AEMC

CATALYSTS FOR REFORM IN THE ENERGY MARKET – NO HOLDING BACK

KEYNOTE ADDRESS

DR BRIAN SPALDING
Commissioner, Australian Energy Market Commission

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Introduction

Thank you to Jeff for the invitation to speak today, I really appreciate the opportunity.

The conference theme today "adapting to the major changes that are reshaping the electricity industry". And it's a very fitting topic for me to be speaking on, because at the AEMC (Australian Energy Market Commission) that's what we do.

We adapt regulatory framework to changes in the energy sector. We're seeing changes in technology, we're seeing changes in consumer preferences in how people use electricity and we're seeing changes in government policy.

Today I'm going focus on a couple of key areas.

- I'm going to give you a fairly quick overview of energy governance; that is the roles and responsibilities that underpin the decision making in the energy market.
- I'll then talk about some of the specific changes that have been the catalyst of key reforms in the energy rules.
- Then I'm going to spend a little bit of time focussing on security and reliability and why it's important to know the difference.
- This will then lead me to a bit of an update of the Finkel recommendations. I'm going to focus on some of the ones the AEMC have been responsible for.
- Then I'm going to finish off by telling you our focus on the next 12 months.

National governments and energy policy development

The national electricity market governance structure was designed to deliver effective competition and support investment in the energy sector. It does this by deliberately assigning separate roles and responsibilities to a number of different decision makers. At the top we have the Council of Australian Governments which is chaired by the Prime Minister and the Premiers attend

that. First ministers delegate the key energy policy role through to an energy council which is made up of the energy ministers for all the jurisdictions and is chaired by the Commonwealth. It's not surprising that we have energy included in the COAG arrangements because the constitutional responsibility of energy rests with the states, not the Commonwealth Government. And yet obviously the Commonwealth Government has a clear interest in energy because it has such an important influence on the economy overall.

The governments that make up the COAG Energy Council also make the laws that are relevant to energy. That's the National Electricity Law, the National Gas Law and the National Energy Retail Law. And under the COAG arrangement are the three market bodies. Each market body has specific roles and functions and are responsible for making specific decisions about the day to day operation, regulation and design of the market.

Market body roles

We have the operator, AEMO who is in charge of the day to day operations of the power system and the electricity spot market, and also parts of the gas system.

Then we have the regulator, the AER which is charge of setting the regulated rates of return for the network businesses, probably close to a lot of your hearts, and also in policing the industry to make sure everyone is playing by the rules.

Then we have us, the rule maker, the Australian Energy Market Commission. We make and amend rules to adapt the energy market design as the world changes. We also provide advice to governments to help and inform their decisions in relation to energy policy, unfortunately advice isn't always taken! Our rules have the force of law and as long we can show how a change can benefit consumers over the long time on term, we are able to make changes to the rules.

In addition there has also been an energy security board established following the Finkel review, and that as be established to oversee and coordinate the implementation of the Finkel recommendations.

The last body I want to talk about under the governance structure is the Reliability Panel, which is established under the National Electricity Law and it's a body that forms part of the AEMC's institutional arrangements and is comprised of ten senior members who represent a range of participants in the national electricity market (NEM) including consumers. Panel representatives are typically chief executive level or direct reports to chief executives.

The key responsibilities of the Reliability Panel include monitoring, reviewing, reporting, and giving advice on the safety, security, reliability of the national electricity system. In particular they recommend what the reliability standard should be for the national electricity market, together with the related market settings that drive reliability outcomes such as the market price cap, the

cumulative price threshold and the administered price floor. The Panel also determine a number of guidelines that market participants and AEMO must comply with.

Technology driving change in the power system

The electricity system in Australia is transforming as newer types of electricity generation such as wind and solar connect, and conventional forms of electricity generation such as synchronous coal fired power generation retire.

In addition the formerly passive demand side is become increasingly engaged in energy markets through the uptake of new technologies and services such as solar PV, storage and demand response.

These changes have been driven by a variety of factors, including not only technological progress and the commercial realities of aging plant but also consumer preferences and government policies.

