Presentation to the Maddocks Energy Lunch
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This speech by Mr Pierce was presented to a private luncheon held in Sydney by the national legal firm, Maddocks, on 27 October 2011.

Introduction

Thank you for the opportunity to speak to you today. I am grateful for the invitation from Alan Stockdale and the Maddocks team more broadly.

I will discuss today some of the issues and questions that the AEMC considers need to be addressed within the Australian stationary energy sector, and some of the work that we, together with Governments, other agencies and industry are undertaking to address those challenges.

On the night of the Commonwealth budget in August 1993, I was facing a difficult decision. Would I listen to the budget speech or attend the RC Mills Memorial Lecture at Sydney University, being delivered by a visiting economic growth theorist, Professor Luigi Pasinetti, from the Catholic University of Milan?

This choice of how to allocate a non-renewable and valuable resource - time - between the immediate and the *potentially* important is one we all face repeatedly. It is a question of priorities. As it turns out, 18 years later I can recall far more of Passinetti's lecture than I can the Treasurer's.

After discussing the nature and drivers of structural change in the economy and the role of technical progress and productivity growth, Pasinetti commented, somewhat prophetically, that:

> "intricate problems of structural dynamics are particularly going to become important here in Australia… In the next decade, or even few years, those who are responsible for the Australian economy will have to make crucial decisions as to the mix of strategies that concern the size of the economy, the speed of population expansion, the size of productivity raising investment, the extent of exploitation of the natural resources; the branches of production to pursue and diversity, or to close down. The real crux of the matter is that the new channels should be singled out and pursued *before* the old ones are doomed to extinction, not the other way around."[1]

Pasinetti's description of economy wide issues in 1993, I think you will agree, ring true today, particularly when we look at the issues facing the energy sector in 2011.

Structural change, i.e. the movement of people from one type of job to another and capital from one type of investment to another - in response to changes in technology, relative prices, consumer preferences and dare I say government policies and regulation – is a normal, continuous and dynamic process. In fact it is a necessary one. The task for institutions such as the Australian Energy Market Commission – be it with our statutory rule change hat on or in our policy advisor role – is to understand the drivers of this process, adapt to them ex-ante and facilitate and help manage the adjustment process in the long term interests of consumers.

[1] Luigi Pasinetti (1993) "Technical Progress & Structural Change" R.C. Mills Memorial Lecture, Economic Papers Vol 12 # 3 pages 1-10.

The notion that there will be changes in the way energy is produced, transmitted, distributed, controlled, marketed and consumed is hardly a radical one. It's been happening since Edison was a boy. Nor is the idea that structural change is necessary in order to gain the benefits of, and drive, productivity growth. Nevertheless, these changes throw up a number of issues and there are choices to be made about how we respond to them and prioritise them.

This is essentially what the Strategic Priorities for Energy Market Development released last week by the AEMC – and the process of engagement with stakeholders leading up to its publication – seeks to address.

What are the challenges, issues and opportunities that have the biggest impacts on the sector's economic performance and consumers in the longer term? What are the three most important things we can do about them?

Clearly identifying priorities allows us to focus on the work that has the greatest pay offs. Any more than three:

i. efficient generation investment;
ii. demand side participation; and
iii. network regulation,

and everything risks becoming a priority which means nothing is . . . and nothing gets done.

