AEMC

SUMMER BLACKOUTS THE NEW NORMAL?
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Introduction

200,000 Victorian customers lost power on 25 January 2019, begging the question: is this the new normal? To answer this question, Grattan Institute's Guy Dundas was joined at this Policy Pitch event by Paul Austin from the Australian Energy Market Operator, the body that manages the electricity market, and Suzanne Falvi from the Australian Energy Market Commission, the body that sets the energy market rules.

Moderator Paul Austin

Can I welcome everyone to this policy pitch event at this fantastic forum in the State Library of Victoria. I would like to join Suzi in acknowledging the traditional owners of the land on which we meet and I too pay my respects to their elders past and present. I'm one of the two Paul Austins on the panel tonight. I'm the editor at the Grattan Institute and I'm delighted to be joined on stage by three energy experts. Industry analyst Guy Dundas, market operator Paul Austin and the rule maker Suzanne Falvi.

Our first speaker tonight is the industry analyst Guy. Dundas. He's a recent and very welcome addition to the Grattan Institute where he's our energy fellow. I've quickly come to learn that there's nothing worth knowing about in the energy sector that Guy doesn't know. Guy has previously worked for, among others, the productivity commission, the climate change authority, a range of consultancy firms, a range of government departments and he is, most relevant to tonight, the co-author with some of my colleagues in the audience tonight of a new Grattan report on electricity reliability which was released just last Sunday. You may have heard Guy interviewed about it on ABC radio, you might have read his piece about it in the Herald Sun today. Ladies and gentlemen, please welcome Guy Dundas.

Mr Dundas

Thanks Paul and good evening ladies and gentlemen. As Suzi and Paul have both foreshadowed I don't think there's any mystery as to why we're having this event here and on the topic we are. Just over two weeks ago 200,000 Victorians lost power on 25 January and we shouldn't forget the night before on 24 January the Portland Aluminium Smelter was also asked to reduce its load on the grid to keep the system in balance. Now, such a large event in the midst of a heatwave in summer clearly provoked a lot of media and political debate, begging the question of tonight's topic "are summer blackouts the new normal?" And we'll do our best to both give you a sense of what happened on that day, and more importantly a sense of whether these events will become more common in the future and what the policy implications are for our governments and our regulators.

So just to be very clear about the nature of these events, obviously supply and demand in the electricity system need to be in balance and if on a very hot day, or as we saw on this occasion where some coal units were unavailable, there's just not enough supply to meet demand, the only way the system can be kept in balance is by involuntarily turning some customers off. So on that Friday it was done on a rotational basis. So those 200,000 affected customers were off between the period of 12 and 3 pm on a rotational basis. As yet we don't have full public information on who was off for how long, but we do know that roughly 200,000 customers were affected on a rotational basis. So clearly a big event and something we want to understand better. Now, I'd like to put it in its historical context. Events like this, so-called generation shortfalls or load shedding events are very rare. Listed on screen at the moment are the only five days in the last 14 years since the start of 2005 where this has occurred in eastern Australia. So they certainly get a lot of attention when they happen, but we must remember, I think it's important for tonight's discussion to remember that they are very rare. But of course we don't want them to become more common in the future and there are some implications and things that governments need to do to help that remain the case. Now the last such event in Victoria was almost exactly a decade ago, it was in that very hot summer, the early part of 2009 that actually led into Black Saturday.

Customers across Victoria and South Australia were affected, over 200,000 on two consecutive days, 29 and 30 January for about 40 minutes on average again on a rotational basis. More recently we saw a smaller event, 85,000 customers in South Australia for about half an hour affected in February 2017. That also was quite controversial and led to the South Australian government procuring backup generation which I'll talk about in

a moment, but so clearly these effects, they last in the memory and they have political and policy ramifications. Now, I think it's worth highlighting also that one of the key factors leading to the events of January this year was, going back just a couple of years, the closure of the Hazelwood power station. So the system isn't in a tight point at the moment, it had a reduction in supply and that happened with quite short notice. So Hazelwood announced its closure in November 2016 and closed in March 2017 and really we're still seeing the flow-on effects of that.

The market has been tight ever since and it takes time for new investment to bring on new supply and give us a bigger bugger against these sorts of events. So in a way it's not surprising that we had an event like that, but it was that combination of high temperatures and plant outages that saw it happen. Now just one last contextual point, these events are rare, they also constitute a very small part of all the outages that occur across the supply chain. Suzanne has a slide on that later on, so I won't spoil her thunder, but very much less than 1per cent of all outages occur due to generation shortfalls. So the report that Paul mentioned that I recently put out with my colleagues Tony Wood and Lucy Percival looked at the whole supply chain, but tonight we're going to distil down, we're going to focus on these hot summer events, these generation shortfalls and try to tell you whether things have changed for the worse or whether they're going to stay bad into the future. Now our view is that generation shortfalls are not the new normal provided governments keep calm and carry on, so this report made some policy suggestions for what they should do to keep this the case and I'll touch on them in a moment.

I think it's important to recognise when we do discuss whether generation shortfalls will become the new normal that we should not be aiming to make them never happen. The risk of generation shortfalls being zero would imply a very high cost. We must try to balance the costs and benefits. We all like more reliability but we don't want our electricity bills or our taxes to go up necessarily to pay for 100 per cent liability, and I think a really useful case study, and there is a bit of detail on the screen which I'll talk to in a minute, is that example I mentioned before of the South Australian government's decision to invest in backup diesel generation which followed on from their event in February 2017. Now the two-year lease of about 270 megawatts of generation cost the South Australian government $115 million and it got used for four hours. Now if you cut how that usage was broken down, and these numbers are approximate, but I think they're useful for the discussion today, really what we saw was if we hadn't had those generators we would have had about 30 per cent of South Australian households experience about one hour without power on a rotating basis in that four-hour period.