New technologies are changing the way consumers draw electricity from, and export electricity to the broader power system. In addition generation technology is changing and it's also changing the way the power system behaves. We've had 100 years or more experience (not me personally although I've had 50 years which is not quite as long), in synchronous generators that are magnetically coupled to the spinning electricity power system. But they are also dispatchable with known bounds and we understand their performance, their modelling and their load.

Now we are seeing electronically inverted generators, which have variable output. While some of this technology has been around for almost 20 years we have only had one or two year's experience with this sort of plant connecting at scale to the power system. This transformation presents both opportunities and challenges for power system security and reliability.

Reliability and security: different challenges, different solutions

Now I'm going to spend a little bit of time explaining these two terms. We need to be clear on the distinction between reliability and security, because the way they are delivered is very different.

A power system is secure when it's operating in a satisfactory operating state and, following a credible contingency, remains in a satisfactory operating state. A satisfactory operating state is when the power system has all its technical parameters; voltage, frequency, current flows; within bounds, within equipment ratings and is under control. That is the oscillations are being damped out. And it must remain in that satisfactory operating state following a credible contingency. That is the definition of a secure power system or power system security. It has nothing directly to do with supplying consumers.

Reliability on the other hand, is having enough generation equipment, enough demand side response and enough major transmission to supply the consumers' needs – now that's about the consumer. So security is about the technical power system, reliability is about supplying consumers when they need to be supplied.

Reliability is mostly driven by market processes of investment. Whereas security is mostly driven by the power system operator, mandated equipment performance standards, and network design through regulation and obligations.

Our analysis for the Reliability Panel in late 2017 and early 2018 shows that the reliability standard was met in the national electricity market for all years following 2008/2009 and is projected to be met in all regions in the near to medium term. Although, AEMO has recently noted concerns that without intervention there may be some unserved energy in Victoria next summer.

It's useful to note however, that information released to the market about future breaches to the reliability standard should not necessarily be cause for concern. In fact the Electricity Statement of Opportunities published by AEMO annually, regularly forecasts breaches in the reliability standard, which, in the fullness of time do not generally materialise, either because the market responds and invests or demand forecast changes. This is how reliability works. Information about the expected supply demand balance and prices guide investments so demand can be met.

Past events, such as load shedding in South Australia and New South Wales in 2017, the black system in 2016 in South Australia, actual and projected closure of generators, and an increase in the use of directions by AEMO lead people to the question of whether its reliability or security that is of greatest concern to the power system.

System security

The Reliability Panel's most recent market performance review showed that in 2016-2017 the power system dropped outside secure limits for more than 30 minutes on 11 occasions, and that included the South Australian black system event. Now that's significantly higher than what the previous years have been.

Power system security - the technical performance of the power system under shocks - is where a lot of the Commission's focus has been over the last 18 months. Power system security is of vital concern to the overall integrity of the power system and is the most technically challenging issue. It has the potential of massive consequences if you get it wrong.

From a consumer perspective of course the technical different between security and reliability may not matter, but from the regulatory and power system operations perspective it matters a great deal. It's unfortunate that the media, politicians and a lot of people confuse the two terms or use them interchangeably.

This is because, as I previously mentioned, the tools and solutions that are needed to address these are quite different. For example; if we had a reliability problem we would be considering ways to incentivise investment in new generators and demand response capability.

But to address system security issues, we need to look at designing regulatory frameworks that firstly enable AEMO to take the action it needs to keep the power system secure – providing the tools. We need to strengthen the power system to withstand faults and failures and we need to keep technical parameters, such as frequency and voltage, operating within the correct range. And I will now expand on each of these aspects.

Keeping the power system secure

Firstly the tools, we have been providing AEMO with the tools it needs to keep the power system secure.

We've updated generator technical performance standards. In September we made significant changes to technical performance standards for generators seeking to connect to the national electricity grid, as well as the process for negotiating those standards between AEMO, the network businesses and the connecting generators.

Generators play an important role in helping AEMO and the network businesses keep the system secure. This can include having the technical capability to control their voltage and frequency when there are disturbances to the power system. Under the new rules, a connecting generator's technical performance requirements are set taking in to account the local power system needs at their point of connection rather than having a one size fits all approach. This is key to keeping costs down for the connecting generators and consequently the consumers.