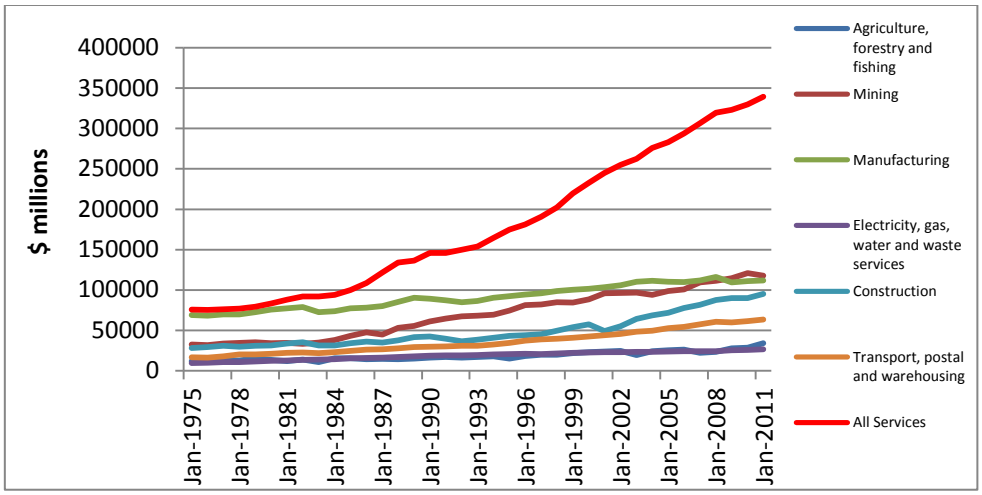
The demand for energy is a derived demand. It is derived from almost everything that goes on in our society and economy. The reliability of energy services and the efficiency with which resources are deployed to provide those services has significant flow on effects for the performance of the whole Australian economy.

As you know, Australia has traditionally enjoyed relatively low cost electricity and gas. Underpinned by our relative abundance of primary fuel sources, it has shaped our economic and industry structure. However, in addition to these natural advantages, policy initiatives such as the National Electricity Market (NEM) itself, have enhanced the productivity and efficiency of the stationary energy sector. Policy choices can, of course, also do the opposite.

Be it a rule change, such as that recently proposed by the Australian Energy Regulator with respect to network regulation, or a policy intervention such as the mandating of so called 'smart meters' or various climate change policies, a core question that needs to be answered is "How will this impact on the productivity and efficiency of energy services?"

In answering this question it is worth remembering that 70% of this stuff is not consumed in the residential sector.

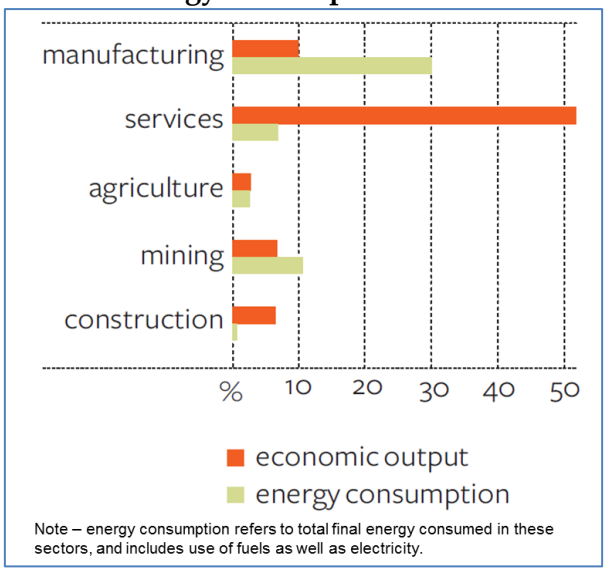
Slide 1 – Industry contribution to GDP



Source: Australian Bureau of Statistics, 5206 Australian National Accounts: National Income, Expenditure and Product - Gross Value Added by Industry.

A noticeable Australian economic trend over the last 20 to 30 years is the increasing contribution of the service industries to GDP growth. While all other primary and secondary industrial groupings have increased, the service industries have more than tripled their contribution to total Australian GDP. This has profound implications for the way that Australia uses energy.