So put differently, is a cost of over $100 per household in South Australia worth a one in three chance of avoiding a one hour outage every two to five years? Look, I think we can all make our individual judgements about that, but I'm not sure that the South Australian government would do again what they did do if they knew what they know now, and I'm not sure that the Victorian government should be rushing to follow their example. So I really do want to emphasise that point that we need to balance the costs and benefits of reliability. Now that $115 million was just the tip of the iceberg, they've since purchased those generators and will incur further costs in operating and relocating those generators over their life. The total bill is going to be in the order of 500 to 600 million dollars. Of course we don't know what the benefits of that will be, how often it will be called into use, but I think the experience so far raises pretty significant questions about that particular investment and that particular government reaction to a generation shortfall.

So let's look forward, enough of the past, let's look forward. Now the chart here shows the Australian Energy Market Operator's (AEMO) electricity statement of opportunities outlook on the electricity market, so Paul's organisation. Now this is a document that looks at the state of the market and sees whether more generation is needed to maintain reliability in the market. So the horizontal dash line there is the reliability standard that is set for the national electricity market. That's set at .002 per cent of energy being unserved in any region of the national electricity market in any year. If we look forward and see that standard being breached then we would say that there's a problem, if it's under there then we start to say – then we would say the reliability standard is being met. Obviously as we can see where Victoria is today it's very, very close to that standard so there is in fact an element of grey in that. But the persistent position above that dash line that you see in the middle of next decade at face value looks concerning. I'm here to tell you that it's not that concerning.

So this outlook has a very specific purpose. By the dint of the rules it can only consider generation investments that are currently in operation or that are committed to be built, which is a very strict set of criteria about effectively there's a contract, a financial contract or a procurement contract to build that generator. So of course looking out to 2024, 2025 we don't know what generators will be built yet 100 per cent for sure. So this is if you like a very conservative look at what is going on, what will be in fact happening in the market at that time by design. It's meant to signal that new investment is needed and it shouldn't be seen as our base case of where the market will be at in the middle of next decade. The market has delivered investment in the past and we think with the right

certainty from governments it will also be able to deliver that investment in the future.

Just to highlight one inflection point, I mentioned the Hazelwood closure before. That kick up in the outlook for New South Wales in 2022 is related to the next major coal closure, that of the Liddell power station which is flagged for March 2022. So that drives a lot of the results that you can see there. Now if we do assume as AEMO did for its integrated system plan which has a different purpose and is not bound by the same rules as the statement of opportunities, if we do assume ongoing investment similar to the patterns that we're seeing today, then we see that the outlook is quite different. So clearly investment is key and these are not unprecedented or speculative levels of investment that are required to maintain reliability. So it clearly is achievable but we do need to give investors a stable platform in which they can continue to deliver investments through the next decade, and of course Liddell won't be the last coal fired power station that closes. After that we will see Vales Point and potentially Yallourn here in Victoria and many others rolling through the next decades. So we need that stable investment environment to ensure that when those coal plants do retire we can replace them with new assets and new investment.

So a few arguments have been made as to why the investment environment is particularly challenging and I'll give you a brief take on each of those and where we got to in our report and what are the implications for government. So certainly gas fire power stations are flexible and can be turned on to meet demand peaks. That's what we saw the last time the market was tight. But the gas market has changed a lot since 10 years ago. We've seen gas exports for Queensland, prices have gone up a lot and it is very difficult to get contracts to underpin new gas power stations. So that is potentially a risk to future investment and to the reliability of the market. We certainly acknowledge that. We didn't put forward a specific policy response to that. The gas market is a very complex beast, potentially a report in its own right, Tony, but we think that integrated players with a gas portfolio will be able to manage those risks, so it's not an intrinsic or show stopping risk to reliability in our view.

Now what you hear a bit about is the volatility created by wind and solar, and perhaps the simple version of this is what are we going to do when the wind doesn't blow and the sun doesn't shine? The answer to that is build flexible dispatchable generation. That may be gas and it may be hydro, and also demand response. So use is voluntarily turning down demand at very peak times are all potentially important responses to that volatility, but those investors do require certainty. So in and of itself we

don't think increasing levels of wind and solar are a problem, provided we can address the uncertainty in the investment environment. Which brings me to my next point, climate policy uncertainty. Now if like me you've been following this for the last 10 years, you're probably scarred and or sick of this issue but unfortunately it doesn't go away. We've had chronic uncertainty for 10 years and it must be resolved.

Investors are crying out for that certainty, and in our view while the ideal policy might be an explicit carbon price, we think that political realities take you to a menu of second best solutions, all of which are perfectly satisfactory, and the most likely given the current environment is almost certainly the national energy guarantee that was considered in detail last year but not ultimately implemented because the Commonwealth government withdrew its support for that. Now some governments certainly have focused on the perception that there is a reliability problem. We think that the problem really stems from this emissions issue and is not intrinsically a reliability problem and so heavy handed government interventions like underwriting new investment or pushing large projects like Snowy 2.0 which is a project from a government owned company actually are ineffective and poorly targeted measures to address reliability and in fact they create uncertainty for those commercial investors who are looking to time the opportunities in the market for their own investments.

