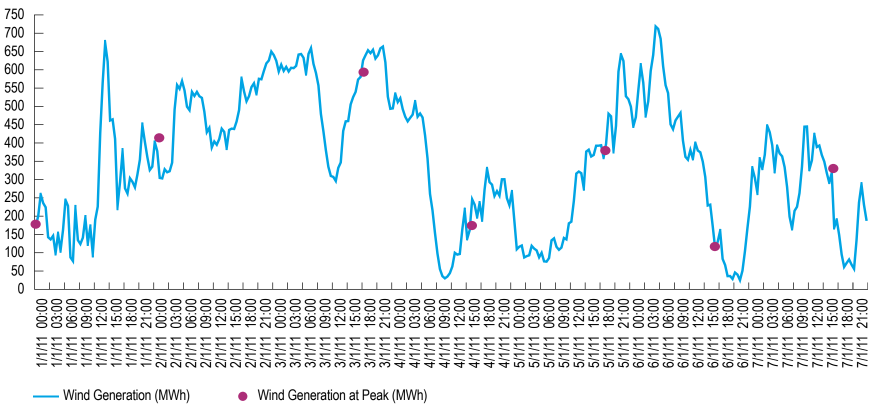


Figure 2.6 shows the total output of wind generation for one week in South Australia in January 2011 along with the point in each day when the system experienced its peak demand. This figure shows a weak relationship between wind output and peak demand, which implies the need for other generation to help meet peak demand.

Figure 2.6: Wind generation in South Australia – 1 – 7 January 2011



Expected changes in the mix of generation connected to the network are likely to increase price volatility.

The expected changes in the mix of generation connected to the network are likely to increase price volatility (as has already been seen in South Australia), and may lead to more periods of both high spot prices and negative spot prices.[46] This will increase further the importance for retailers and generators of hedging effectively in the contract market to avoid exposure to high and volatile spot prices. It also increases the importance of understanding potential systemic risks in markets like energy with financial contract products. Similar challenges may arise in the gas spot and contract markets if there is increasing use of gas as the fuel for peaking generation plant.

The range of challenges that the market structures will face over the next few years increase the importance of ensuring that the framework is adaptive, flexible and robust to meeting these challenges and other unforeseen physical and financial shocks.

46 For a number of reasons South Australia has experienced relatively volatile wholesale prices compared to other regions in the NEM over the last few years. See the AER's State of the Energy Market report for 2010 for more detail.

Summary

The challenges discussed in this section provide the context for the strategic priorities that the AEMC has identified for its work over the coming years. In the next three sections we discuss in more detail each of our strategic priorities and explain the main projects that we are undertaking to address these priorities.

While the strategic priorities proposed in the next three sections cover many aspects of the AEMC's work, the AEMC will continue to fulfil its responsibilities to consider rule change requests for the gas and electricity markets, and other requests for advice from the MCE.

As we discuss further in Section 6, we have focused our three strategic priorities on electricity sector issues because the stage of development in the gas markets is such that the focus is on monitoring and bedding down the new STTM, rather than wider market development work. However, we recognise the importance of monitoring how the new gas markets develop, and we will remain ready to respond to rule change requests or requests from the MCE for advice relating to gas markets.

The introduction of much larger amounts of intermittent generation will also raise new challenges for AEMO as the system operator, such as managing a system with less natural inertia or greater potential for variations in the level of voltage.

3. Strategic Priority One

A predictable regulatory and market environment for rewarding economically efficient investment

Why is this important?

We are entering a period of unprecedented new generation investment and the potential for plant retirements, so the investment environment will have a large impact on consumers' prices.

What are the issues?

There is significant uncertainty about the impact of climate change policies on the energy sector that may deter or delay required investments.

How are we addressing this priority?

We are working with and informing governments about the implications of policy settings on the energy sector, and undertaking projects such as retail competition reviews to identify opportunities to reduce regulatory uncertainty.

Introduction

The first priority we are seeking views on is the development of a regulatory and market environment that rewards economically efficient investment. This strategic priority responds to the investment challenge discussed in Section 2, and will have important implications for the future level of prices and market resilience. It also arises directly from the expected growth in demand, and particularly peak demand.

This priority focuses on investment in the competitive activities such as generation. The involvement of competitive demand side options in the market is discussed in the second priority.

In the third strategic priority we discuss the framework for the operation and development of the transmission network, and under that priority we discuss the economic regulation of transmission and distribution networks.

This section explains why we think this strategic priroity is important and outlines its key components. It also sets out our assessment of whether the regulatory environment is currently promoting efficient investment. This section concludes by identifying our current projects to address this priority.

Description

Energy supply is highly capital intensive and involves long-lived assets. Our energy markets operate on the basis that the necessary investment will be delivered commercially, rather than through central planning and direction. The environment for commercial investment is therefore critical. An environment that promotes efficient investment in generation and retail activities will be one that minimises the barriers to investing, and therefore allows companies to make the best commercial decisions possible. It is important to recognise that barriers can arise through the market rules for the NEM and the STTM or in wider policy settings, e.g. access to capital or uncertainty about whether and at what level a carbon price will be set.

A predictable regulatory environment is one in which the processes for regulatory change that might impact on investment returns are transparent, objective and well understood.

It is important to recognise that it may be necessary from time to time to change market rules to ensure that they remain fit for purpose and do not act as barriers to efficient investment. As discussed in Section 2, the pricing of externalities into investment decisions can also be an important component of helping to ensure that investments are economically efficient. However, a lack of clarity about the future pricing of externalities can also act as a deterrent to economically efficient investment.

Why is this priority important?

The environment for investment in competitive generation plant will have the biggest impact on future prices during periods when many investment (and retirement) decisions are being made. We are in such a period and are likely to remain so for a prolonged period of time, given forecast demand growth and the Federal Government's intention to reduce carbon emissions.

We need to recognise and build on the features of the current regime that promote economically efficient investment. This includes a predictable regulatory environment, price discovery through spot and contract markets and an ability to calibrate risks facing the investment and in some cases to hedge those risks.

Current status and issues to address

We need to recognise and build on the features of the current regime that promote economically efficient investment. This includes a predictable regulatory environment, price discovery through spot and contract markets and an ability to calibrate risks facing the investment and in some cases to hedge those risks.