Slide 2 - Shares of total Australian energy consumption and economic output: 2005/06

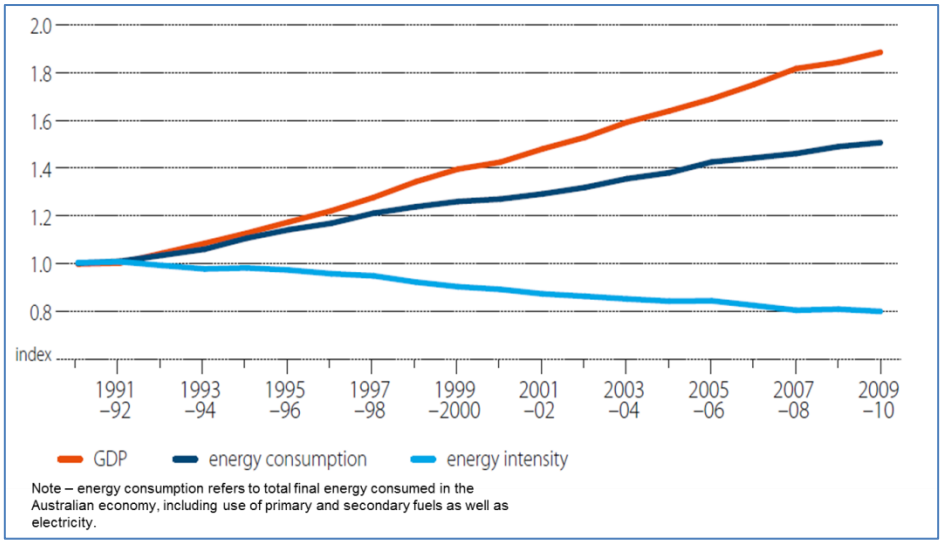


Source: ABARES, Trends in energy intensity in Australian industry, p.4.

As we can see, the energy usage of services industries is low in comparison to other industries, while their level of economic output is clearly significant.[2]

[2] This data sourced from ABARES, *Trends in energy intensity in Australian Industry*. This document examines energy intensity of the Australian industrial and commercial sectors. The energy use of these sectors makes

Slide 3 - GDP growth, energy usage and energy intensity



Source: ABARES, Energy Update 2011, p.26.

So, while overall GDP growth has increased, energy consumption has increased at a slower rate, and the overall energy intensity of all Australian production has in fact decreased. This is likely to be a continuing trend.

When I started working in the Electricity Commission of New South Wales, the standard electricity consumption growth number for planning purposes was in the order of 6% p.a. By the late 1980's it had become 3%to 4% and for sometime now it has been in the order of 2% p.a., with some evidence emerging that it may be tracking lower.

Now while growth rates vary between regions, the point is that changes in the *structure* of the economy over time have and will impact on energy consumption growth rates. If you are contemplating policies designed to impact on energy consumption, you might like to be aware of the underlying structural dynamics.

As Australians have become wealthier and economic output has expanded, *levels* of electricity consumption have generally increased, if at a declining rate, due to these changes, in the drivers of growth.

However, perhaps more importantly from the viewpoint of productivity and prices (and hence how the electricity sector feeds back and impacts on the economy), the way we consume electricity has changed.

Despite improved energy efficiency of many household appliances, increased wealth and incomes mean that we have more of them, with a consequential deterioration in load factors – that is, peak demand has been growing faster than average demand or energy growth. For example, the Australian Energy Market Operator (AEMO) has estimated that while average electricity growth across the NEM regions will increase by 2.3% per year out to 2020, maximum demand will increase at around 2.6%.