So let's look at the case of Snowy 2.0, it's slated to start operations in late 2024, but as I mentioned before Liddell closes in March 2022. So we've got this behemoth project coming down the line but it's after the closure of Liddell, so that's going to make it very hard for someone to come in before and fill that market gap because they'll see this large project coming after them that would take their market away. So we see that these heavy handed implementation projects and interventions can have unintended consequences and we think that government should steer clear. And finally, we do acknowledge that there is a need for backup reserves, so you will hear a bit more from Paul and Suzanne about a mechanism called the reliability and emergency reserve trader or RERT, which was used on 24 and 25 January, but was not sufficient to eliminate all of the load shedding. Now we do think this mechanism is important for unexpected events, a sudden technical failure at an old coal fire power station for example, but it does need to be finessed to balance costs and benefits and that's something that Paul and Suzanne have been working on closely and I think will be well placed to talk about. So to sum up, we think that the market is going through a difficult period but it can get through it with investment, as it has delivered in the past, and really the key factor is for governments to deliver that certainty for investors. Thanks very much.

Moderator:

Thanks Guy, that's a terrific breakdown of what is often a complex and confusing debate. Our second speaker is Paul Austin from the Australian Energy Market Operator, or AEMO, the body that manages the electricity market, and yes Paul happens to have the same name as me. So I should make it clear that we're not related, at least not to the best of our knowledge. To give Paul his correct title he's group manager, market monitoring and insights at AEMO, basically he runs our electricity market. Paul has previously worked in the wholesale and retail divisions of two of the big three energy companies AGL and Energy Australia, and last year he was seconded from the market operator to the newly formed Energy Security Board to work on the design of the National Energy Guarantee. He is at the very heart of energy policy in Australia and I am looking forward to hearing from him tonight. Ladies and gentlemen, please welcome Paul Austin.

Mr Austin:

Thank you, Paul Austin. I've never had to say that before. So I think Guy did a good job of presenting the case for Grattan there in terms of outlining the changing nature of the system and the required sort of responses going forwards. Now one of the slides sort of talked about the – there's only been five days of load shedding in the last 14, 15 years since 2005 and I think that illustrates when you look at those days the changing nature of the system. The (indistinct) for most of its life has been quite over supplied and reliability hasn't really been a major issue and that's borne out in those statistics, but when you look back at the last couple of years things have changed quite significantly. So in 2017 we had one official day of what's called unserved energy, USE, which is load shedding. We also had a day which is not reported as unserved energy which was on 10 February in 2017 in New South Wales where there was also load shedding but because that day was due to a – what's called a contingency event where there is multiple trips of a particular generator, that gets scoped out of that reporting but that was a day of load shedding.

So we had two days of loading shedding in 2017 and 2018 we had a couple of days, January 18 and January 19, where we were very close to load shedding in Victoria and if we'd had a sort of one in 10 P10 style weather event we would have been looking at load shedding as well. And then we've had two days in this summer and hopefully no more. So if you look back at 17, 18 and 19 we're looking at quite a changed system and quite a different risk profile, and this is the perspective which I'd like to bring to it. So if you look at the actual Bureau of Meteorology's

anomalies, temperature anomalies, for January 2019 this shows the deviation from the long term average and what you can see here is that January was actually the hottest January on record across Australia and when you look closely at the colours you can see WA was not too hot and much of Queensland was not too hot and there was a really concentrated heat spell over South Australia, northern Victoria and much of New South Wales and southern Queensland. Obviously we saw record temperatures in parts of South Australia and New South Wales and extreme system conditions, harsh system conditions. And this is the risks that we're now looking at in terms of the system, this was an extreme event but in general we've seen a continuation of the warming trends that is very apparent if you look at any climate data and so we can expect higher temperatures to be a factor in the future and a risk that we need to be managing.

It's not just temperatures that are a worry. High temperatures can be coincident with bushfires, bushfires affect transmission lines. Even as recently as the week before last or so when Tasmania's bushfires were at their highest we saw Basslink having to be pulled back because of the risk to the transmission lines there. So this is something that we're managing in real time. We've seen flooding in Townsville recently and flooding is something that can happen at any time of year obviously. When there is flooding it can affect if it's close to coal fire power stations coal supply through wet coal. So much that we have to look at in terms of managing climate risk. If we look at what happened on 24 June in South Australia, so this was the Thursday and it was the almost record breaking temperatures. So we had 47.7 degrees at Kent Town in Adelaide on this day and very high demand, not record breaking demand, and during this day we can see here the challenge of managing renewables and how we have to plan for renewables in the system. So the green shaded areas and the yellow shaded area are the wind and grid scale solar, which is basically Bungala Solar Farm in South Australia, and you can see that's where the peak demand is occurring, which is about 7 o'clock Eastern Standard Time, so we're getting a limited contribution from the solar and as is quite common in these events we're seeing a wind de-rating during this time.

So there's correlation between the wind resources that we have in South Australia and Victoria, when we have certain heatwave-type conditions we tend to see all of the wind sort of being reduced at the same time and that obviously poses challenges for us in managing the system. The effect of rooftop PV is to – rooftop PV is netted off demand, so it's effectively behind the meter. What that does is the demand that we have to serve in the grid is effectively the net of that and that gets pushed forward into the

evening as the amount of rooftop PV has increased. So we used to see system peaks sort of in the mid-afternoon in South Australia, that's sort of now moved to the evening and we get a much steeper climb in the peak as we go into the evening because of this effect, and some people might have heard the term "duck curve" which is used to describe this hollowing out of demand. A new technology and distributed resources also brings new challenges. There's the unknown unknowns in terms of understanding how all these new pieces of kit will interact and operate in times of extreme conditions and this is something we're continually learning and being exposed to.