While the contract markets provide an important means for price discovery, their relatively limited transparency can also lead to risks if market participants are unaware of, or do not fully appreciate, the overall market and systemic risks inherent in the trading that takes place. Although it is important to note that there are sources of information about aggregate contract market behaviour published by d-cypha trade, the AFMA and some brokers.

The frameworks will need to evolve as a result of climate change policies. The market mechanisms inherent in the Australian energy markets provide potential means to implement policies to address climate change for efficient levels of costs. Given the scale of investment it will be important to encourage as much capital as possible to be available to invest in the market.

Strengths of the current frameworks

A key strength for Australian energy markets are the processes for price discovery in wholesale markets, particularly electricity:

- There is a high degree of transparency over how AEMO establishes dispatch levels for generators, and therefore the calculation of prices. This transparency allows market participants to form expectations of future prices.
- The value of different types of contracts provides additional information on what types of investment are most economic. For example, a "cap" contract is insurance against very high prices – and therefore signals the value of "peaking" capacity. Although, as noted above, the relatively limited transparency about systemic risks in the contract markets can also create risks.

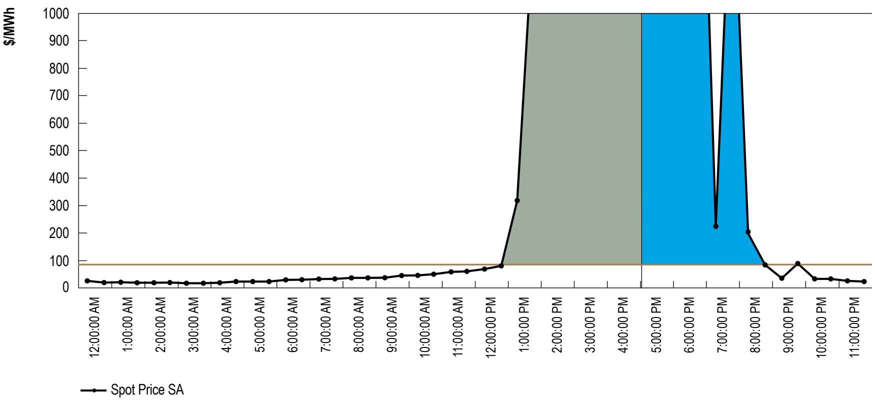
- Centralised, transparent pricing mechanisms are increasingly evident in gas markets also – with an example being the commencement of the STTM in September 2010, although a liquid contract market has yet to develop.
- While allowing the market price to clear implies very high prices at times of scarcity, this is important in signalling the value of new capacity – and the contract market (or decisions to "self-supply") provides tools to manage the resulting price variability and volatility.
- The potential impact on profits if businesses fail to manage spot price volatility effectively provides a key discipline on market participants. Effective competition at the retail level reinforces this discipline.

The following example illustrates the degree of exposure for generators operating in the NEM. It is an illustrative example for a power station in South Australia (capacity 540 MW, with one 265 MW unit and one 275 MW unit), under contract to supply 350 MW over 24 hours at $90 (weighted average) per MW. Figure 3.1 shows the risks to the generator from a technical failure.

Operating at full capacity, the generator has no difficulty in meeting its contractual requirements. The portions in grey and blue represent the difference between the contract price and the wholesale price, which is then profit (above the contract price) for the generator. However, if one of the units (275 MW) falls over (due to technical issues) at 5pm, the generator would be short of its contracted amount by 75 MW for seven hours. This is represented by the area in blue.

A number of concerns have been raised about the current framework and policy environment, including uncertainty about policy settings, implications of a changing market structure and limitations on the availability of finance.

Figure 3.1: Half hourly spot prices in South Australia on 19 November 2009, showing contracted amount, with 275 MW unit not operating



The blue section indicates where the generator is required to buy additional capacity from the market to meet its contracted requirements. This means that the generator would be forced to purchase 75 MW from the wholesale market at the spot market price for seven hours. This equates to a total of over $2 million, or $340,763 per hour.

The range of spot and contract market price information is signalling how resources should be allocated in the short and long term to deliver efficient investment.

Concerns about the current frameworks and policy environment
A number of concerns have been raised about the current framework and policy environment, including:

- Uncertainty about government policy settings;
- The implications for the contract market of the changing market structure, and in particular, vertical integration of generation and retail activities; and
- Limitations on the availability of finance since the GFC.[47]

We discuss each of these inter-related concerns in turn. These issues taken together have the potential to be significant barriers to entry to the competitive retail and generation activities in the NEM.

Uncertainty about government policy settings
Investors are accustomed to dealing with risk on energy demand, the spot and contract prices, and capital and operating costs. However, changes in the policy environment can create uncertainty which investors find hard to calibrate or to hedge. Changes to policy settings that appear to be quite small or doubt over limited aspects of policy settings can manifest themselves in significant uncertainty, particularly if they are perceived as indicating a general inclination on the part of policy makers to tinker with policy settings or delay decisions. The rules for competitive markets and network access, in the National Electricity Rules (NER) and National Gas Rules (NGR), need as far as possible to ensure a predictable regime within this changing policy environment.

The impact of changes in the policy environment are likely to make particular generation technologies significantly more – or less – profitable. The expanded RET came into effect this year, the Federal Government has recently established a Committee to review how best to put a price on carbon emissions which has led to an announcement of a proposed framework to introduce a carbon price, and there are a range of national and state based energy efficiency schemes and feed-in tariffs for certain types of generation. In the longer term, policy certainty and transparency about how policy settings can change will help to re-assure investors and allow access to a wider pool of capital.

The impact of changes in the policy environment are likely to make particular generation technologies significantly more – or less – profitable. In the longer term policy certainty and transparency about how policy settings can change will help to re-assure investors and allow access to a wider pool of capital.

The implications for the contract market of the changing market structure
Apart from some large industrial consumers, retailers are offering tariffs to customers under which the retailer bears the risk of wholesale market price volatility. Retailers can manage this risk either by owning their own generation (self supply) or through contracts with generators.