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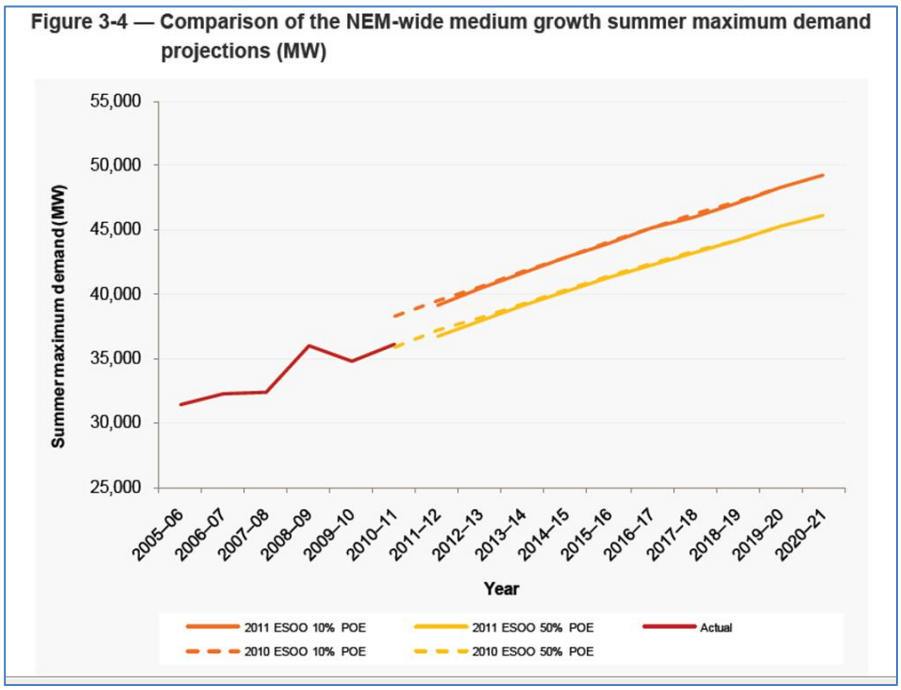
up 51% of Australia's total energy consumption. The remainder is consumed in the transport (37%) and residential (12%) sectors.

Slide 4 - Peak Demand Forecasts



Source: AEMO, 2011 Electricity Statement of Opportunities, p.3-12

As peak demand periods tend to be of very short durations, the additional capital invested in networks and to some extent generation, has relatively lower levels of utilisation. As network costs have been the primary driver of recent retail price increases, a core question has become "How can energy services in terms of cooling, heating, lighting etc be maintained while increasing the utilisation of the capital invested in network infrastructure?"

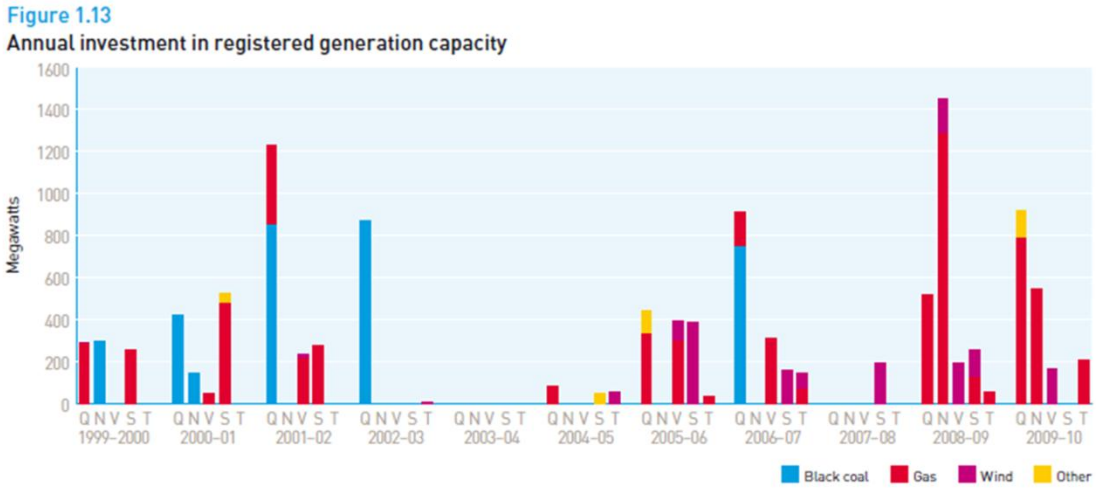
Performance of the NEM since market start

The wholesale NEM as we now know it had a rather long but relatively orderly gestation and implementation period. At least it appears so from today's perspective. Despite some views I have heard, its development commenced prior to Alan Stockdale coming to office, though the pace certainly quickened after he did.