For traditional generation, thermal generation is also a concern for us. When we look at the ESOO (electricity statement of opportunities) modelling which Guy described earlier, one of the inputs to that is the forced outage rates, so this is the likelihood of a generator experiencing an outage and we've seen over the last few years an increase in the forced outage rate from thermal plants and this is something which is obviously related to the ageing of these plants and we factor this into our ESOO forecasts in forecasting the outlook for supply and demand. In the recent heatwave on the right chart there is the performance of the brown coal generators over the Thursday and the Friday and you can see that there's a steady decline through this period as we're dealing with a number of outages. So we had two Yallourn units were out by the Friday and we had a Loy Yang A unit which was out on the Thursday and then derating of a second Loy Yang A unit which then was taken over Thursday on the Friday being after the worst of the heat had passed. Even Loy Yang B experienced some derating during the middle of the afternoon on the Friday.

So what all this leads us to sort of conclude is really we're looking at load shedding or unserved energy as a tail risk and it's a low probability but potentially high consequence event and you can see in the chart here the shape of the tail and the area under the tail is a very small proportion of time, it's only a few hours a year of risk that we're facing here, but consequences can obviously be very high if people are without power during times of extreme heat unlike network outages which tend to be more distributed through the year to do with high winds and other sort of random events, reliability-type events are more associated with high temperatures and coincident outages.

So tail risks are common in lots of areas and the usual way of managing tail risk is to procure insurance and really the reliability and emergency reserve trader (RERT) is a way of meeting that risk through insurance. So we describe the tail risk as something which can be delivered through

procuring insurance and RERT provides that insurance. Now obviously the cost of that is a key consideration and the cost of that should decide how much insurance you're willing to procure.

So what we're advocating for is a number of steps.

The integrated system plan that Guy referred to earlier is a comprehensive plan for the national electricity market in terms of the outlook for transmission and supply and demand and there's a number of recommendations in the integrated system plan around augmenting certain transmission lines and planning for a future which allows more integration of renewables and identification of renewable zones into the future.

The second recommendation is around the level of the reliability standard and how that is set. The reliability standard is at this point 002 per cent of USE, unserved energy, and there's currently a review being undertaken by the Australian Energy Regulator (AER), to look at updating the numbers from the last time it was reviewed which was in 2014.

The results of that should be known by the end of the year, but we're looking for that study to reveal what the tolerance is in the community for load shedding in today's society. Obviously a lot's changed in the last five years.

We suspect people are more dependent on their devices and their Wi-Fi and so on and it would be a very useful bit of information to come out of that study in terms of informing the society's trade-off between the cost of load shedding and the tolerance for load shedding and the cost for ameliorating that which should form the basis of the liability standard.

Then the last thing we're advocating for is strategic reserves and so one of the challenges with the RERT mechanism is it can only be procured if the reliability standard is forecast to be met. So it's sort of an on again, off again type of trigger and really the question there is have you considered all of the full range of risks when you're making your assessment as to the outlook for the reliability. So we believe that a strategic reserve will provide greater assurance for providers of these reserves to be able to make the necessary investments so that we then have enough competition between reserve providers to be able to lower costs and ensure that we have a competitive outcome. So that's what we're recommending in terms of addressing the overall reliability issue.

Moderator:

Thanks Paul for that insight into the sort of risks that you have to manage and the thinking that's applied to that delicate task. I saw a few members of the audience taking notes during your presentation, Paul, so I think there might be a few questions coming your way very soon. But before that to our third speaker, Suzanne Falvi, from the Australian Energy Market Commission, the body that sets the energy market rules. Suzanne's formal title is executive general manager, security and reliability at the AEMC. She brings a wealth of experience to her role. Suzanne is a former senior energy policy advisor to the ACT government in-house counsel, a solar technology RND company, and a special counsel for Minter Ellison specialising in, among other things, energy law and litigation. She now leads the team responsible for reviews and rule changes relating to the security and reliability of our electricity supply. So I'm guessing she's had a busy summer. Ladies and gentlemen, please welcome Suzanne Falvi.

Ms Falvi:

Thank you. So given the topic of today's event, I thought I'd talk to you about what the AMC is doing in terms of maintaining electricity reliability in the national electricity market.

We have a very broad ranging security and reliability work program, and one of our projects is particularly topical to tonight's event. It's our draft determination to enhance the emergency power reserves framework - and to do with the reliability and emergency reserve trader, the RERT.

Last week we published our proposal for how it should be enhanced. So I think Guy alluded to this pie chart.

See annotated charts here.

What causes black outs has been part of our work program for over two years. We did the analysis of what causes outages, not only to provide context for our work and to inform the debate about what the solutions might be, but it's really important to identify the causes, problems or issues that need to be considered. That's important because you want to develop targeted solutions to actual problems so that the costs that we're incurring in meeting these problems are as limited as possible.

So you can see from this pie chart, and it's something that the Grattan report explored as well, that the majority of our outages are caused by faults on poles and wires, things that you see on your street.

Over the last decade everyone's experienced firsthand the costs of trying to address this – you have all heard of the concept of gold plating our networks and the fact that at the moment around 50 per cent of your retail bill is network costs. 3.2per cent of the outages that we suffer are a result of security events, and when we talk about security we're talking about whether there's been a technical fault on the system, so the system black event in South Australia is regarded as a security event, also when a lot of generators trip, for example. But it's the 0.2 per cent that we attribute to reliability, which I'm going to talk about in terms of emergency reserves to deal with the risk of the outages you've experienced recently.

So you can see that when we're talking about reliability, and something Guy outlined as well, we're talking about a very small percentage of the outages that have occurred in the national electricity market. So historically we can see we've had a pretty good track record of reliability.