We've clarified the scope and level of detail for plant models that registered participants are required to submit to AEMO. That is, the technical mathematical model of the equipment that's connecting. Put simply we've had a pretty good understanding of what synchronous generators look like in those models but we're not so good on the inverter connected equipment and its related control systems and the performance of the plant driving that. These more detailed models will provide AEMO and TNSPs with access to the information they need to support effective power system studies in this changing environment.

In September we made a rule to establish a register of distributed energy resources, and this will include small scale battery storage systems and rooftop solar and other embedded generation. This will give the network businesses and AEMO visibility of where the distributed energy resources are connecting and helping in planning the operation of the power system as it transforms.

Strengthening the power system to withstand faults and failure

We've been strengthening the power system to withstand faults and failures. With respect to emergency frequency control schemes we've outlined new management framework for these control schemes which is the last line of defence in helping the power system remain stable and not black out. We've required AEMO to regularly and transparently assess the emerging risks caused by the transition from synchronous generators to non-synchronous generators technology such as wind and solar.

With respect to minimum levels of system strength or fault levels we've allocated responsibility to AEMO to calculate, and then TNSPs to deliver, certain levels of system strength above an agreed minimum level. Now this is very interesting because when I was responsible operating the northern third of Sydney's electricity system in Dural, in Electricity Commission days, we used to worry about fault levels and system strength being too high because the equipment at Daly St in Surry Hills, I can tell you, was really barely able to interrupt fault currents. So we used to worry about high fault currents. But now in South Australia because of the changing technology, the issue is that the fault levels aren't even high enough to allow protection systems to operate correctly, to help maintain the voltage levels and the like. So we are seeing change at every level.

With respect to inertia, another requirement, we put an obligation on transmission network service providers (TNSPs) – transmission bodies – to procure minimum levels of required inertia so that the frequency control services to meet the greater rate of change can be maintained. And that's why ElectraNet at the moment is out procuring synchronous condensers to actually help both provide more system strength and more inertia on the power system.

Keeping frequency operating within the correct range

In terms of parameters, I will give you the example here of frequency. We are considering the required level of primary frequency control to manage the rate of change of power system frequency. The old synchronous generators have governors on them that used to respond in very short times to actively maintain stability in what we call the primary frequency control area. As they retire or some of them are de-tuned, we're finding the distribution of system frequency in the normal band is perhaps not that desirable. So we've also been updating the frequency operating standards which consider the settings and frequency bands and time requirements that AEMO must maintain for power system frequency.

Under our frequency control frameworks review we've been looking at ways to integrate new technologies to help keep the power system secure and that work is ongoing.

So we've been focussing on the tools necessary for AEMO to deliver a secure power system. We focussed on strengthening the power system itself and we've looked at technical parameters under control.

All of this is working towards achieving a secure power system.

Finkel update – key recommendations delivered by the AEMC and underway

Many of these system security projects relate to recommendations that were made by Dr Finkel in his independent review into the security and reliability of the national electricity market, and that's not surprising as many of these projects were already underway as he was writing his report.

In fact, the AEMC's work program on system security was established in mid-2016, prior to the South Australian black system event. You may remember that the Finkel independent review was established in response to the system black event in September 2016. And as the title suggests, its focus was on security and reliability.

Now looking at the Finkel recommendations, or some of them, I have already covered the first five, so I'm not going to dwell on those. The sixth one we have only just recently made a new rule that requires large electricity generators to provide at least three years' notice prior to closing.

This information is intended to provide time for investors to respond and build replacement capacity and also for affected communities to plan for change. I guess time will tell to see how effective that will be.

Now looking at some of the Finkel recommendations that are still underway – with respect to a mechanism to facilitate demand response in the wholesale market, our reliability frameworks review recommended a range of ways to support more demand response in the system. One of these was the creation of a new mechanism to be introduced for energy users to sell demand response in the wholesale market.