The increasing vertical integration of retail and generation activities to create gentailers may reflect efficient risk management decisions by these retailers, but it also has the potential to undermine liquidity in the contract market.[48] This will make it more difficult for new entrant independent generators to enter the market because of the lack of contracting options and for independent retailers to manage their risk. This manifests in providers of capital being concerned that the risks of investing are too high relative to the potential rewards.

47 It can be argued that the availability of finance before the GFC may have reflected an under pricing of risk, so it would be expected that better pricing of risk since the GFC would increase the cost and reduce the availability of finance.

48 From around the time of the GFC there has been a significant move to trading electricity futures through the Sydney Futures Exchange rather than OTC, which appears to be due to increased concerns about counter-party risk.

These concerns are not unique to Australian energy markets, but they raise significant challenges for policy-makers, and create risks that consumers pay more for energy than they would in a well functioning competitive market. However, it is difficult to develop robust policy settings that balance allowing efficient risk management with a competitive market structure.

Increased intermittent (wind) generation could lead to higher spot price volatility, with periods of negative prices and more frequent price spikes, as has been seen recently in South Australia. It may also require the availability of sufficient back-up capacity operating at low load factors which may feed through into higher spot prices. These impacts are likely to be concentrated in regions of the NEM with a favourable wind regime. These changes may require consideration of the adequacy of current rules for connection processes, ancillary service costs, and in providing the required capacity, as discussed under the third strategic priority.

Limitations on the availability of finance since the GFC

Since the GFC, while the amount of capital available for investment is increasing again, debt providers require greater equity and all investors have become more sensitive to country/sector exposure, and regulatory risk. These sensitivities are reflected in risk pricing. Established vertically integrated market participants who can finance investments from their own balance sheets are likely to have better access to finance than independent or merchant investors. Facilitating a broad range of sources of finance will increase competition to invest in the market.

Apart from some large industrial consumers, retailers are offering tariffs to customers under which the retailer bears the risk of wholesale market price volatility. Retailers can manage this risk either by owning their own generation (self supply) or through contracts with generators.

There are already some provisions in the NER and NGR for the provision of information to market participants to inform investment decisions, and policy-makers to inform their decisions. In particular, AEMO publishes annually separate Electricity and Gas Statements of Opportunities (ESOO and GSOO), which consider investment projects at various stages of development alongside forecasts of future demand growth, to indicate whether investment appears likely to be sufficient to meet future demand, and if not, by what date, additional investment is required. As we enter a period when investment in new generation capacity, and potentially gas infrastructure, is likely to increase significantly, it is helpful to consider how useful the ESOO and GSOO are for market participants and policy-makers. Do market participants make active use of the information within the publications when making investment decisions? Could the information be developed in a different way to increase its usefulness? Which types of decisions by policy-makers are the ESOO and GSOO being used to inform, and is the information as useful as it could be to inform these decisions?

Retail competition

Competition in retail markets is developing strongly in many states in Australia, and Victoria has removed price caps for its incumbent retail electricity businesses, reflecting the degree of competition. We discussed in previous sections that international comparisons suggest that Australia has four of the ten most competitive retail electricity markets. A churn rate of more than 25% a year in Victoria appears to show customers with a high degree of knowledge about their ability to exercise choice, and a willingness to exercise choice if they believe they can get a better deal from an alternative retailer.

Allowing the competitive forces in the retail market to determine prices will help to encourage market entry, as potential entrants will not be concerned that regulatory intervention could set price caps at a level that undermines the development of competition. The removal of price caps where competition is effective will be important for promoting investment in this sector. Once retail price regulation is removed retailers should have more confidence to contract on a longer term basis with generators as the risks associated with changes to the price cap undermining their decisions in the future will be removed.

Work program mapping

The following elements of the recent and current AEMC work program have or will help to address this strategic priority:

- The AEMC has reviewed the development of retail competition in ACT in 2010.

The following documents and processes also have relevance to addressing this priority:

- The Electricity Statement of Opportunities (ESOO) and Gas Statement of Opportunities (GSOO) published annually by AEMO.
- The annual National Transmission Network Development Plan (NTNDP) that AEMO recently published for the first time in December 2010.
- Annual Planning Reports published or comparable documents published by electricity DNSPs.

Addressing this strategic priority also requires policy makers to take actions that increase certainty, thereby reducing investment costs.

The AEMC will continue to monitor wider market developments, and provide advice as requested by the MCE, to help ensure that the wider environment for investment is as predictable as possible. This will help ensure that the costs of the extensive new investment in generation capacity, together with the required transmission connections, are minimised.

Summary

The AEMC will continue to monitor wider market developments, and provide advice as requested by the MCE, to help ensure that the wider environment for investment is as predictable as possible. This will help ensure that the costs of the extensive new investment in generation capacity together with the required transmission connections, are minimised, including by attracting as wide a range of sources of capital as possible.

The extent to which there is greater certainty about the Government's approach to policy areas such as when, how and at what level to put a price on carbon, increase over the coming years, investment certainty will be increased. It is important to recognise that certainty about policy settings will come not just from the introduction of the policy, but the extent to which the policy settings are expected to endure for a significant period of time.

4. Strategic Priority Two

Building the capability and capturing the value of flexible demand

Why is this important?

Cost effective demand side participation in the electricity market can help reduce the need for more generation and network investment to meet forecast increases in peak demand.

What are the issues?

Customers need to have sufficient information about possible opportunities to offer demand side participation, and confidence that the regulatory and commercial framework is robust.

How are we addressing this priority?

We will be undertaking a major review to identify any changes to the market conditions that are required to provide incentives for cost effective demand side participation.

Introduction

The second priority we are seeking views on relates to how consumers participate in the market, including offering demand reduction into the market and take-up of energy efficiency technologies. This strategic priority has the potential to mitigate the impact of rising prices for consumers, and to increase market resilience, particularly if more demand side participation is available at times of high demand. It also recognises the potential that energy markets will move from supplying gas and electricity as commodities to providing a broader range of energy services. This section concludes by identifying our current projects to address this priority.