This graph, "percentage of consumer demand met by available generation capacity over time" shows the few times where we have had unserved energy in excess of the reliability standard. Guy has already taken you through that. There have only been a few days in the last decade.

But as we've heard from Paul the system is changing. We've always had, as long as the national electricity market has been on foot, there's always been a regulatory mechanism that allows the operator to contract for emergency reserves. Prior to 2017 AEMO had only entered into RERT contracts three times, but had never actually used them. This changed in 2017 when an AEMO entered into a number of emergency reserve contracts. Since that time RERT has been used in November 2017, January 2018 and most recently in January 2019.

The increasing use of this mechanism reflects a system with changing needs. There is a growing proportion of variable renewable generation, an ageing fleet of thermal generation, tightening supply demand balance, peak year demand and as we've seen higher temperatures. So if we're going to use this emergency reserve trader more often we need to make sure it's fit for purpose.

It's helpful to understand how emergency reserves fit into the broader reliability framework that we have on foot, the reliability framework that is intended to deliver capacity so we have energy available when we need it A reliable power system is one in which investment and operation decisions of market participants are such that they meet the reliability standard which we've just heard is either 0.02 per cent of unserved energy or another way of putting it is that the demand for energy is met 99.998 per cent of times.

So in a reliable power system the power supply usually includes a buffer which we will refer to as market reserves, and that's made available to the market as part of the usual operation of the power system to meet the reliability standard. It's also driven by some of the way that generators get renumerated. Generators like to forward contract their output in order to lock in revenue certainty. By contracting that way they have particular incentives to make sure that when prices are high in the market they are there. So when the system actually signals through the market that there's a need for energy, generators have every incentive to be available. When that supply demand balance tightens and the spot market and the contract prices rise, this normally requires generators to be on for longer and it generally signals the need for longer-term investment in generation assets. This actually allows demand and supply to be kept in balance, even in the face of shocks to the system.

Now AEMO operates the system to meet the reliability standard . The operator makes forecasts from 10 years out as we've been hearing, right down to two years and closer based on lots of modelling. Through this process it sends lots of information to the market including when there is likely to be a shortfall in market reserves. The framework is set up so that information goes out to the market and the market is designed to respond. When the market sees a shortfall that normally means that prices are going to go up, allowing generators to make certain calls, like if they have another unit that is often a higher cost to run unit then perhaps they should make it available. If, and frameworks are set up so there is sufficient time for this, if in response to these market notices there is no response, then the market operator engages emergency services. They are additional reserves that are utilising generation and often demand response resources that are not otherwise available in the market and they're purchased through this RERT mechanism.

So some of the thinking in terms of the mechanism has also had to do with the reliability standard that you've heard about. We've actually as part of our work program we've had to turn our minds to whether the reliability standard is appropriate and the Commission's view is that the reliability standard is appropriate. However, we acknowledge that the system is changing and it is harder and somewhat more volatile to operate. This does not in and of itself mean that the reliability standard is no longer appropriate, but it does mean that how we operate the system may need to change.

In our draft proposal on the enhanced RERT that we've put out means there would be flexibility in discretion for the market operator in how it incorporates the reliability standard in its day to day operations. So that

in the way it models and forecasts the risks to the power system it can adapt to change.

But we can't look to the emergency reserve mechanism, even an enhanced one, to fix all the changing dynamics of the market. Emergency reserves are exactly that, they're there for emergencies because they are very, very expensive.

It's also very important that we have a well-functioning market, with clear price signals and information backed up with policy certainty from governments and supported by other tools like the retailer reliability obligation that the Energy Security Board is currently working on.

Given that we think there is a need to enhance the emergency reserve framework to make sure AEMO has all the flexibility it needs to meet the operational challenges, last Thursday we published our draft determination and our draft rule outlining our proposal for how it is that this mechanism should be enhanced. Importantly some of the things we're looking to do is to make sure in terms of how the cost of those emergency reserves are recovered, that they are recovered from those who actually caused the need to use those emergency reserves in the time that they were dispatched. We also want to increase transparency around how the RERT is used. We're looking to make sure that there's enough information provided to the market on how and when it's used and how much it costs - that's because these costs are not insignificant and when market customers need to pay for them they need to actually be able to budget for them.

We have also clarified the trigger.

The RERT can be triggered if AEMO forecasts a breach of the reliability standard. So we're making very clear that it is a safety net and if the reliability standard can't be met then emergency reserves can be procured but in the meantime we need to be looking to the possibility of persisting capacity issues in the market to answer that. We've also increased the lead time that AEMO has got in order to procure these reserves from nine to 12 months. This proposal should mean that there's a greater pool of providers from which the market operator can source some of these reserves, including demand response providers. Hopefully it will lead to lower costs of these emergency reserves. The reform package also includes the price guide. When AEMO tenders and puts emergency reserve providers on their panel, they do so through a competitive process. We're suggesting that there be a guide so the price charged by emergency reserve providers should typically be less than the cost of load shedding. So again, trying to make sure that there is enough flexibility in

the reserves framework but within certain cost parameters. And of course we have strengthened the out of market provisions – because emergency reserves are additional to market reserves - they are not otherwise in the market. So, we are making very clear what it means to be in the market or out of the market by only letting providers that have not been in the market for 12 months enter into contracts to provide emergency reserves.

It avoids developing an out of market trading system for these services. You don't want people leaving the market because they can get more money outside the market. We want as much reserves as possible in the market. I have given you a very quick overview of what that draft proposal is about. As I mentioned submissions close on 21 March, so if you're interested I encourage you to have a look and get involved. We love getting as many submissions as possible. Thank you.