We have started work on several rule changes that we received following that review. The key things to think about when designing a demand response mechanism for the wholesale market are;

- Is it to be scheduled? Is it able to be centrally dispatched, and visible to AEMO and other participants?
- Is it accessible to consumers, so they could participate in demand response without the permission of their retailer? i.e. does it have to be mandatory for retailers to participate?
- Are you able to accurately assess how much demand response there has been? Because it's not easy to measure something that didn't happen.

- Is it designed in a way that could contribute to the reliability of the power system?

With regards to enhancements to the reliability and emergency reserve trade scheme (RERT), AEMO has proposed changes to the RERT. The RERT is a type of strategic reserve mechanism that allows AEMO to contract with generators or demand response providers ahead of time, and out of the market, so it can be on standby in case the market doesn't present with sufficient generation. The RERT procurement framework has to balance the benefits to consumers of having reliable electricity supply against the costs associated with increasing the levels of reliability.

The Commission's main focus is to make sure the trade-offs are effectively balanced so consumers will not end up paying more than necessary.

Another interesting area is with respect to the coordination of generation and transmission investment. Bearing in mind generation investment is by entrepreneurial or commercial investments whereas transmission investments are regulated and planned.

A large amount of generation is clearly connecting to the power system in the coming years and this will require increased investment in transmission if it is to get to market.

Will the current framework deliver enough transmission quickly enough and in the right place? So we are consulting on possible changes to the existing regulatory framework. Our aim is, again, to make sure the regulatory framework protects consumers from unnecessary investment by making sure all transmission investment is appropriately identified; consulted on; and the benefits assessed. Part of this conversation is about clarifying what consumers need from the transmission framework.

With regards to better integrating distributed energy resources into the national electricity market for system security. Along with AEMO and the AER, we are considering what changes are needed to make regulatory frameworks and operating processes so distributed energy resources can be used to support system security. There are trials underway, such as virtual power plant demonstrations, which will improve understanding across the sector of how aggregated resources; coordinated using software and communications technology, can be used to deliver services that have traditionally only been provided by conventional power plants. This could lead to possible changes to access and economic regulation of network services.

With regards to the review of regulatory arrangements for standalone power systems. Changes in technology mean that standalone power systems, that's electricity supply arrangement that is not physically connected to the main

national grid, are becoming an increasingly viable option for providing electricity services to consumers, particularly where the costs of providing of a grid-connected service might be high, particularly in remote areas. In general, standalone power systems are currently not captured under the national electricity frameworks. They are instead subject to jurisdictional legislative frameworks which vary in their comprehensiveness from jurisdiction to jurisdiction.

We are about to publish a draft report that will set out the direction of the Commission's thinking for regulatory arrangements that will allow standalone power systems to be used where it is economically efficient to do so, but also maintaining appropriate consumer protections and service standards.

And the last point there about capital and operating expenditure. The Commission is certainly looking at this; we've looked at a number of alternative options and are continuing to do so, to make sure there are balanced incentives on network investment.

Reliability in the NEM

When I was originally asked to speak at this conference, one of the subjects suggested to me was the status of the national energy guarantee, or the NEG. Well that's changed a lot since I was asked to speak, but I still thought I would touch on this.

Some of the drivers of transformation of the energy system are outside the energy system, such as the international commitments to reduce emissions across the economy. The Commission has provided advice to government over the years about how emissions reduction policies can be designed in a way to deliver reliable electricity at the lowest possible cost.

Some of the key points we made to governments are;

- Any mechanism to drive emission reduction needs to maintain the link between financial incentives and the physical need for investment in the energy system. The mechanism needs to be integrated with energy market mechanisms, both at a policy and implementation level so they can work in unison, driving emissions down while maintaining a secure and reliable power system.
- It needs broad support so investors can make investments on the back of it, knowing it will be around for a while.
- It needs to be technology neutral, while not being emission reduction neutral.

There was a broad agreement amongst stakeholders that the national energy guarantee design would have supported these objectives. Not perfectly, but at least better than what they are at the moment.

However, even without a nationally agreed emission reduction policy, it is clear that renewable energy is continuing to grow. As the power system changes, it's important that it still delivers reliable supply to consumers.