Description

The supply-side of energy markets is structured and incentivised to meet the prevailing level and profile of demand during the day and across the year. To date electricity cannot be economically stored in bulk, the required amount of electricity supply infrastructure is highly sensitive to the level of demand at peak times. Even the most efficiently designed networks will involve significant amounts of capacity being underutilised at off-peak times. Demand reductions can, in some cases, be an alternative option to infrastructure development at various points in the supply chain. It can also mitigate price volatility at peak times, as a competitor to peaking generation.

Gas can be stored economically, in pipelines ('linepack') and in purpose-built storage facilities. This changes the nature and potential value of flexible demand – but does not detract from the main point that cost effective flexible demand, if harnessed, can have a significant positive impact on the reliability and efficiency of market outcomes.

There is evidence that commercial incentives provided by the energy markets are leading to reductions in consumers' energy demand. IPART has recently published a study showing that NSW electricity consumers have reduced their demand for energy in recent years. While it's not possible to definitely show causes, it appears that energy efficient appliances and improved home energy efficiency have been important.

An environment which is capable of capturing the value of cost effective flexible demand can be characterised as follows:

- Technically feasible – enabling consumption adjustments to be measured, and potentially controlled remotely in real time. Given the wholesale market in the NEM, many responses would need to be available and measurable for half hour price intervals or even five minute dispatch intervals.
- Contractually feasible – enabling transactions to occur around the value of flexible demand between the 'owners' of the flexibility (generally, but perhaps not exclusively, the consumer) and the parties for whom the flexible demand has commercial value. Aggregators (which may often be retailers) are likely to have an important role in allowing smaller industrial customers to offer demand side flexibility.
- Competitive – ensuring that flexible demand is used and rewarded appropriately for the benefits it provides. The variation in spot and contract prices will provide the key signals about the price at which flexible demand would be cost effective.

Realising cost effective demand side management will require:

- an understanding of what customers need to take advantage of the opportunities to provide demand side flexibility; and
- help to address what customers require.

There is already evidence that commercial incentives provided by the energy markets are leading to reductions in consumer energy demand. As discussed earlier, IPART has recently published a study showing that electricity consumers in New South Wales have been reducing their demand for energy in recent years. While it is not possible to definitely show the causes of this reduced demand, it appears that more energy efficient appliances, together with improved home energy efficiency, have been important contributors to the reduction in demand.

Why is this issue important?

If demand remains relatively unresponsive to costs at peak times (as assumed by demand forecasts in AEMO's ESOO), then more supply-side investment will be required and prices will be more volatile. This can be particularly important where there are significant differences between average and peak demands, because generation is required to meet the peak load and prices at peak demand times are generally higher to provide a return to the owners of such generation. Additional network capacity is also required to transmit the generation output at times of peak demand. Since 2005 peak demand has grown faster than energy demand in the NEM (3.5% compared to 1.2%).[49]

The generation mix in Australia is likely to see a rapid increase over the next decade in the level of intermittent generation such as wind and solar. The benefits from more flexible demand may be higher when there is a greater level of intermittency in supply because it can mitigate price volatility and the need for conventional generation to operate when intermittent generation does not operate. Consideration of efficient approaches now is therefore timely.

Although a range of stakeholders and market participants believe there is a lot of untapped potential for demand side participation, it is important to note that there has been limited quantification of the scale of cost effective demand side participation. AEMO estimated that there was 177 MW of load that is very likely to reduce consumption in Summer 2010-2011 in response to high prices, and 423 MW that had an

49 AEMO's 2010 Electricity Statement of Opportunities.

even chance of reducing consumption.[50] This is mainly industrial and commercial load, reflecting the limited take-up of demand side flexibility for smaller customers to date.

State government initiatives
Victoria's Government has already committed to requiring the rollout of smart meters into homes and businesses. Without appropriate technical, contractual and regulatory arrangements, the potential benefits of such meters may not be harnessed. Consumers will need to be given the information and tools to make use of the information and capabilities provided by smart meters. Smart meters are not an end in themselves, but a means to facilitate a range of measures that will allow customers to be more flexible in their demand patterns.

Similarly, there are a range of largely state based support schemes for small scale renewable energy projects, that are likely to encourage a significant increase in the scale of embedded generation. Although there have been changes to network charges to help ensure that such generation is appropriately rewarded for the network reinforcement that it helps avoid, it will be important to continue to ensure that the framework evolves to allow timely connection and provides appropriate financial rewards.

A key role for the AEMC is to pro-actively identify and remove barriers to effective demand side participation – allowing big and small energy customers to tailor their consumption in response to prices and power availability.

Energy efficiency
The Prime Minister's Task Group on Energy Efficiency has also recently published its report which includes a number of recommendations to increase significantly the take-up of energy efficiency measures in Australia. Amongst the recommendations is bringing together the current state based schemes to develop a national scheme to promote energy efficiency through retailers, and expanding the existing energy efficiency scheme for large energy users to cover transmission, distribution and generation activities.

As with the previous strategic priority of investment uncertainty, the key role for the AEMC is to pro-actively identify and remove barriers to effective demand side participation. This includes identifying the information and other requirements for consumers to effectively consider and take-up demand side participation. It will then be for consumers, retailers and other market participants to determine the forms of demand side participation and technologies to introduce based on their cost effectiveness. Such services may involve moving from supplying energy as a commodity to offering a range of energy services tailored to particular customers' preferences.

Current status and issues to address
We do not currently have a strong capability within the Australian gas or electricity markets for capturing the value of flexible demand. There are reasons to expect the lack of demand side participation to persist in the future given the current framework:

- The technical capability to accurately and verifiably measure consumption for specific periods of time is currently limited to a relatively small number of customers – although these tend to be the largest energy consumers who may have the most to gain financially from offering flexibility of demand;
- The commercial and regulatory framework to enable (the wide range of) interested parties to contract around the value of flexible demand is under-developed – with a number of critical questions apparently unresolved including the form and role of retail price regulation in

50 AEMO's 2010 Electricity Statement of Opportunities.

a 'smart grid' and flexible demand enabled environment, to send appropriate signals and provide adequate incentives for competition. There is also a lack of clarity about the scope for contestability in the services that can be provided with meter data; and
- Other developments – most notably a price on carbon – have the effect of increasing the value of flexible demand. Hence the cost of not having a strong capability to capture the value is likely to increase over time.