Moderator:

Thanks very much, Suzanne. Well, ladies and gentlemen, as you can see we have here three of the sharpest minds in Australian energy policy and they're now available to take your questions. But the panellists won't be surprised to know that I've got a few questions of my own which I hope won't take too much of your time. I want to ask Guy first please.

Mr Dundas:

I thought you might kick to me first, Paul.

Moderator:

Would I be right in saying, Guy, that a sort of neat summary of really all the presentations tonight is that Australia's energy system is inherently less reliable because we're making this grand transition from old coal to new renewables, and if that is the case does that suggest, as some argue, that we should slow down the transition?

Mr Dundas:

I would say, Paul, that it's the transition itself like any period of change creates uncertainty and clearly the market needs to deal with that. But I don't think it's inherent to the transition from one type of technology to another necessarily. I still think that the key factor is that sudden change in the balance in the market that occurred when Hazelwood closed and that was due obviously to the age of the plant.

But it was the short notice of that closure, so clearly you can't build very much at all in five months which was about the notice of closure. So that would shock any market, even one that wasn't in transition unless it had a

lot of buffer sitting there in the first place. But when you layer I guess the inherent technical complexity of having new types of technology and the sorts of operational challenges that Paul was talking about, yes it does make that task harder but certainly in our view those challenges are not insurmountable, provided the politics of climate change can be resolved and to create that certainty for investors.

Moderator:

So let me ask the market operator and the rule maker, given they're here I'll take the opportunity. I want to reflect on the two big shocks to the system of our recent memory which Guy mentioned, the South Australian blackout of 2016 state wide and the Hazelwood rather rapid closure in 2017. What lessons had to be learnt from each of those two shocks and have the lessons been learnt. First to you, Paul.

Mr Austin:

With the South Australian blackout we obviously have had very extensive reports on that and very extensive review by the AER of AEMOs actions during that event and it's been a case study in terms of learning a lot about how the system works in these types of events and we have put in place many new initiatives since then to strengthen the system, and you only have to look at the frequency that we're having to direct in South Australia for system strength as an example of AEMO being on the front foot and managing these events now. So we're certainly taking a very proactive response to dealing with these. Hazelwood, I mean at the time we were consulted on before I joined and advised that Hazelwood would be able to close and the effect of Hazelwood is to remove base load and if we're looking at the requirements of the system we're looking at a few hours a year of requirement for capacity and so there's not necessarily a good match there between base load and provision of capacity. So I think from AEMOs point of view the concern is we need to make sure we have adequate reserves to be able to deal with the increasing risk in the system and those reserves should obviously be the lowest costs that we can procure, and we need to make sure that the market signals are there for the market to respond, we also need the safety net to make sure that we can handle unexpected and unforeseen events.

Moderator:

And Suzanne, from your perspective what lessons had to be learnt and maybe what lessons are still be learnt?

Ms Falvi:

Still to be learnt. So as Paul mentioned the regulator finished its reporting into the SA total black incident at the end of last year. and this has triggered work for the Commission that it now needs to do - have a look into the investigation and see as a result of that what may no longer be fit for purpose or may need to be updated in order to address some of these increasing security issues that we're seeing. As Paul mentioned, AEMO is having to direct on a lot of our synchronous generators in South Australia in order to meet security needs.

This is a very new and evolving problem and in the last two years we have alreadydeveloped some frameworks in order to make sure you have minimum levels of some of the security services in there.

But it is definitely something with the market operator we're keenly focussed on in terms of what it is that now needs to change in order to keep up with the transition because in relation to the question that you asked Guy, can we slow this down, I'm not quite sure that we can. So it is about keeping up in doing things that are necessary and targeted. And in relation to Hazelwood, as a result of that we actually – the Commission received a rule request which led to us setting up a requirement for three year notice of closure, so generators now will need to give notice three years out that they're likely to close. That information goes out to the market, so we're hopeful that we won't be caught unawares again.

Mr Dundas:

Paul, can I just in on that.

Moderator:

Guy.

Mr Dundas:

Just in case people are not clear in the audience, so Suzanne made that distinction between security and reliability events and that distinction is not an arbitrary one. So in a sense the summer blackout, the heat wave lack of generation capacity issue is very much confined to those very hot days in summer in Australian experience and is if you like you know the type of event that happened very recently. Those security events in that different category, of which the South Australian blackout was one, can really happen at any time and they happen in response very commonly to network breakages in the high voltage network or lightning strikes and occasionally trips of generators. So they're very different things.

Ms Falvi:

Bushfires, tornadoes.

Mr Dundas:

Bushfires, absolutely, you name it and they have very different solutions. So it's important that we keep that distinction in our minds. The South Australian blackout happened on a day that had a maximum temperature of 20 degree. The maximum temperature obviously on 25 January was 40 plus, 46 in Australia on 24 January. So they're very different problems and they have very different solutions and our report looks at all of those.

Moderator:

Indeed, thanks Guy. So I'm going to open it up to questions from you our audience. If you'd like to ask a question, drill deeper into the expertise of our panellists or indeed take on something that they've said now's your chance. Please raise your hand and if you get the call please wait for a microphone to get to you and could I ask that everyone please be as brief as possible. We're looking to get through as many questions as possible and we're looking for questions rather than statements and I'll begin up the back with the gentleman towards the right.

Mr Ode:

Yes, thanks for great presentations. I work with the Australia Institute, my name's Mark Ode and we monitor the output of solar PV as against total demand for the various states and there was a couple of references to solar pushing forward the peaks, the heatwave peaks into the early evening but when you look at it actually tends to reduce them by around 500 megawatts for New South Wales and Queensland pretty consistently. So it tends to reduce that peak. So it's lower than it otherwise would have been and also you would have reached that level that you've had the blackouts and load shedding several hours earlier without solar. So there's a bit of a – what we would consider a bit of a misconception that solar is adding to the problems of reliability when in fact we'd see it as actually bolstering reliability when it's most needed on those hot days. I was just wondering if you could comment on that.

Moderator:

Paul, could I ask you to address that as sort of a plea for understanding of solar.

Mr Austin:

That's a very good point and we did address the impact of rooftop PV in the paper that we put in to support our enhanced RERT rule change proposal and the effect, as you say, has been to reduce maximum demand, so this is why these two days which we saw recently were not maximum demands. The highest demands that we've had in Victoria and South Australia were a number of years ago and solar PV has played a positive role in reducing maximum demands. The impact is to move it into the evening and as it moves later and later in the day, then the marginal benefit of solar starts to fall away and at some point you get to a point where it's not really going to give you anything more. So it's given us a lot of benefit so far. The other factor just to consider is if you are getting that benefit of solar reducing demands and then suddenly the clouds come over, then you can swing quite quickly back to high demand.

Mr Dundas:

Paul, I might just add quickly to that. I think your facts are post on. I think just in terms of how you interpret it I think it's important to remember that, particularly over the time frame over a number of years, people in the market respond to circumstances. So it's probably fair to say that generation investment would be different if there wasn't rooftop PV, so it's not a – you can't hold everything else constant particularly over a longer time frame. So I think it's undeniably true that rooftop PV has pushed those peaks later but I think it's also fair to say that the market might look different if we don't have that. So you've just got to be a bit careful in terms of how you interpret those events.

Moderator:

Okay, I'm going to make this difficult by nominating the gentleman three rows back right in the middle. If we could get a microphone to this guy.

Speaker:

My question is for Guy. I'm interested for a bit of clarification, are you saying that the government should cancel the Snowy Hydro 2.0 project? Is it a bad move?

Moderator:

Good question. Guy.

Mr Dundas:

There's a few issues with the Snowy 2.0 project. One is a lack of transparency, so we don't know whether it makes sense as a commercial project or whether it is a politically motivated project. It would be lovely to have more information so that we can make a genuine call on that. Of course if it stacks up we should build it. My sense is that it may not, but particularly – and that's because I struggle to imagine that a private investor would commit to such a large and risky project at a time when the market is in the middle of such a rapid transition. So pumped hydro absolutely has a role in the market of the future. Does 2000 megawatts of pumped hydro have a role in the market of 2025? That's a very different question and to me this is a very risky government – beg your pardon. Can we edit that out?

Moderator:

What do you mean by that, Guy?

Mr Dundas:

To me this is a very risky project and not one that I could see a private investor committing to at a time when you have rapid reductions in battery technology, rapid changes in technology across the whole market. So we certainly aren't offering a cut and dried view but I think from a point of view of reliability it's this behemoth coming down the line that does make it very hard for investors to address the immediate gap that the market needs to be addressed.

Moderator:

Thanks Guy, and I'm making it easy this time, the woman just here who's got the microphone.

Speaker:

I had a question for Paul from AEMO, it was reported in the media that the projected demand on the Victorian event was - the projections were lower than what actually occurred and demand was a lot higher than expected. Are you able to share any reasons for what happened?

Moderator:

How much can you tell us, Paul, about January 25 in Melbourne because we remember it?

Mr Austin:

Yes, well it's still subject to our report that we're working on producing to explain exactly what happened and there's other people in AEMO who are closer to this than I am and better able to explain it.

Moderator:

Can you tell us a bit more?

Mr Austin:

But so the reported demands would have been affected by obviously the degree of load shedding and the quantification of the actual amount of load shedding is not a straightforward thing, so even with we call RERT we might call a certain number of megawatts, then the RERT provider only gets paid based on their actual metering data. So there's an ex post analysis required to determine the meter data versus what they record and then they only get paid for what they provided. So it's not able to at the moment explain what the level of demand was, but that will be the subject of our report.

Moderator:

Do you know anything more about it, Guy, from the public accounts and what's known on the public record was this an unfortunate cascade of events or should it not have happened?

Mr Dundas:

So to the particular question of the forecast I can't shed any more light. I think – I don't have a lot to say other than it is that combination of high temperature, you know it was a hot day, hot overnight and demand picked up very early in the morning with those coal outages that obviously saw the system short of supply and that was despite the fact – so you will recall that it was very hot in South Australia on Thursday evening. It was not so hot on the Friday and actually quite a lot of power flowed from South Australia into Victoria on Friday and yet it still wasn't enough. So clearly the system was under a lot of strain that day.

Moderator:

A couple of questions right from the front, first of all the lady just here.

Speaker:

Considering – probably more for Suzanne and to a lesser extent for Paul, considering the governmental issues and the polar opposites of the two

parties that we have at the moment, how much is that going to affect your forward planning? So if you're looking at forecasting and rule changes I mean they've got very different policies that they're looking at putting in place after May or whatever it is they decide they want to do that. How much does that impact what it is that you're looking at putting in place now?

Moderator:

Good question, Suzanne. What happens if there's a change of government?

Speaker:

Maybe when.

Ms Falvi:

I might take that on to explain a little bit about the Commission itself.

Moderator:

Please.

Ms Falvi:

So the Commission is a policy advisor to the government of the day, so we're independent in that sense. We do market design and we also provide advice. The work program that we have on foot– in terms of security and reliability, has been on foot for quite some time and is unlikely to change as well. So we process a lot in the way of rule change requests, there are many rules that underlie both the electricity and gas markets. They are open to anyone to submit a change and when they have been submitted to us we are required by law to see that process through, so it is very much an independent process. We like the market operator and the regulator work through and with the ESB, and so the ESB at the moment is developing the retailer reliability obligation which you might otherwise know as the other non-emissions half of the NEG and there has been a very clear decision by the COAG Energy Council to actually have that done and in place by 1 July 2019, so pretty, pretty soon, and I can't see that changing. It's incredibly important as well, it's a really important back up to make sure that retailers are prioritising reliability in the way that they should and I can't see anybody changing that as a priority.

Moderator:

Thanks Suzanne, and Paul I am interested, does it make your job harder the prospect of an imminent change of federal government?

Mr Austin:

It makes my specific job harder because I've been working on the retail reliability obligation which is part of the NEG and Labor's policy is to bring back the emissions part of the NEG.

Moderator:

Indeed.

Mr Austin:

And see if they can sit down with the Coalition once they're in opposition and get agreement to implement that. So given that I did some work on that I may very well be unable to shake free of the NEG for a while.

Ms Falvi:

Paul will just end up working more.

Moderator:

We have another question down the front just here, please.

Mr Reid:

Thanks very much, Tenant Reid from the Australian Industry Group. While we've all been hearing a lot over the last couple of years about big "p" politics of energy, along the margins there's been a lot of reports of tensions between the AEMC and the AEMO over visions of reliability in particular, are your organisations at war or in creative tension?

Moderator:

Okay, fight it out. Who goes first? You go first Paul?

Mr Austin:

Do we look like we're at war?

Moderator:

Suzanne.

Ms Falvi:

Indeed. I mean I appreciate the plenty of media reporting that has been out there about that, but especially in the reliability and security space we need to collaborate very intensively. There is no point in coming up with a change to the rules framework that doesn't actually work technically. So we do need to work hand in hand. Do we have robust discussions? Of course. In my presentation I outlined that we have been talking about the reliability standard and it's appropriateness but that is what collaboration is about and we have plenty of joint work programs and to the extent that there are rule change requests that the market operator put in they were worked on together. It's what the three market bodies do actually a lot of at the moment and it's just part and parcel of what we need to do in order to make this transition happen. You need to sort of chunk it down bit by bit and work out what needs to change and how we do that and it works best when the three of us are working well together.

Moderator:

I think we can describe that as an impeccable forward defence straightaway. Ladies and gentlemen, I'm very sorry but we are out of time. I want however to squeeze one quick final question in myself, if I may? Guy, Suzanne and Paul, I want to ask you this. If we were to reconvene here in let's say five years' time, same panel, same venue, same topic, do you think we'd be talking about an energy system that's even better and more reliable than today? Or worse and less reliable? There you go, an easy one to finish, first to you, Guy.

Mr Dundas:

I think the market has a strong track record of responding and investing when required and so I think governments only need to throw them a little bit of certainty and they'll latch onto that and respond very quickly. I think there's a massive difference between the Liddell closure with seven years' notice and the Hazelwood closure with five months' notice and I think in five years' time we'll be laughing at how vexed we got about the closure of Liddell and how easily we replaced it but I do think that we need governments to come to the party.

Moderator:

Suzanne, what's your crystal ball like?

Ms Falvi:

I feel like I've just answered that question beforehand, but and perhaps it isn't necessarily obvious to everyone the extent of the work that's being done in order to address these security and in particular reliability concerns as well. The governance that we have in the energy sector is such that you have a market system operator, a regulator, you actually have a rule maker and we all have our roles and we're collaborating really well. We're all working at a rate of knots to make sure that we're facilitating the transition on foot. I'd like to think in five years' time we'll reflect well with the market that's responding.

Moderator:

Paul, tell me this is true that we're heading for a better future?

Mr Austin:

Certainly if we're reconvening in five years' time to discuss this I'd be looking for more Paul Austin's on the panel to have a more balanced discussion. I think the underlying risks will continue to be there. We expect the temperatures to be continuing on their warming trend. We expect the ageing generation to continue to be suffering challenges. But hopefully within the next five years we should be seeing some investments coming through and whether that's driven by government or whether it's driven by market investments, that will be helpful in managing the reliability of the system. I think the other thing which is a source of potential value going forwards is demand response and we're working very closely with ENA and others on promoting our open networks initiative and we're looking for over that five years the maturity of the demand response to evolve and to be a much more important part of the system and with it distributed energy resources, the batteries and the rooftop PVs, better coordination of that will help us to manage the risks in the system.

Moderator:

Paul, Suzanne, Guy, thank you all very much. Now before we finish can I please just say a quick thank you to a couple of people. I want to thank Suzi and the staff at the State Library. I've said it before and I'll say it again because it's true, the library is one of the things that makes Melbourne one of the greatest cities in the world and it's a real privilege for us at the Grattan Institute to have such a close partnership with the State Library of Victoria. I want to thank Megan French. Megan is Grattan Institute's events guru, and events like this can only happen because of her hard work. So thank you Megan, and thank you to you,

our audience, for coming out on this surprisingly chilly summer evening, how ironic. Thank you for your interest, your engagement and your questions. Please keep in touch with us at the Grattan Institute on our website and please keep a look out for future policy pitch events here at the State Library. And finally, ladies and gentlemen, please join me in thanking our panel of experts, Guy Dundas, Paul Austin and Suzanne Falvi.

FORUM CONCLUDED