The process of development and management of its implementation certainly deserves to be fully documented as a case study of successful policy implementation – but that is a story for another time. The first issue we faced when developing the NEM, concerned how to co-ordinate efficient dispatch, that is production from various power stations using price signals rather than via centralised direction from system control engineers. Various trials and experiments with different means of exchange and contract forms were undertaken in New South Wales and Victoria prior to the integration of these two regions. These trials and experiments meant that when the NEM commenced we could be very confident that the wholesale market could work, at least in the operational sense – and that the 'lights would stay on'.

What you could not trial or experiment with were real investment decisions.

Slide 5 – Investment since market start.



Source: AER, State of the Energy Market 2010, p.38

Investment challenge

AEMO has estimated that between 40 and 130 billion dollars of new investment in generation will be needed by 2030, depending on the scenario that you pick. To put this in context, we estimate that around 12 billion dollars of generation investment has occurred in the 12 years since market start. The scale of this investment requirement is challenging in itself. It is exacerbated by the situation that capital markets find themselves in, and market uncertainty around climate change policies.

It is important to note that investment is likely to continue, even in a climate of significant market uncertainty. However as Grant King, Managing Director of Origin Energy, recently explained, investors will generally seek to minimise their capital exposure when making investment decisions in such a market. For the energy sector, this is likely to result in investment in relatively low capital cost, high operating cost plant, such as peaking plant, rather than more capital intensive base load generation.

If such a mix of plant proves not to be the lowest cost in the long term, customers will pay through higher prices than otherwise would have been the case.

Irrespective of your view of what is going to happen to future demand or the *types* of investment that will be required in future – or the balance between demand and supply-side investments – relative to the past, the investment requirements for the reliable provision of energy services will be large.

Given this, a core question is "what policy and regulatory settings do we need to make investment in this sector, or this country, an attractive proposition?"

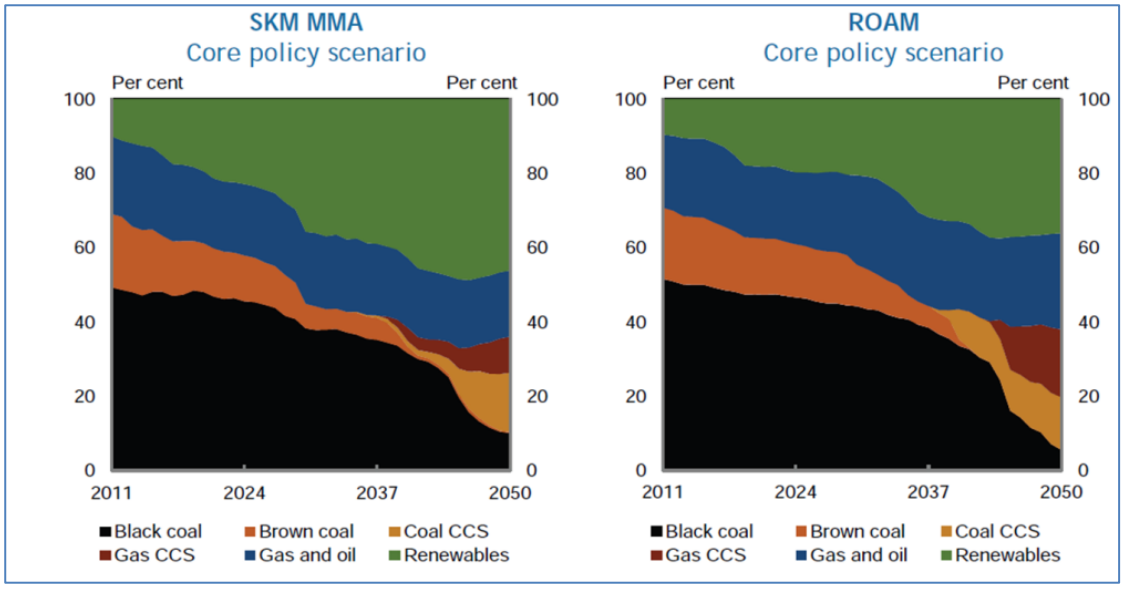
Adjustments to meet climate change policy objectives:

Delivering the objectives of climate change policy will have major implications for the way in which we generate and transport energy. Work undertaken for the Commonwealth Treasury suggests that by 2050, nearly half our energy supply will be met through renewable generation, while coal will contribute around 20%. To put this in context, almost 80% of our electricity is currently sourced from coal fired generation, while renewable generation makes up around 8%.

Whether we agree or not with the Treasury's precise view, the direction of the shift is the key issue.

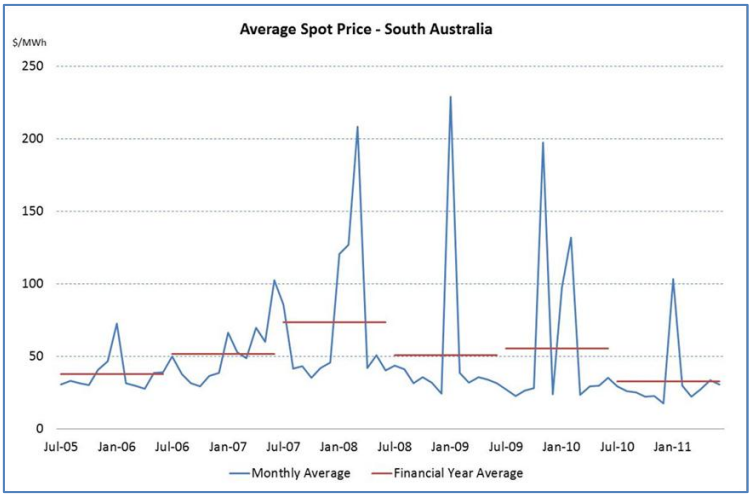
The challenges of managing this transition are far from trivial. For instance, there are significant issues involved in managing a power system dominated by intermittent renewable generation.

Slide 6 – Changes to generation mix under a carbon price



Source: Treasury, Strong Growth, Low Pollution: Modelling a carbon price, p.116

Slide 7 – South Australian Wholesale Prices (1)



Source: AEMO market data

A consequence of large volumes of intermittent generation is the impact on wholesale spot prices. In South Australia, significant levels of wind generation have contributed to depressing average annual spot prices to their lowest level since market start, while contributing to the significant volatility in prices in that region.

Slide 8 – South Australian Wholesale Prices (2)

Year	Number of half-hour prices – South Australia			
	above $5,000/MWh	above $300/MWh	below $0/MWh	below -$300/MWh
2006	1	62	1	0
2007	3	78	10	2
2008	52	78	51	3
2009	50	97	93	8
2010	24	58	139	18

Source: AEMO market data

As you can see, South Australia has also seen a significant increase in the number of periods when prices have dropped below zero dollars. These are periods where generators are actually *paying* to generate.

While a price on carbon will eventually drive investment and disinvestment decisions, it is the Renewable Energy Target which is currently responsible for the majority of new renewable generation. The kind of depression of wholesale prices seen here has the capacity to defer investment in high capacity factor generation and make the economics of existing plant very challenging.

Some would regard such an outcome as a positive, however it should also be acknowledged that it drives a wedge between wholesale and retail prices, and drives them in the opposite direction.

Changing industry structure

Since market start, participants have developed various strategies to manage risk – market risk being quite different to policy and regulatory uncertainty.

An increasingly dominant strategy is vertical integration of retail and generation businesses. Vertical integration represents a logical risk management strategy.

Possessing both generation and retail arms provides businesses with a natural physical hedge, provided your generator can actually generate when you want it to.

I have no problem with vertical integration per se . . . it is all a question of degree.