As discussed above, AEMO has found some evidence that demand can be responsive to high prices, and IPART has found evidence that consumers are reducing their energy demand, but for the vast majority of customers demand is relatively unresponsive to short term variations in prices. AEMO estimated price elasticities between -0.16 and -0.38 in the NEM, indicating limited responsiveness of demand to prices over the longer term.[51] This is understandable given:

- historically relatively low electricity prices;
- electricity and gas bills generally represent a small proportion of businesses' operating costs or the household budget;
- customers are generally on two-part (peak and off-peak) tariffs that do not closely reflect the pattern of spot prices, or actual very high or very low spot prices; and
- the costs of enabling more active responses (e.g. metering and control equipment, and the cost of monitoring price movements) are high for individual consumers relative to the current scope of potential benefits. To date residential customers have responded to overall retail price signals, including through purchasing more energy efficient appliances, rather than seeing and responding to shorter term spot price signals. While the potential benefits may be greater in absolute terms for some businesses, they may have costs associated with, for example, changing production processes before they could offer flexibility in their demand requirements.

Although ensuring clarity in the commercial and regulatory framework will be important, it will also be important for retailers, network service providers and AEMO to work together and discuss commercial opportunities to take advantage of the functionality of smart meters.

The roll-out of technology which remotely monitors and facilitates the control of consumption across a much wider range of customers – potentially all customers – changes the landscape for demand response. However, it is important to note that smart meters have a direct installation and maintenance cost, and depending on when and how they are introduced, may also indirectly lead to costs associated with stranded assets for existing meters. Technological change could also lead to the replacement of smart meters with updated models in the future. The introduction of time of use tariffs that can be facilitated by smart meters also has the potential to increase the differentiation of electricity prices across the day, and increase significantly electricity bills for some customers if they do not significantly change their consumption patterns. It is not clear that policy makers or retailers have so far communicated these potential impacts to consumers.

It is also important to recognise that the potential value from being able to monitor and control individual loads in real time runs right through the supply chain with:

- Customers (or agents acting on their behalf) able to manage their consumption more actively – including by being able to trade off lower costs against the potential inconvenience of accepting limitations on consumption at particular times;
- Retailers able to offer more sophisticated tariffs to more accurately differentiate between customer groups with different cost profiles;
- Network businesses able to use load monitoring and control as a means of improving network planning – and reducing or deferring the need

51 AEMO's 2010 Electricity Statement of Opportunities.

for network investment, and as a means of increasing the efficiency with which they operate their networks more generally;

- Retailers or aggregating agents able to sell demand response in the wholesale market as an alternative to hedge cover provided by peaking generation – hence providing a potentially highly significant new tool for managing price volatility if the demand response is verifiable and available when required; and
- The system operator able to use demand response as a means of maintaining system balance in addition to fast response generation.

But for these opportunities to be taken fully there needs to be a clear commercial and regulatory framework that is consistent across a number of policy objectives and levers through which interested parties can contract. This does not exist currently. This emphasises the importance of seeing the potential for greater demand side participation as not just an issue for retailers and customers, but an issue for the whole supply chain in the energy sector.

The role of the demand side in energy markets is arguably one of the biggest areas of untapped potential in the Australian energy markets.

Although ensuring clarity in the commercial and regulatory framework will be important, it will also be important for retailers, network service providers and AEMO to work together and discuss commercial opportunities to take advantage of the functionality of smart meters. Market participants will be the organisations that interact directly with customers to provide the services, so they have a particular responsibility to identify and explain the available opportunities.

The issues to address

There are many unanswered questions in respect of how such a regime can and should operate. Some of the questions include:

- Who owns the 'property right' to control loads – is it always the customer, or might it be the retailer or system operator (or the network business) in some circumstances?
- Given the potential for a lot of personal information to be generated about customers' use of energy and lifestyle choices, what are the appropriate protections to ensure that customers' privacy is respected and data is securely stored?
- What should regulated networks be obliged to do in respect of investment in, and providing access to, smart grid technology – and how should economic regulation be designed to provide the right incentives? While it is important to identify and remove barriers to particular technologies being developed, it is also important to be cautious about proposals which are intended to favour one particular type of technology. Incentives provided by well functioning competitive markets should allow those technologies that provide the greatest value to emerge and develop.
- What is the boundary between regulated and competitive activities in this space, and how should access and pricing be regulated across this boundary to promote competition and enable innovation and flexibility whilst providing appropriate customer protection? This includes challenges in moving from mandated to contestable services.
- Technology could create scope for network businesses (or affiliate businesses) to sell products in the wholesale market, e.g. load reduction sold as a hedge contract in direct competition with generators. There are significant concerns with such developments, absent appropriate ring-fencing and other competition protections.

If these, and many other related questions, are not addressed then opportunities are likely to be missed – and costs to consumers are likely to be higher.

The AEMC wants to ensure that there are no unnecessary barriers to cost effective demand side participation and development of energy efficiency measures. We want the market conditions to facilitate cost effective demand side and the offering of energy services products. We want to ensure that customers have the information necessary to make informed decisions about whether to offer demand side flexibility. This is an issue for the market rules and the wider supply chain.

Work program mapping

The following elements of the current AEMC work program will help to deliver improved outcomes for demand side participation:

- On 7 December 2009, the Commission published its Final Report for Stage 2 of its three stage review of DSP. The Final Report presents the Commission's findings on whether there are material barriers to the efficient and effective use of DSP in the NEM. The MCE has recently submitted the rule change proposals arising from this review to the AEMC for consideration.
- The MCE has asked the AEMC to carry out a further wide ranging review to identify and address barriers to demand side participation in the NEM (DSP3). This review will consider the incentives and barriers across the whole supply chain, including identifying the information and market conditions that customers need to enable them to offer demand side flexibility.

The AEMC's demand side participation review will provide advice on how the policy framework and the market rules can best be developed to remove barriers to demand side participation and create market conditions to allow customers, retailers and other market participants to take advantage of the commercial and cost effective opportunities that are available.