Reliability in the national electricity market, as I mentioned before, is largely driven through market participants responding to financial incentives and information provided about the need for resources. It's important that there are robust market structures in place and accurate information available to underpin investment, retirement and operational decisions. But it is also important that there are appropriate intervention mechanisms available where necessary.

And to this end, the COAG Energy Council has decided to progress development of a retailer reliability obligation. The communique from their last meeting says that the obligation will ensure enough of the right resources will be available to meet demand in the market particularly in regions with limited access to dispatchable generation. If the right investment does not come forward to address forecast supply shortfalls, this would trigger an obligation on electricity retailers to demonstrate they can meet their share of peak demand.

So the energy security board is going to return to the COAG Energy Council this December with a draft bill on the retailer reliability obligation.

Energy market reform in 2019

So looking forward. In 2019 there are many ways to address the challenges facing our energy market and power system. Our work aims to put customers first so they can take control of their energy choices and bills.

Sometimes energy reform will involve fundamental changes to the energy market – for example, we made a decision last year to move to five minute settlement – probably the biggest change in the market since it commenced 20 years ago – or almost 20 years ago (it's got two weeks to go before it's 20 years old).

But more often than not, our work focusses on the nuts and bolts. And I've talked to you about quite a few of the nuts and bolts. This work is no less important, but it is incremental. Making the appropriate changes at the appropriate time to deliver what customers want and need from their energy sectors.

AEMC key areas of focus

The things we are focussed on for the coming year are control, choice and protection for consumers. We understand the community as a whole is very

committed to exploring new technologies and renewable options. Our intention is not to hold this back, but to enable consumers to choose what they want without cost burdens that could be avoided with better planning and more efficient rules and practices.

We also work to protect consumers, especially the most vulnerable. We are implementing a package of changes to help deliver more affordable energy by giving consumers more control over their energy bills. This includes new obligations on retailers to implement effective hardship policies to help customers who are having difficulty paying their bills, to provide notice to customers before prices change or benefits end and to accept customers meter-self reads if the customer thinks their bill is wrong.

This package builds on the AEMC's power of choice review which has laid the foundations for an energy system where more engaged and better informed energy shoppers have greater access to new products and services like solar, storage, electric vehicles and smart consumption management.

Also a continuing focus on power system security – I've spoken a lot about power system security today, and we will continue to focus on this.

Gas markets are also transforming. With the development of Australia's energy export market, what were once isolated point-to-point pipelines have now evolved into an interconnected of area with two-way flows.

The AEMC has been helping re-design Australia's gas markets. These reforms which are still being implemented will make it easier and cheaper to move gas around Australia to where it's needed and valued most by consumers. This is helping to keep gas and electricity prices as low as possible.

Everyone has a role to play

The sector is changing rapidly and our areas of focus will change with it. But I will end today by highlighting two useful elements of the energy governance system that will guide reform now and in the future.

Firstly, anyone; any company, government, any advocacy group or individual person, anyone in this room or anyone at the end of the webinar can propose a change to the rules. The only party who can't is the AEMC itself.

This means that if you think there is something not working, if there is a barrier to a technology or a problem with how the physical or financial market operates, you don't need to go lobbying governments – you just need to propose a change, showing how it will enhance the long term interests of consumers.

We then have a look at whether that change would be in the long term interests of consumers, which is in line with our statutory objectives. If it is, we will change the rules, and if it isn't we won't.

Secondly, all of this is done in consultation with stakeholders, people on the ground, such as yourselves, who would be affected by the proposed change. Stakeholders help us identify the problem and to come up with a solution. We are committed to collecting evidence, testing ideas, using your input to come up with robust and lasting solutions.

Regardless of the change proposed, we depend on input from stakeholders to get them right, and we are fortunate to have many willing stakeholders that do engage. Last year we held nearly 1000 formal stakeholder meetings.

So I'd like to thank those of you in this room and on the webinar that do offer your time and expertise to help solve issues in the market and our regulatory frameworks; and I'd encourage the rest of you to get involved.

Thank you

ENDS