Balanced gentailer businesses have less of a need to buy or sell wholesale contracts resulting in a reduction in liquidity. This can have competition implications.

An industry structure characterised by a relatively small number of vertically integrated and balanced players will also be one characterised by high barriers to entry and exit. Again with productivity and price implications for consumers.

Policy uncertainty and inconsistency has the potential to exacerbate this trend, if new investment can realistically only be funded by a small number of existing vertically integrated players.

Gas and electricity market convergence

For an example of structural dynamics in practice, we need to look no further than the east coast gas industry. Development of coal seam gas prospects and related LNG facilities will allow for the export of significant volumes of gas.

The convergence of increased demand for gas-fired generation, with east coast LNG facilities producing perhaps three times as much as Western Australia and the Northern Territory, will create a number of issues for the domestic stationary energy sector. The price of domestic gas, once you can get a long-term contract, may come to reflect international prices. We will need to manage a situation where domestic electricity prices become linked to international outcomes.

Security of the gas system will also increasingly affect the supply of electricity. As we saw in Western Australia in 2008, system emergencies can rapidly constrain the availability of gas to a large number of consumers. In an electricity sector with high gas generation penetration, such an event could have additional security of supply implications.

The next stages of reform for the stationary energy sector

The AEMC's Strategic Priorities highlights the key areas where there are opportunities to respond to the structural challenges facing the energy sector. We have adopted a "broad church" approach when consulting on these priorities, as it is important to ensure that all viewpoints and inputs are considered.

The first of the strategic priorities is the need to develop market and regulatory frameworks which reward economically efficient investment. For the economy as a whole it is important that the market frameworks encourage investment decisions on both sides of the meter which deliver energy services at the most efficient cost.

This strategic priority is related to the need for policy consistency and certainty. Reducing uncertainty in a marketplace encourages the availability of funding for new investment. It also allows participants to make better investment decisions.

The AEMC is progressing a number of rule changes and reviews related to this issue. For example, our work on the effectiveness of competition in energy retail markets and on the extent of generator market power in the NEM.

Our second strategic priority relates to building the capacity and capturing the value of flexible demand.

Demand side participation (DSP) has the potential to deliver a number of benefits. An active demand side can help to reduce the need for new investment in networks and generation to meet changing demand patterns. It may also be used to address some of the issues related to increased penetration of intermittent generation, by offering an alternative to investment in peaking generation to address rapid changes in supply.

The AEMC's Power of Choice Review will examine this issue in detail. Adopting a whole of supply chain perspective, the review will seek to make recommendations on how any customers can be given the tools to take advantage of these opportunities.

The final strategic priority relates to the regulation of transmission and distribution networks. The prospect of investment in new types of intermittent generation in remote locations will create new issues in regards to connection and augmentation of the network and also create challenges for system operators.

Network costs have been the primary driver of recent retail price increases, and are forecast to continue to be the major contributor in the medium term. As significant new demands are placed on the frameworks governing network investment, it will be important to ensure that this investment occurs for an efficient cost.

The AEMC's Transmission Frameworks Review is examining the effectiveness of existing access, congestion, connection, charging and planning effectiveness of existing arrangements. We are also progressing a review of distribution reliability standards.

The AEMC is also considering proposed changes to the Rules, brought forward by the AER, which are related to the economic regulation of networks. In assessing potential changes to these Rules, we will be seeking to ensure that the productivity of networks is maximised through the development of effective regulation.

Ultimately, the reform of energy markets is the prerogative of government. While the AEMC will continue to provide advice and highlight priority areas, a co-ordinated effort of unity and purpose will be needed to effectively implement improved outcomes.

Industry participants will have a vital role to play in this process, and I look forward to working closely with many of you over the coming years on these issues. While much has been achieved in the Australian energy sector over the last 20 years or so, there continues to be much still to be done to help ensure that the sector makes the greatest contribution that it can to the economic growth of the country.

Thank you again for the opportunity to talk to you today, and I am happy to take questions.

Ends