There are a number of other important initiatives being taken forward in the Australian energy market, including:

- In 2009 the Australian Government announced plans for a large-scale trial of 'smart grid' technology under its 'Smart Grid, Smart Cities' initiative which was awarded to EnergyAustralia[52] in 2010.
- In November 2009 the National Electricity Law was amended to provide for specific ministerial powers and consultation processes to be followed in respect of trials and roll-out of smart meters in jurisdictions of the NEM.
- In 2009 the Victorian Government legislated for the mandated roll-out by electricity distributors of 'smart meters' to all customers. Electricity distribution companies started installing meters in September 2009 and will finish by the end of 2013. The Victorian Government has put in place a temporary moratorium on the introduction of time of use tariffs to accompany the smart meters.
- The National Stakeholder Steering Committee on smart meters has submitted to the MCE proposed protocols and other information requirements to facilitate interaction between different market participants to obtain the benefits from smart metering.
- The report of the Prime Minister's Task Group on Energy Efficiency includes a wide range of recommendations intended to harness much more effectively the scope for energy efficiency measures in Australia.

Summary

The role of the demand side in energy markets is arguably one of the biggest areas of untapped potential in the Australian energy markets, although it has to be acknowledged that information about the scale of DSP in Australia has not been collected on a systematic basis in the past. The DSP3 review will provide advice on how the policy framework and the market rules can best be developed to remove barriers to demand side participation and create market conditions to allow customers, retailers and other market participants to take advantage of the commercial and cost effective opportunities that are available.

52 EnergyAustralia changed its distribution business name to Aus Grid in March 2011.

5. Strategic Priority Three

Ensuring the transmission framework delivers efficient and timely investment

Why is this important?

A large amount of new generation investment will be required to meet forecast increases in peak demand and respond to climate change policies. It is very important that we are confident the transmission framework can connect new generation and minimise overall system costs.

What are the issues?

We want to be confident that the arrangements for connecting to the network and for managing congestion within the network allow efficient use and development of the network.

How are we addressing this priority?

We are undertaking a major review of the transmission framework to assess whether the current arrangements could be improved to allow more efficient use and development of the network.

Introduction

The third priority we are seeking views on is whether the current framework for the provision of transmission services facilitates making the most efficient use of the existing network and delivers efficient and timely investment in new transmission to meet user's requirements. As part of this priority we discuss the economic regulation framework for transmission and distribution network service providers. This strategic priority contributes to addressing all the emerging challenges identified in Section 2.

The electricity transmission network provides the infrastructure that links the different regions of the NEM and allows electricity to be taken from power stations to very large customers and distribution networks, before being transported to final consumers. Therefore, a reliable and cost effective transmission service is crucial to the efficient operation of the electricity market.

This section describes this priority in more detail, outlines its key components and explains why we think it is important. It also asks some of the questions that need to be considered to determine whether the framework for transmission is currently promoting efficient and timely investment. This section concludes by identifying our current projects to address this priority.

Description

A framework that promotes efficient and timely investment in transmission assets and makes the best use of the available capacity in the existing network will have a number of key characteristics. These include:

- Ensuring that the capacity in the existing network is used as efficiently as possible with the costs faced by those parties that value using the network the most.
- Minimising the costs associated with managing the operation of the current network to meet system security, reliability and safety requirements.
- Timely investments in new infrastructure at locations that reflect expected future demand and generation capacity, by considering whether the benefits of investing outweigh the costs.

The operation of transmission networks and investment in new infrastructure requires an interaction between companies operating in a competitive market and regulated network service providers. Therefore, a robust framework requires that the monopoly networks have the right incentives to consider and meet the needs of consumers and generators in competitive markets. This will be through a combination of generators paying for the costs that they cause to be incurred such as direct costs of new connections, and applying appropriate cost benefit tests where users more generally will pay for new investment (socialising the costs). If the transmission framework interacts effectively with the competitive generation market it will help allow for the minimisation of total system costs.

The current regime allows generators who pay the direct costs of their connection to get a new connection to the network relatively quickly. The queues for new connections that characterise some countries are not currently an issue to the same degree in Australia's National Electricity Market.

Transmission assets have long lives and the potential to be useful for customers and generators far into the future. Therefore, when developing new infrastructure it is important to balance the risks of customers in the future paying for assets that may be underutilised, and the potential benefits from anticipating demand when considering the appropriate investments. This is a particularly important balance to strike in Australia given the potential for remote generation to connect to the network now and in the future.

Why is this priority important?

Although transmission accounts for a relatively small proportion of customer's bills (generally less than 10%), the transmission network provides the backbone for the inter-connected NEM and is the point of connection for all major power stations. Even with the development of distributed generation and the expanded RET, forecast load growth is likely to drive significant further investment in large scale power stations that connect to the transmission network.

Therefore, the ability of the transmission network to connect substantial new generation, potentially in locations remote from the existing network, in a timely and cost effective way will be crucial to meeting the Federal Government's environmental targets at reasonable cost. It is also very important that the transmission network remains robust and resilient to major changes in the mix of generation. The expected substantial increase in intermittent generation will present new challenges for TNSPs in operating and designing networks, and for AEMO in operating the power system. The need for real time balancing of supply and demand on the system poses particular challenges when generation levels can change substantially with little or no notice.

Current status and issues to address

Strengths of the current framework

The current framework for transmission has a number of important strengths that should be recognised and preserved.

There are incentives on the network service providers to ensure their networks are reliable and available for use by market participants. However, it has been argued that these incentives could be designed to better reflect the market impact, particularly on spot and contract prices, of network outages at particular times or locations.

The recently enhanced Regulatory Investment Test for Transmission (RIT-T) is intended to provide a framework to assess whether investments by TNSPs are likely to deliver sufficient benefits to outweigh the costs of developing them. It also provides a framework within which alternatives to network enhancements, such as demand side flexibility, can be considered. As the enhanced RIT-T has only just come into effect it is too early to fully evaluate how effective it will prove to be in practice, but the AEMC will continue to observe how it operates.

The current regime also allows generators who pay the direct costs of their connection to get a new connection to the network relatively quickly. The queues for new connections that characterise some countries are not currently an issue to the same degree in the NEM.

Investment and operational behaviour by networks has significant commercial consequences for generators, gas producers, retailers and customers.

The reliability of the transmission network has also remained generally very good. This suggests that the system operation and ancillary service arrangements have helped deliver effective system operation.

The AEMC has recently made a draft determination to introduce inter-regional transmission use of system charges (TUoS). This would mean that where electricity is transmitted from one region of the NEM to another, customers would pay a charge to recognise the benefits they get from using the transmission network in the other region to transmit the power. For example, if electricity flows from Queensland to New South Wales then customers in New South Wales will pay a charge for the use they are effectively making of the transmission network in Queensland. As we discussed earlier in Section 2, in 2009-2010 there were quite significant net flows of electricity between a number of regions in the NEM. The introduction of inter-regional TUoS charges should help to further promote a national electricity market, with cost reflective charges that help provide signals for more efficient use of the transmission network and signals about the best location for new generation.

Possible challenges for the current framework

Investment and operational behaviour by networks has significant commercial consequences for generators, gas producers, retailers and customers. The main impacts are:

- the terms for connection to the network; and
- the likelihood of network congestion which results in electricity generators or gas producers not being able to generate or flow their desired level of output.

Network congestion affects revenues, prices in the market, and the ability to sell forward contracts. The cost of network congestion as measured by the AER has risen over the last 6 years from $36 million in 2003 to $189 million in 2007-2008 and $83 million in 2008-2009, with approximately 50% of this cost attributable to network outages. This compares with total turnover in the NEM of approximately $9,400 million in 2008-2009.

Network investment to remove or reduce congestion may have significant impacts on the value of existing investments. Premature network augmentation could, for example, affect wholesale prices such that an otherwise efficient market investment becomes loss-making. It may also be efficient to allow some network congestion to remain over relatively long periods if the cost of building out the congestion outweighs reasonable expectations of the ongoing costs of congestion.

Several approaches to the provision and pricing of transmission have been trialled within the NEM. The use of merchant rather than network service providers has resulted in one lasting investment, Basslink, and two which have subsequently converted to regulatory status. An alternative approach to pricing constraints was trialled in the Snowy Region (constraint support pricing and contracts) prior to the abolition of the Snowy Region. In general however the framework for interaction between the wholesale market and networks has not changed materially. Indeed the main change to the NEM since market start, the abolition of the Snowy Region, has reduced the level of locational pricing.

The focus to date has therefore been on steps to assist generators in assessing the risks associated with transmission capacity in the short and long term. Measures taken include a defined process for investment decision making (the RIT-T) and steps to ensure better planning of network investments on both a state and NEM-wide level, and better provision of information to the market.

Over the coming year the AEMC will undertake a major project that fundamentally reviews whether the current services and framework for transmission is robust to meet the challenges of the future. This will include considering what services transmission should provide, the need for additional price signals and the opportunities for more flexible transmission services. This review will consider carefully whether there is evidence that the current approaches have significant shortcomings, and whether potential changes to the current approaches could help to improve the fulfilment of the NEO.

Over the coming year the AEMC will undertake a major project that fundamentally reviews whether the current services and framework for transmission is robust enough to meet the challenges of the future. We will consider what services transmission should provide, the need for additional price signals and the opportunities for more flexible transmission services.

We are also expecting to receive rule change proposals from the MCE to change the approach to planning by distribution networks. Given that providing the distribution network accounts for the majority of network costs it is particularly important that the framework delivers value for money.

Economic regulation of networks

Energy networks are regulated because competition is unlikely to be an effective discipline on company behaviour. Energy networks demonstrate features of ‘natural monopoly’.

Without regulation consumers would face the risk of networks being under-provided and over-priced. Some network activities are considered contestable, and are consequently regulated differently (and less). The principal examples are interconnectors and gas pipelines. In these cases contestability is generally provided by alternative fuels or infrastructure.

In this context, an enduring challenge for the design of all energy markets is how to integrate the regulated and the competitive parts of the supply chain – such that the overall cost of supply over time is minimised. We have a national framework for economic regulation of networks, under a common set of rules – overseen by an independent rule-maker (the AEMC) and regulator (the AER). These rules play a key role in promoting alignment between prices charged by network businesses and the efficient level of costs that would be incurred if these businesses were subject to competitive discipline. The framework also provides for more detailed incentive schemes linked to specific performance measures.

Australia relies primarily on incentive based regulation that gives network businesses incentives to deliver efficiency savings compared to revenues forecast and allowed by the AER. Networks that out perform the revenues get to keep these savings for a number of years (usually up to 5), and then customers should benefit from these efficiencies through lower prices in the future than would otherwise have been the case.

The design and operation of the rules is evolving, and it is important for them to be kept under review. For example, the AEMC is currently assessing the merits of having the option of using productivity benchmarks more systematically as a means of imposing additional discipline on network businesses.

There are also important procedural issues to be kept under review in the light of experience. We understand that the AER will take stock of its experience with the new regime and reflect on the framework and processes before the next cycle of distribution reviews commence. This will include rolling out a comprehensive, consistent reporting and data collection framework for all network businesses and a performance reporting framework that focuses on outcomes. A review of lessons learned will provide the basis for advice to the MCE and then discussions with the AEMC regarding any changes to the framework prior to proposing any rule changes. The role of the merits review, including the frequency and scale of issues bring referred to the Australian Competition Tribunal during price reviews, is another potential area of review.

The design and operation of the rules is evolving, and it is important for them to be kept under review.

Work program mapping

The following elements of the recent and current AEMC work program have or will help to address this strategic priority:

- In September 2009 the AEMC concluded a wide-ranging review on energy market frameworks in the light of the then proposed Carbon Pollution Reduction Scheme and expanded RET. These findings have been endorsed by the MCE, and the AEMC is currently processing the resultant rule changes, and in particular consideration of how to implement Scale Efficient Network Extensions.
- In September 2008, the AEMC concluded a review at the direction of the MCE on the establishment of a National Transmission Planner (as a function of AEMO) and the reform of the prevailing process for consultation and assessment of major transmission investments. These recommendations have now been implemented and the first National Transmission Network Development Plan (NTNDP) has been published by AEMO.
- In September 2008 the AEMC concluded a review at the direction of the MCE on the establishment of a common framework for transmission planning standards. The AEMC has recently updated the conclusions of this review and published a new final report.
- The AEMC has initiated at the direction of the MCE a review of frameworks for electricity transmission system access and pricing.
- On 28 September 2009 the AEMC concluded a review at the direction of the MCE on the framework for network planning by distribution businesses. The MCE has responded to these conclusions and will submit rule changes to the AEMC for consideration in due course.
- The AEMC is currently undertaking a self-initiated review on the merits of Total Factor Productivity (TFP) – a form of benchmarking – as an alternative or complementary basis for economic regulation of networks. Final conclusions will be reached in 2011.

The following documents and processes also have relevance to addressing this priority:

- The Electricity Statement of Opportunities (ESOO) and Gas Statement of Opportunities (GSOO) published annually by AEMO.
- The NTNDP published annually by AEMO.
- Annual Planning Reports published by electricity TNSPs, and comparable documents published by electricity DNSPs.
- The Regulatory Investment Test for Transmission published by the AER in July 2010, and Guidelines or other explanatory material published by the AER in respect of how the rules are to be applied.

Summary

The transmission frameworks review is a very important review to ensure that the substantial investment in new generation capacity that is expected over the next few years is overall least cost when considering generation and transmission. The AEMC will consider whether there is evidence to suggest that the current framework could be improved, and if so, how best to improve the framework.

The AEMC's Transmission Frameworks Review is very important in helping ensure that investment in new generation capacity over the next few years is overall least cost when considering generation and transmission.

6. Other work programmes and next steps

In addition to the work program discussed under each of the strategic priorities, the AEMC continues to consider a range of rule change requests affecting the gas and electricity markets. We also have an ongoing programme of work to review the development of competition in the retail markets on a state by state basis. This year's review was of the ACT market, and the final Stage 2 report was published in March 2011.

Gas markets

Our three strategic priorities at this time focus mainly on the electricity markets, although providing increased certainty for investment will also have benefits for gas markets, including investment in gas production, gas fired generation and network infrastructure.

We have not identified a strategic priority relating to gas at this time because of the stage of development of the gas markets in Australia. The AEMC has only been given a rule making role with regard to gas markets recently, and the STTM hubs in Adelaide and Sydney have only been operating for a few months. Furthermore, implementation plans are already well advanced to extend the STTM with a hub in Brisbane. Therefore, at this stage of the development of the gas markets our role is primarily to monitor and understand the development of the markets, and process rule changes arising from any initial problems identified with the markets, rather than considering any more fundamental or strategic changes to the markets.

The NGR includes provisions for AEMO to undertake reviews of different aspects of the STTM over the coming years. AEMO has recently submitted a rule change proposal to change the structure and timing for some of these reviews. The reviews to be carried out by AEMO will provide an assessment of how well the STTM is working, and therefore highlight any major issues that need to be addressed. In the meantime, we will continue our role in considering rule changes for the gas market as and when they are proposed.

We want the development of our strategic priorities to be a collaborative exercise that provides stakeholders with an opportunity to comment on our suggested strategic priorities and identify any issues we have missed. We welcome comments on this discussion paper.

Market resilience

Addressing our three strategic priorities will in different ways help to assess and improve market resilience. Increased certainty for investment in generation assets will help improve security of supply in the longer term. Facilitating more demand side participation could provide more cost effective options to mitigate demand peaks than further investment in network capacity or peaking generation plant. Considering whether the transmission framework is robust will help ensure that sufficient generation connects to the network in a timely manner to provide security of supply.

However, market resilience has other components, and in particular, resilience to unforeseen physical and financial shocks. Major supply interruptions can impose significant economic and social costs. These costs may not be fully internalised in business decisions. At some point the cost of delivering incremental improvements to the reliability and security of supply will outweigh the value placed on these improvements by communities and businesses. Markets also need to be capable of standing up to extreme or unforeseen commercial events – and should not precipitate them. Developments in global financial markets illustrate the potential impacts of markets that are not internally resilient.

Although reliability has generally been very good since the start of the NEM, we have seen some events that have led to supply disruptions, and other countries have experienced supply disruptions due to physical events, such as in Auckland's business district a number of years ago. There are a range of provisions within the NEM to help ensure robustness to physical shocks. Increasing price volatility as a result of increased intermittent generation connected to the NEM is an example of changing risks for generators and retailers that could lead to unforeseen financial shocks.

In a period of potentially rapid change to the underlying costs of energy markets, there are enhanced risks of unexpected commercial events. It is prudent to consider what mechanisms are in place to limit the extent of disruption to markets as a whole if individual market participants are commercially distressed. The GFC has illustrated that markets with complex contract structures have a range of complex interactions and may raise concerns of systemic risk, particularly in contract markets that are characterised by limited transparency compared to spot markets.

The AEMC has undertaken some projects in recent years that contribute to improving the resilience of the markets, and AEMO has been undertaking a review of the NEM Prudentials Framework. We will continue to monitor and improve our understanding of market resilience to identify any further measures that are necessary to further improve market resilience, particularly resilience to unforeseen shocks. We would also welcome stakeholder input on these issues.

Consultation

We want the development of our strategic priorities to be a collaborative exercise that provides stakeholders with an opportunity to comment on our suggested strategic priorities and identify any issues we have missed. Therefore, we would welcome comments on this discussion paper, and particularly about the three strategic priorities that we have identified.

Comments should be sent to submissions@aemc.gov.au by Friday 13 May 2011.

If you have any questions about the issues raised in this discussion paper please contact Paul Smith, Senior Director, on 02 8296 7800 or paul.smith@aemc.gov.au.

Next steps

Once we have reviewed the responses to the consultation and considered the feedback from the public forum, we will publish details of our final strategic priorities and confirm the work programme to deliver each priority.

It is our intention that the development and updating of our strategic priorities should be an ongoing exercise, with a formal updating of them each year, through a consultation process with stakeholders. This will also allow us to regularly update the MCE on our view of the strategic priorities for the energy sector and our work. Therefore, next year we will again issue for consultation a discussion paper on our updated strategic priorities and the work programme to deliver those priorities. We may also, during the year, issue other documents that update on progress with delivering specific strategic priorities or our work programme.

Once we have reviewed the responses to the consultation and considered the feedback from the 1 April 2011 public forum we will publish details of our final strategic priorities and confirm the work programme to deliver each priority.

Notes: