

The Future of Electricity Demand in Australia

Demand for electricity traded on the National Electricity Market has fallen in real terms for each of the last three years and is now down almost 14% on 2008 projections. This seminar brought together experts in industry, academia and policy to discuss why demand is changing and how it is likely to impact the business of electricity.

Chair: Mr Greg Borschmann, Environment Editor Radio National Breakfast

Panellists: Mr Mark Collette, Group Executive Manager Energy Markets, TRUenergy

Mr Matt Zema, CEO Australian Electricity Market Operator

Mr Andrew Reeves, Chair Australian Energy Regulator

Mr Terry Jones, Business Development Smart Networks, SPAusnet

Mr Tristan Edis, Editor Climate Spectator

Prof Mike Sandiford Director, Melbourne Energy Institute

AUDIO: This is a podcast from [Grattan Institute](#).

GREG: Twenty, 40, 60 years ago Australia's energy future was clear: build it and they would come. It wasn't exactly cargo cult but Australia was, and still is to varying degrees, a captive of geology and extraordinary good luck. Too much luck, as my colleague Paul Cleary put it in a recent book. The bounty is the size of the cheap fossil fuel quarry that we sit on and call home. For more than 200 years that's been a blessing. In the 21st Century when the reality of climate change is tipping anything but a level playing field, that blessing threatens to become a curse.

Of course on the bright side, the sun still shines. And strange and unexpected things are happening. Federal Resources Minister, Martin Ferguson, wants to buy out and close down polluting power stations. And tectonic shifts are occurring in the energy sector, irrespective of which major party pulls the strings in Canberra. After an era of unquestioned exponential growth, how do we explain the fall in non-peak demand, over the past three years? Are consumers finally getting the message and turning off the lights? Is Australia in industrial decline? Are we simply seeing the benefits and the blessing of three cool summers? Or is it all those solar PV panels? These are some of the issues that we'll explore tonight.

And finally, with a target by 2050 to reduce carbon pollution by 80%, how well are we set up to facilitate and to regulate what could well be the biggest shift in the Australian economy ever, transforming our energy sector? Now expert is a word that's bandied around a little bit too freely, but I think the Melbourne Energy Institute and Grattan Institute should be congratulated for bringing together a truly expert panel, with some diverse opinions.

I will introduce our panel and the first question I'd like to ask each of them is: is this falling demand of the last three years a hiccup or a sea change? We'll then come back to each individual guest, to pursue a bit more of their area of expertise before opening up to a slightly more free ranging discussion between the panel.

And you, grand interrogators up the back, get your 25 minutes worth at the end. So get out your pencils, get out your pads, and I want you to ask all the hard questions that I couldn't. Your role also is to be an incredibly enthusiastic audience.

Mark Collette is Group Executive Manager of Energy Markets for TRUenergy. They are an unusual company in that they are both a retailer, they send you some bills, and they're a generator. They have interests in brown coal, in black coal, in gas and solar. So in that sense they're a truly diverse energy giant. Mark, falling demand over the last three years has caught everyone by surprise. AGL, Origin, TRU, you're all projecting no new base-load power is going to be necessary by 2020. What has the last three years of falling demand for energy done to your business model?

MARK: Is it a hiccup or a sea change? We think that's still being worked through. But if you go back and look what's happened over the past three or four years, we think you can put things broadly into four categories. One is just reduced demand for energy, and that's a function of more energy efficiency, so insulation in people's homes, lower wattage lighting, even a bit of price elasticity, as prices go up, people use less power. We think that's adjusting for about a quarter of the reduction. We think another quarter comes from PV, so PV comes into people's homes. Another quarter is from solar PV and we think the other quarter is from industrial onsite generation and other changes they have. Now the interesting thing about that is that three of those four, you're still producing energy, you're just doing it in the home or on the site of where people use the energy, not from the centralisation of the system. So we think one of the things that people overlook at some stage is that the demand for energy has gone down a little bit because there's been some energy efficiency, but the demand for centralised energy has gone down, not the demand for energy as a whole in the same way. The reduction in demand is what we find is the interesting bit. It's the reduction of the need for centralised energy. What does that mean? Is it a sea change? Does it mean the business model of having centralised generators? Big, large, monolithic power stations that use big transmission lines to get big load centres? Is the economics of that falling away? We think it's too soon to tell. If you go through each of the sorts of things that have happened, energy efficiency, what caused that? Well you had the insulation giveaways that were done as part of the stimulus package post GFC. You had some of the energy efficiency schemes that governments have promulgated from time to time. We had incredible subsidisation of solar PV for quite a number of years with a combination of upfront subsidies, feed-in tariffs and all sorts of money that was redirected to get something to grow quite quickly. A lot of that's been unwound, but at the same time costs for PV have come down. So the economics is still to play out. You would think that costs for PV will still come down, but it's not clear that PV will become cheaper and stay cheaper than other forms of power over quite some time. So hiccup or sea change? We still think it's too early to tell, but we think the bit that's too early to tell is the degree of the switch from centralisation to decentralisation, which is a trend here to stay. The question is just how big does it become over time.

GREG: Threat or opportunity?

MARK: Bit of both. It really comes to the speed of the transformation, if you have a transformation of the sector. Let's say the PV went from its current price to 10% of the price overnight. That's a threat but it's not just a threat to our business, it's a threat to how quickly can you implement that? If you get very fast changes that have very transformational effects on markets, you change the physical stability of the system, you change all sorts of characteristics and properties. Then again if PV continues to, and PV is just one of the examples, but if that continues to decrease in cost over time, well you'll probably just get switching in a more gradual fashion and you get controlled reduction in centralised generation. So the impact is not as big as a quick change.

GREG: Matt Zema, I'd like to bring you in here, Matt. You're the Chief Executive Officer of the Australian Electricity Market Operator. You're the operator and the planner for Australia's energy markets, chief forecaster in a sense. With a 14% drop from 2008 projections, did you get it wrong or can you blame someone else?

MATT: I guess the real issue is that forecasts are forecasts. Up until this year we didn't do a full set of independent forecasts, we rely on some of the states to feed us their forecasts then we'd add them up. I guess the interesting thing is to leverage off Mark, what has changed? Is it a sea change or are we just continuing? If you look back over the actuals over the last five years, we had growth, then we plateaued in about 2009/10, and everyone said it was the global financial

crisis, we missed it in Australia, we saw a little bit of it through demand but we'll recover, so don't worry about it. In 2010/11 we saw another drop. And again the modellers said don't worry about it, we're still seeing the last of the global financial crisis and there were floods in Queensland, there were floods in Victoria and that impacted on demand. That's when we sat down and said this is not just global financial crisis and floods, this is actually a change in peoples' behaviours, and more. So again we did the first set of independent forecasts at the end of 2012, which we've published. You're right, there's a drop of about 5.7% between forecasts and actuals for the year. I again agree with Mark, it's about half and half. We put about half of it down to drops in the manufacturing and commercial sectors, and a lot of that is a closure in manufacturing, because a strong Australian dollar is basically shifting the Australian economy, with a move away from manufacturing to services. The other half we actually think is evenly split between some weather correction, the cool summers, the PV cells in efficiency and price. The real challenge for us now is that in the past, we've actually looked backwards at our modelling to predict the future. I don't think we can do that now. We have to actually stop and take stock. We've only got three years of actuals, not 40 years of actuals to try and predict the future. The biggest component we are scrabbling with is the price and efficiency elasticity issue. How much impact does price have on people's usage? How do we forecast that? Therefore how much PV are we going to get? How much are people willing to trade price for either the liability or the clean energy future?

GREG: Just to pick up on that, are you saying that we're now in a position where 12 months, three years, five years down the track we actually can't predict. We're in the unknown now.

MATT: No – I think it's all about scenarios. We'll plan different scenarios and predict under different scenarios. We do that already so we predict under a low economic growth, a medium economic growth, and then a whole range of assumptions under that. The beauty of us doing independent reports like that is we can actually give it to everybody and everybody can go through it, look at the assumptions, make their own estimations on the assumptions, and look at how they would actually do the forecast.

GREG: In a sense though that is already a sea change isn't it, because up until 2007 you could just about put 2.2% in the bank every year.

MATT: Yeah. And I think part of that change is also the fact that Australia has a positive GDP growth. We have had for 21 years in a row. You could almost mirror our energy demand and GDP growth. For the last three years this hasn't been possible because it's actually diverged away. The real challenge is how do we understand that better? I think part of that is this issue of people becoming more energy efficient, reacting to price, and being more conscious about the environment.

GREG: I'd like to come back to that issue later and involve you all in that discussion because I think that's a really interesting point. How much is this the beginning, perhaps, of a break between the nexus of economic growth and energy consumption? I'd really value some input from all of you on that.

Andrew Reeves is Chair of the Australian Energy Regulator. He's been doing that job for the last couple of years and I'm sure he's felt like the last two or three weeks has been an eternity. Andrew, demand is central to your job. We were talking as we came in and you told me that in a sense, the last two or three years have been a game changer. How has the game changed? How much, and in what way?

ANDREW: There are probably two aspects to the discussion on demand. The first thing is the peak demand. That is the highest demand in the network which tends to happen the hot summer day with the coincident load of industrial demand and residential air conditioning demand. The network and the generation system is there to meet that peak demand. That's what drives cost. The other thing that we're seeing is a reduction in people's usage throughout the entire year. And that's the energy consumption. Now, so we have on the one hand some reduction in the growth in peak demand, but we are seeing a greater reduction in the amount of energy. Peak demand is a function of those very hot days. The last few years we haven't seen

those very hot days, and we don't really have a good understanding of what load is sitting out there waiting to be turned on if we come back to those very hot summers. So they do drive costs. What we have seen is a lot of investment in the network being made over the last few years and in this current period being driven by the forecasts in the growth of peak demand which were made three and four years ago, in that time, when there was a pretty good correlation between demand growth and the general state of the economy. And those forecasts were made when there was a lot of residential development in housing development, manufacturing was still going strongly, as was industrial growth and people kept adding to their air conditioner and house size. What we're now seeing though is that that is still there, but people are using less throughout the year. Peak demand has implications for costs, average energy use has implication for price, because that cost of the network is then being spread across a smaller base. The charge or cost to the household is almost irrespective of how much energy goes through the wires on average. The cost is really driven by how much goes through at that peak time.

GREG: I'm wondering if you think that in a sense we've been too spoilt. We've avoided the India option. Investment in the network is based on reliability and reliability is defined as meeting peak network demand. Should we just get used to perhaps only having electricity 90% of the time? Why should we have 100%? There are many other countries in the world that live with blackouts, which I know is politically very unpalatable. Is that a discussion that we should be having in the community?

ANDREW: I think it is. What we have seen in this current period where we've experienced rapid increase in prices, has been a coming together of a number of factors. One, building in the expectation of this constant growth in peak demand. I'm speaking here generally around Australia's circumstances: the weights are different from state to state. But the underlying drivers are pretty much the same. So that growth in peak demand, means you need bigger capacity in the network. Secondly, extending the network to meet our suburban growth. Thirdly, the replacement of ageing assets. A lot of investment went in through the '50s and '60s, that growth, the poles and wires are now getting to the end of the service life and that is having to be replaced at the same time. Added to that, financing costs immediately post GFC were much higher than in the preceding year. So we've seen this combination of events driving a lot of investment, and driving up prices in a very short space of time. Against reliability settings that were set by the states, in most cases, off the back of a general algorithm that people in broad terms were satisfied with a level of reliability or would pay a bit more. I think in hindsight, had the policy makers and everybody else been mindful of this combination of drivers, there would have been different reliability settings. It's one thing to ask a consumer, are you prepared to pay for a 5% increase in network prices for a particular increase in reliability, if otherwise prices are flat. It's another thing to ask are you still prepared to pay that off the back of a 50% increase in charges for the network. I think you'd get different answers.

GREG: I'm sure you would. I'd like to introduce Terry Jones now. He's the Business Development Manager Smart Networks, SPAusnet. Terry is at the poles and wires end of the business and for those of you who can remember the old SECV, the State Electricity Commission of Victoria, Terry's company is now responsible for one of five companies who've carved up that old network. Terry, you see some very specific reasons for the declining average annual demand and you've specifically nailed PV and the weather.

TERRY: I work in the distribution side of SPAusnet. SPAusnet runs the transmission network across the whole of Victoria, we run the gas network in the west of Victoria and the area I work in is in the east of Victoria in the distribution network. So my comments are around the distribution network. What we've seen are two effects. One is basically on energy, that is kilowatt hours usage, and that's been falling off, which affects revenues. The other side of it is peak demand which is what we build the assets for, and really just confirming what's already been said, we've seen peak demand start to level off. Now reasons for this are in terms of energy, primarily weather and PV. By PV I mean solar PV on rooftops as well as gas hot water replacements of electricity heaters. In terms of peak demand, we've seen the peak demand levelling and slight falling off in the past year or so, primarily because of weather. Our main

weather event was 2009 and we've had the cool summers since. We think the forthcoming summer is going to be warmer, but not a real stinker. That's the forecast at the moment and we're preparing our network for that situation.

GREG: You've heard the arguments about the gold plating of networks. How would you respond? Have you got a gold plated network?

TERRY: Not distribution. I think in terms of gold plating, our investment cycles are driven by peak demand at each feeder. Out in the network there are feeders, we monitor the demand, the current, the kilowatts. Where we see temperatures are going to push those feeders over their limits, then we augment the network with switch gear, lines, poles, etc.

GREG: A serious question, do you see or sense that there is an overinvestment in your network?

TERRY: Not in distribution, no.

GREG: I'd like to bring in here Tristan Edis, Editor of Climate Spectator, and also with long and strong connections to Grattan Institute which should be acknowledged tonight. Tristan, you range across the sector. Hiccup or sea change? What are we seeing at the moment?

TRISTAN: I think the question's more about whether we actually need a sea change. Irrespective of whether it is or it isn't, do we actually need a sea change? I think the answer is if we're going to address climate change – if you look at most of the analysts that look at this issue and spend their lives analysing what's the cheapest way for us to reduce our greenhouse gas emissions – by far and away the cheapest is to reduce energy demand through energy efficiency. If we're going to reduce our greenhouse gas emissions and do it in a cost effective way, then the first thing that we should be focusing on is improved energy efficiency and reducing electricity demand. So we have to have and we need to have a sea change. I think that's the number one issue.

GREG: Do you get a sense, though, that the last three years is the very beginning of that?

TRISTAN: Yes there were some forecasts actually produced independently of the electricity industry, typically the electricity industry did their demand forecast on what's known as a top down model. What they do is they watch historical data and look for statistical patterns of macro drivers. It might be that economic growth is number one. So if economic growth goes up by 2%, then electricity demand goes up by 1.8%, or some such ratio. And that's what they did. Then at the same time the federal government had a residential energy efficiency program that forecast back in 2009, before all this hit the headlines, that residential electricity demand would flatline. That was because they looked at it and said actually we're going to phase out inefficient incandescent lights, we're going to phase out inefficient electric water heaters, we're going to do another round of energy efficiency requirements for refrigerators and a whole swathe of other things that they had taken into account and built a bottom up model of what residential electricity demand would look like. Now that didn't incorporate this huge boom in solar PV. Now unfortunately I don't know who's right, but all I can see is at the macro level is demand has stabilised and reduced, but I don't have the same quality of data as say Terry does or Mark had where they can go down into a granular level of individual households and individual businesses and look at what's going on in each of those. I don't have that data. All I know is that we did try. We've tried a lot of different measures. We also have good data on the uptake of solar PV at a macro level. I don't know the generation of each of those individual systems, so we're just doing that based upon averages of what we think a solar PV system would produce, whereas potentially there is meter data that would tell you each household. Do you know what the kilowatts are installed per household such that you could see some of those ratios? Or do you just see the meter data?

TERRY: Generally we know who's connected solar.

TRISTAN: Do you know the size of the systems?

TERRY: From the registration document, yes.

TRISTAN: So you would be able to analyse that. Terry could look at that and say, if someone installs a two kilowatt system, how much actual electricity do we get out of it? Potentially also when do we get the electricity from that system, at what time of the day? I don't have that data. So for me, trying to work out is there a sea change or not, is difficult. I just look at the macro aggregates and then think it would be great if we have a sea change here that is going to continue because we desperately need to reduce our greenhouse gas emissions.

GREG: Tristan, thank you for introducing the C word or the double-C word, climate change, because that was the next issue that I wanted to throw to all of you. Mike Sandiford, Director of the Melbourne Energy Institute, just before we get there though, declining average demand, the end of an era for stranded dinosaur fossil fuel assets?

MIKE: To come back to your first point, Greg, I do see it as a sea change. At the Energy Institute we are doing our own analysis. Admittedly with a different set of data and not the comprehensive data sets that perhaps the others have done, but coming from the point of view of looking at the climate signals, the weather signals and backing out from the way in which the demand from average energy has changed. On the weather side we don't see a signal in the change for average energy demand at all over the year. You can burrow down into the change in demand in the seasons and work those out with a reasonable degree of confidence. You can also ask the question, what would a PV signal look like and how can you see it in the demand? The demand fall in Queensland, for example, is absolutely coincident with midday. It tails off earlier and later in the afternoon, just like PV does. It's there in South Australia as well, and that's the two jurisdictions which have the highest penetration rate. So PV is really changing the game. It's clearly not the only signal. In Victoria the biggest demand change occurs at three o'clock in the morning and that's a signal of hot water services no longer going on off-peak. You can back out the information from the patterns of demand change both in time and space. I see a lot of those things as being ongoing. Underlying it, there is shift in the economy. GDP growth is occurring. We've been in a remarkably energy intensive economy and now we're using less energy to produce more output. It might be involved with structural shifts. That's inherently a good thing. We're becoming less energy intensive, and I think that there's a lot of low-hanging fruit in that game. I don't see demand returning for quite a few years. In fact in the last year, the fall in average demand for electricity across Australia was 500 megawatts. That's far greater than the previous two years and still we have GDP growth.

GREG: Thank you, Mike. I'd like to pick up on this issue now of climate change and a carbon constrained world because the reality is we wouldn't be sitting here tonight having this conversation without that imperative. I suspect that's why there's such a healthy audience here. Mark, I'd like to ask you as a representative of TRU, a company that is in the top five polluters in Australia, putting out 35 million tons of greenhouse pollution every year, do you think about it every night when you go to bed? Does it bother you? Do you think of your grandchildren?

MARK: I have a six-week old living in my room at the moment, and he wakes up every three hours. So I don't tend to think about greenhouse emissions as I am still coping with him. We've obviously been thinking through carbon and climate change for quite some time. In 2007 we launched our climate change strategy where we undertook to reduce our carbon emissions by 35% by 2035 and by 60% by 2050.

GREG: How are you going to do that? Sorry to interrupt, but they're big numbers.

MARK: I'll come to that. But before going to how we might do that, the reality of the energy sector in Australia is you've got two customers, you've got people who use power and you've got governments. People who use power will only buy your product if it meets the needs of what they want, which has generally been affordability and reliability. You'll only please governments if you meet the policy objectives, which used to be affordability and reliability, and now includes carbon policy as well. If you're going to operate in the energy space, and we quite clearly operate in that space, the only way you do it successfully is by planning to hit all three

objectives of the government and all of the objectives of the customers. We undertook to do that in 2007. We've been working on a number of fronts to achieve that. How do you do it? Firstly, we are a vertically integrated business. We have retail and generation. You start with the customers. People don't like paying when prices go up, so if they stop using power, they pay less. So we have been quite active in taking advantage of energy efficiency schemes as a way to send out people to install low-flow shower heads and low-wattage lighting and make people aware of the things that they can do to reduce power in their homes.

GREG: You can make a quid out of that? That helps your bottom line?

MARK: It does. The way it helps our bottom line is that retailing is an incredibly competitive industry. In Victoria we have the most competitive retail market in the world, and you lose three out of your 10 customers every year. So you've got to replace 30% of your customers every year. There's not many other industries in which you have to do that. If your customers don't hate you, which for electricity and banking is a good place to start, then they tend not to leave as quickly. If you actually help them reduce their bill size, then they start to think, I can see that you may be helping me, and if you then can also explain that you're working on a number of fronts in the generation part of your business to reduce emissions and reduce costs, then it tends to be a better message to deal with when prices do tend to rise.

GREG: Eighty per cent cut by 2050 – impossible dream?

MARK: I think it's too early to tell and the reason for that is we're just not very good at forecasting. If you go back five years, you didn't have the forecast going down in the way that they have. If you go back 20 years, I don't think any of those forecasts even had PV growing at the rate that we're now seeing. The reality is that we do get disruptive changes in the energy industry just like everywhere else, and they come in the form of technology, so PV costs are coming down, in the form of exchange rates which again bring PV costs down, and in the form of price elasticity. Historically electricity and gas have been so cheap that there has been almost no price elasticity. To put that in context, we had probably 10 years prior to 2007 when we had CPI or less levels of price increases. We sent out letters in 2007 which put prices up by up to 30% off the back of the drought, because wholesale costs went up. At the time we had a lot of talk about climate change. People got bills that went up 30%. We had almost no response because for the past 10 years it just wasn't a concern. Compare that to the letters sent out a year ago when they went up by about 10% and we were deluged with responses. They were handwritten, we had people come to the front desk, we had all sorts of letters coming back saying this is just outrageous, it's out of control. That was because you had five years where over the course of those five years prices went up 70% and they hit the point where people cared. A lot of it comes down to what the macro environment is, what you are trying to achieve and do we think the environment we're facing, where you can have quite disruptive changes, 80% could be possible. What the exact path is to get there is very hard to predict.

GREG: Matt, I'd like to bring you in here. Essentially we've had two spokes to the wheel, but we're now talking about a different paradigm. We've had affordability, and we've always talked about security of supply. They've been the two issues which have driven Australia's energy market. We've now the environmental constraints of climate change in a carbon constrained world. How is that changing how you do your job?

MATT: It's not changing just for how we do our job but for the whole industry, the government and the community. I think what we described is a triangle. If you go back 20 years, the old SECV, all they worried about was reliability and security. Build more growth, meet the growth, make sure everyone's happy and the lights don't go out. Reliability and security at the transmission level is 99.998% of the time. That's the sort of reliability we are used to. Then about five years ago we actually bought the price issue in. We had 10 years of almost flat price. All of a sudden, as Mark said, 30 price increase, you just absorb it, the next increase, wait on, what's going on. So we introduced a second spoke which was all about price affordability. Not long after, we introduced the issue of a clean energy future. We almost have this three way balancing act. It's quite interesting because as a community, some people are willing to give on those two legs for clean energy and others aren't. Others are only still meddling between the

reliability security and the affordability. Others can't give. It's quite interesting because each of those three has different challenges. Reliability and security, is about the assets, the poles and wires, how we're going to meet the demand. The price is all about affordability. The clean energy future is all about the technology, and technology and the geography. Where are we going to put this clean energy? I think the challenge for Australia in that area is that we really run the risk of being fuel rich and energy poor, both pricewise and also having all the fuel but not being able to convert it because we don't have the technology. They're the three things that we try and advise community, the government, by putting out information to explain to people the different scenarios: what happens if PV takes off, what happens if we get wind in certain areas, what happens if we get a big lump of geothermal? Again, what is the balance between that centralised generation model and the decentralised one? How decentralised will it be? Our national transmission plan has five scenarios where it could go in any five of these directions or a combination thereof.

GREG: Andrew, I'm wondering if environmental considerations play a role in the way that you run your show.

ANDREW: Our work is guided by the National Electricity Objective which is set out to promote efficient investment in and efficient operation of electricity services for the long term interests of consumers. We work under an economic framework. To the extent that there are environmental considerations we would see those being factored in through the costs that the network businesses would bear ...

GREG: But in a sense have they been add-ons? Not core business?

ANDREW: No some of them are explicit obligations. There are other issues such as demand management where we would be looking to the networks to go for the most efficient solution to meet customers' needs. The drive for us is really that growth in peak demand, which is more the economic driver than the environmental driver.

GREG: Terry, I'm wondering how those environmental imperatives affect you out there in the network. Do you see them or are they totally irrelevant?

TERRY: They're not irrelevant because we build across woodlands, we build in closed environments, old housing estates, so all the environmental health and safety and environmental checks have to be done.

GREG: I was thinking of the climate change policy and carbon constraint. Does that impact on the way you run your business?

TERRY: Not in terms of augmentation, no. For example we don't have to use superconductor cables to minimise losses and thereby emissions. So that doesn't touch us at the moment.

GREG: Can you see investments like that being worthwhile in the future?

TERRY: I can't comment on that. I don't know. It's not my field.

GREG: Tristan, you had a bit of a crack at it earlier, but in a sense, is this the overarching conversation when we talk about energy and energy future and falling demand, is this carbon constrained future world, is that what's driving what we're doing here, what we're talking about? Is that what's driving the market now?

TRISTAN: Yes – from all the explanations we've heard here what we've seen with this falling demand is that it is not actually been driven by anything particularly to do with the carbon price. The solar PV growth that we've seen was driven by policies that governments implemented that are not to do with the carbon price. More efficient households have been driven by, to a large extent, probably minimum energy performance standards: so putting in place regulated requirements such that we can no longer sell conventional light bulbs anymore. Also rebate programs that, say for example, may have supported insulation and driven uptake of that and

also driven uptake of solar hot water. So those are greenhouse policies, with the objective generally to reduce greenhouse gas emissions and they are therefore then flowing on and impacting the energy market more generally. So they're affecting the demand for whether we need augmentation to poles and wires, whether we need new generation potentially, and also then affecting the economics of these different businesses. Then flowing through to the Australian Energy Regulator and what Mr Reeves needs to deal with himself is sort of indirectly flowing through to the question whether we actually need to do these augmentations or not. Also price issues: we've reduced overall energy consumption over the whole year but the peak demand hasn't gone down by quite so much. The network was built to cope with that so we are going to have to recover it over a small amount of kilowatt hours. Then energy prices need to go up in order to recover those costs. There are also other stressors going on in the systems. The fact that we've shoved a whole heap of solar into the system means that some people are escaping some charges around the network and network recovery. Then that's forcing the network business into saying I need to recover those costs, I need to change my charges. Mark Collette's business is looking at the customer and saying I've got to pass on these costs some way but it's doing it in a distorted way. That's not perhaps encouraging the right sort of consumer behaviour to reduce peak demand, they're just reducing average demand. So we're facing these other stresses that are coming into the system forcing us maybe to change the way that we price electricity to electricity consumers so that we see the right sort of signals. What's happening is greenhouse policy is coming through in one direction, and then that's affecting the energy market and then that's flowing through to how we structure and price and regulate our energy market. With these things clashing together, change is happening. Whether governments continue to have that appetite to put in place these sorts of changes when there is a cry coming from other parties about lost revenue, higher costs and higher prices, it's hard to say of all those conflicting stakeholders, who's going to end up winning at the end of the day.

GREG: Mike Sandiford, we've heard several of the panellists tonight talk about solar PV. It's been a bit of a wild card. We've seen a boom in the last five years. Prices have crashed 75% since 2008. They will fall again by at least double digits this year. So they're still falling. I'm wondering if you could give me a two minute thought bubble on solar PV.

MIKE: I think it's really one of the wild cards in the pack, which is clearly going to impact the business of supplying affordable and cheap energy when the sun isn't shining in the future. We already see a significant impact in, as I mentioned earlier, South Australia and Queensland in particular. If we were to double, probably triple the South Australian deployment in midday electricity demand, average demand would be below the midnight demand in South Australia. It's having that sort of impact, and that's really going to turn the business model around. The opportunity to make good money in supplying electricity will be restricted to just a few hours of the day in the late evening under those circumstances. Of course that pushes prices up. One of the reasons it pushes prices up for the electricity served over the poles and wires is that it contributes to a dramatic reduction in the productivity of our poles and wires, the amount of electricity we're pushing across them. The cost of maintaining that per unit of electricity delivered over it is going to rise. Retail prices will go up and that'll accelerate the take up of PV, which will drive the costs down, and push the retail prices up for mains electricity. This will go on at least until you've covered all the rooftops.

GREG: This is the AGL death spiral.

MIKE: Well it's certainly related to the AGL death spiral. The AGL death spiral has a different twist on it which is about energy poverty. If you push the prices too high, a sector of the community can't afford it and drops out. That pushes the prices higher. Rich people who can afford it start to use their own distributed energy, that pushes the prices higher and eventually the business...

GREG: Thanks Mike. Let's not go there. There are two issues that I would like to pursue and throw open generally to you. One is the grid that we have and the grid that we dream of having. The other is a bit left field, but I've called it the sceptics, because I think that needs to be discussed in the context of how policy is being rolled out. I would, however, before we pursue those two issues, just like to throw a very specific and curly one to Andrew, because in some

ways you're sitting in the hot seat at the moment, Andrew. We've seen a spike of 75% in electricity prices over the last five years. Clearly consumers are baying for blood. You're the regulator who is seen to be the umpire, and I don't want to imply that you're a toothless tiger, but I think it would be generally agreed that there is consensus that you as a regulator need more regulatory punch. What have you got, and what would you like?

ANDREW: First of all most of the price increases that we've seen around Australia over the last three years have been driven by increases in network charges. And the AER is the body that has been approving those network charges.

As we've illustrated there are also reasons for the considerable investment in the network that has been driving a lot of that increase. Again, around Australia more than half of the increase in charges has been attributable to the growth in the capital base, that is the expenditure on the network to meet growing demand and to replace the assets. Another big factor, and again accounting for about half of the increase, has been our higher allowances for the cost of capital. We do our work under the National Electricity Rules, and those rules were made about six years ago at a time when the Australian economy was growing very strongly, and there were concerns about the capacity of the infrastructure to keep pace with growth in demand. That wasn't just in the electricity sector, that applied to transport, rail, ports and water. The rules were deliberately structured to promote and to facilitate that investment. Time's changed. The rules to give certainty for investment also took the approach that where there were established practices, they by regulators, they would write those into the rules. There were ways of assessing the cost of capital, for example, which I've said accounts for about half of the increase, and accounts for about half of the total charges. As it's transpired, post GFC, financing practices have changed. But the rules have locked the Regulator into adopting a particular approach, which has been a very big factor. The other thing was that there was very much a focus under the rules for promotion of efficient investment: that is the concern that regulators may go overboard, put the cap on the investment and wouldn't be able to maintain the levels of reliability for the community. Again, with that went restrictions on the Regulator's ability to deal with the proposals coming from the businesses. So there were those two big aspects. We got to the end of that first round of determinations when we had done all of the network businesses around eastern Australia, with the exception of Tasmania. From our experience of this, what we saw as being a structure of the rules that led, in our view, to too much on the promotion of investment and not enough attention on the efficiency of the investment. Secondly, deficiencies in the way we were allowed to come to terms with the costs of capital. We put forward proposals for changes to those rules. We went out in September of last year putting proposals to the Australian Energy Markets Commission who were the rule makers, for changes to the rules so that from our perspective, we would be better equipped to deal with excessive demands for expenditure from the businesses, to be able to moderate those demands and in some cases to spread them over a longer time period, and importantly also, to be able to make an assessment of the cost of capital that better reflects the actual financing costs of the businesses.

GREG: Andrew, I'm going to thank you because I don't know whether you've answered the question really well or you haven't answered it at all. Just quickly, over the next five months, the federal and state governments are going to sit down and talk about giving you more powers. What would you like?

ANDREW: The first thing there is that the rules that we operate under are made by the Australian Energy Markets Commission, which is a body independent of the state and Commonwealth governments. Now that process is now well advanced and the AEMC will be bringing out its draft decision very soon. They will then go through a process of taking responses to the draft decision and their timetable is designed to have new rules in place by the end of the year. And that process, as I said, was initiated back in September last year and that process has been running its course and there's been substantial consultation, an issues paper and the like along the way.

MIKE: Andrew, one of the elements in the room here is the growth in peak demand. I can put however many air conditioners I want in my house and as long as I can pay for the electricity, I can turn them on and I don't have to worry about that. You certainly can't regulate for it. When

are we going to allow you to regulate for peak demand? Obviously it's not in the interests of the network operators who get a guaranteed rate of return on investment in growing the grid, as I understand it. It's not there in the business model anyway. Do you see that coming?

GREG: In other words, Mike, forcing the networks to invest in the low hanging fruit first?

MIKE: Well, controlling this thing which is really driving a lot of the issues that we have which is peak demand growth. The issue at the moment is that we haven't had peak demand growth in the last few years because we haven't had hot weather. We just don't know how many air conditioners are out there that have never been turned on – three or four per household? People have made those investments, and when the next hot weather comes they're going to recoup their investments by running them full bore. We don't know what the load be like when that happens.

ANDREW: Mike's quite right. Unless there is a change in usage, there's the risk of this ongoing growth in demand and the ongoing necessity for investment in the network, and a continued increase in prices. That is the key to it. Then the question becomes who's responsible for managing the demand? Ought it to be the businesses themselves, and providing the businesses with the incentives to go for the lowest cost solution, whether that is network augmentation or demand management. That's a very good way of approaching it. The other is to look at the pricing structures such that those consumers who are putting the extra load on the network, with the four air conditioners, are paying for their load on the network. At the moment everybody pays on the basis of average use rather than paying for how much demand they put on the network. Now that's a pretty radical change in the way electricity is charged. That would lead to arguably a much better outcome in terms of the economics, it would then give people the right signals to manage their demand, to manage air conditioners in a way, for example, that the compressor drops off occasionally, the fan keeps going, keeps the air circulating, arrangements to automatically switch off some of the appliances that don't need to be running in those periods, so that's the household management of demand. If customers do get the right sort of price signals, or if other parties like network business or demand aggregators have the financial rewards to be in there to do this, then we can start to see some change. I think this is a major shift in the way electricity is priced. The other thing is we're really just on the threshold of that major technological change where you're seeing the communications technology, the information management moving in parallel with the movement of electricity. We've been dealing very much with a pretty dumb system. We're now seeing through smart meters in Victoria, the notion of the smart grid, the technical capacity for consumers to be managing their own demand in an intelligent way. That does bring extra costs, extra investment in the information management and control, but in a lot of areas it will be cost effective to have that intelligent management reduce the growth in demand and therefore reduce the need for investment in the grid.

GREG: So you'd like to see a market mechanism rather than a regulatory mechanism controlling peak demand growth.

ANDREW: I think that is the first case. There will be areas where the price signals are not adequate. It's a question actually about who bears those costs. It might actually be the customer. The customer might be shielded from those costs if the retailers are exposed to them and the retailers start to explore ways of management of demand. Arguably retailers are already exposed to very high peak prices in the commercial sector through the energy market.

MATT: I think customers face network charges and at the moment they don't have any way to manage their network bill because it's just based on average usage rather than peak demand and they don't get a signal that tells them use less peak power.

GREG: How far are we away from consumers being able to control that?

TRISTAN: In other parts of the world it's already working. For large customers at the moment they can already do that. We have a number of customers within Victoria and Australia who when the wholesale price of power goes high they curtail their usage. Smelters who just stop

hotlines for a couple of hours to reduce their usage at that point in time. The reason they can do that is they can see the price signal. They have a contract which tells them in times of high prices if you turn off you get a financial reward for doing it. And they say, it's worth doing it, I'll turn off. Retail customers don't get any of those price signals at the moment.

GREG: Should they?

TRISTAN: We think they should. We think there's about \$11b of installed electricity infrastructure that's used for about eight days a year, but no-one sees that price signal. If you've got something that's not used very often, it's very expensive. The reality is if you want people to use less of something, charge them what it costs. If they're willing to pay it, they can use it. If they're not willing to pay it, then they'll do something about it. In terms of enablers, though, then you do have to have things like smart meters which allow people to actually see what's happening in their household, and you have to have products from retailers and other participants that can allow them to do something about it. Some of the things that we're exploring in that field are the pricing mechanisms off-time use pricing, linkages to smart appliances, so your fridge, your air conditioner, your washing machine, your dishwasher, can all be interrupted based on a price signal received by the smart meter that turns the appliance on and off. We're getting to the point where we can do that, but we need to have the regulatory infrastructure that just enables that sort of competition and pricing to occur.

GREG: Roll on brave new world. I'd like to finish this part of the conversation with something that I'll throw open to any or all of you. Scepticism. Climate scepticism. Half of US law makers now do not believe in manmade climate change. In some ways you could argue that we've had 10 years of lost policy action on this issue. Possibly in a year's time we may have a doubter if not a sceptic in the Lodge in Canberra. I'm just wondering if what we've talked about tonight, and some of the changes you see being driven at the moment, whether they're going to happen anyway, whether this is irrespective in a sense of any policy settings. Are we seeing something that is almost irresistible and the politics of it are not going to count?

MATT: Just picking up on the last point, one of the issues is pricings. I see it as more what services can my retailer provide to me that add value. That will be price signals, it'll be switch off my air conditioner, it'll be switch off my dishwasher, etc. I see it as a whole different world of where my retailer can provide me a whole suite of services rather than just price. I think that's where they'll distinguish each other. Because we currently have a market that works really well at the generation end where if I generate I get paid. It works well at the retailer end. Again if you don't have a customer, you don't send a bill, you don't get paid. I think the issue we still have is to address the middle bit where the network is and just to address your other point about what's the future of the grid. I think the grid used to be a highway, a roadway between centralised generation to demand. It could be just insurance policy into the future, where if everyone's going to go decentralised, well do I still want the grid to actually back me up, because my solar panels will break down, my inverter will break down, the sun won't shine, will technology keep up with all that? I think a lot of that change is irrespective and is here to stay.

TERRY: Can I just add something to this? In terms of what you were saying about price signals, we already have price signals in terms of commercial and industrial customers where we have a critical peak price signal. They can reduce demand and reduce their electricity bill as a result of that. We don't have that at the moment with residential customers because we don't have the smart meters and the tariffs associated with smart metres. But that's on its way. You shouldn't get the impression we're doing nothing about this and we're just building more and more transformers and more and more wires. We are encouraged as a network business by the regulator to look for the lowest cost, most efficient investment. Included in that is an assessment of demand management measures. Small power stations that can defer a transformer for five years, we benefit from the cash flow on that. Short term peak demand management where we see a settlement that only has a peak demand for three days a year will put in temporary generation and connect it up locally. Things are happening and the regulator is encouraging us to look at those measures. It is already changing. Then you look at the future to say well perhaps the network is one of interconnected nodes. It's no longer transmitting power A to B, it's merely providing security, if the local supplies fail, and interconnectivity so you can actually sell

your surplus. That's a paradigm shift in the way our network operates today which is probably 10 to 20 years away. That's part of the smart grid's vision in terms of the Australian network.

GREG: Tristan, some final thoughts for you. Is the snowball rolling down the hill and unstoppable?

TRISTAN: No. It's not unstoppable at all. Firstly, with solar PV as an example, solar PV costs are declining quite rapidly. One of the key drivers is actually the industry itself saw a change in the nature of the customer that wants to buy it. The nature of the person that buys the bulk of solar PV now is not a person who is so much driven by environmental considerations but rather as revenge against the utility. It's not necessarily a rational one, but also the rational buyer. The person who is the penny pincher, who partly has been antagonised by the price rises to stimulate them to look at alternatives. Now the thing is that that all works right now because of the way that we do averaged pricing. Whether you consume at two o'clock or you consume in the afternoon or you consume at eight o'clock, doesn't really matter and whether you generate at either of those times doesn't matter. But networks are sitting there saying it costs me a lot of money because I've got to make sure the demand's there at eight o'clock in the evening. So networks will inevitably change their pricing structures such that at two o'clock in the afternoon the price that a solar PV owner can recover for their generation will be dramatically reduced. That will potentially reduce the economics, and the attractiveness, of solar PV for customers. We may be seeing those changes relatively soon. Even if PV is continuing to reducing costs, the rewards of installing it could change because of pricing structure changes that will penalise the installation of solar PV versus what we have today. The other thing is on the residential side with energy efficiency initiatives. One of the things that the Labor government committed to in 2007 was a phase out of electric storage water heaters. Those electric storage water heaters in New South Wales and Queensland in the average household are responsible for about half their electricity consumption. That has not been implemented. That particular policy commitment of the Federal Government has not been implemented. With the election of a Liberal government in Queensland and New South Wales, it has quietly been shelved. That would have had a very large impact on reducing electricity demand and greenhouse gas emissions, and it will not be implemented. The Federal Government is quietly ignoring the fact that state governments have dropped that commitment that they had agreed to under the previous Labor government. So, the change is not inevitable, and there are a range of other initiatives that are barrelling along in the minimum energy performance standards side of things, regulating minimum energy performance. They could get dropped as well. This has been a thing that's been under the radar, but the Institute of Public Affairs, which is a free market think tank, is now very, very conscious of this particular issue and also the electricity supply industry are suffering quite significantly from depressed wholesale pool prices due to this reduction in demand. Now they're very conscious of this issue as well that, oh goodness, wait a second, our business is being affected by the fact that government's regulating energy efficiency. I think we're going to see a counter reaction there and if there was a change in government I do think that there are a number of people who don't believe in climate change and therefore don't see an imperative to see change. We would see a lot of these other initiatives fall away. So I don't really see all of this as just being one inevitable snowball at all.

GREG: Some very provocative thoughts to finish there. It's now over to you, the audience.

AUDIENCE: My name is Martin Drerup. Obviously the discussion has been about the reduction in electricity consumption. I'm interested if anyone had any comments on the consumption of gas which is of course the other major source of energy, and possibly consumption of liquid fuels.

GREG: Good question. We didn't talk about other forms of energy.

MATT: Gas wise, we've seen a flattening off in the gas demand as well, driven by two things: basically the weather, and the lower use of gas fired generation. Again it's going to be quite interesting to see how that plays out and I guess we have quite a different usage of gas across each state, so Victoria's got extremely high gas usage for domestic heating. In New South Wales and Queensland the gas usage is basically commercially driven. Again they all seem to be fairly flat. The impact that LNG will have on that industry is quite interesting and I think we

will actually see that reflected right through to electricity prices ultimately. There's actually a lot of work being done in the gas market sphere about how we evolve a gas market and how we actually start pricing gas like a commodity. Gas is also an unknown part of this equation we probably didn't pay enough attention to today.

GREG: Yeah, it's certainly a bigger player in the US energy equation now. Are we going to follow the States?

MATT: With the LNG industry growing at a huge rate of knots in places like Queensland, we're looking at putting in a supply hub into Queensland which would give us a south-east Asia reference price, which actually starts sending signals to gas usage. With the Henry hub in the US, the price has dropped from about 13 or 14 dollars to two. It's really hard to get a handle on what the gas price in Australia is. The electricity market is quite a mature market; the electricity gas market in regard to open and transparency is actually quite a different point in life. We're an energy market operator so we do electricity and gas.

TRISTAN: With liquid fuels I think you need to look at the US but you're starting to see a saturation there as well. Certainly in the US, for example, they're introducing energy efficiency standards for motor vehicles which will actually see that their fuel demand is actually not going to exceed current levels or past historical levels in 2005 until 2030, as a result of their energy efficiency standards. Australia has lagged behind the US on that particular issue. Nonetheless we are seeing a levelling off of growth there to some extent.

AUDIENCE: My name's Ian Light. I'm just interesting in two things which are quite different. First, I haven't heard about solar powered air conditioning which seems pretty logical for Australia as an energy source. The second thing is with the instability in Europe and the Middle East, it's quite possible that Australia may be obligated to take in a huge amount of immigration. How would such a population increase impact on your businesses and is there a game plan to deal with such an eventuality?

TERRY: I'll do the solar powered air conditioner if I may. In my previous life with CSIRO one of the issues around buildings is that 60% of your energy consumption in a building, both domestic and commercial, is around space heating and cooling. Obviously if we can find a mechanism to use solar, bypass electricity altogether, and have air conditioning and space heating and cooling, then that's a magic answer. CSIRO is working on that and has been for some years. The problem is matching the very low price of conventional air conditioning units. The boxes at the moment for solar air conditioning, heating and cooling, are coffin size. But they work. They're quite efficient. So you're right, that is an answer. But we don't today have a technology at the right price and size. I can't help you with the second question I'm afraid.

GREG: Is anyone up for the second question?

MIKE: There's no doubt that population and energy demand are pretty strongly coupled in a global perspective. Our advantage is that we've been so energy intensive per capita that we have a lot of room to move. That's why efficiencies make such a difference, that's why we could absorb quite a lot without losing much and not putting energy demand up.

AUDIENCE: This is a question for Terry, primarily. With your costs going up and your profits going down, do you see electric vehicles as a great opportunity? If so, would you do anything to promote them?

TERRY: Yes – we have a trial run with the Victorian Electric Vehicle trial where we've got three Priuses which we've converted into grid interactive Priuses. We're starting to gather data around electric vehicles. Threat and opportunity. If we can't control the charging cycle of electric vehicles, they will add to the maximum demand coming from a house, at the wrong time. It'll happen when you come home, five o'clock, six o'clock, which is when you're running the air conditioner. That's the threat if we can't control the charge cycle. The opportunity is to control that charge cycle, shift it into a trough area of demand, or even use the spare capacity in the battery to help you manage peak demand in the home. The vehicle comes home, it supplies the

air conditioner, the network doesn't have to do that, and then it charges up later on in the evening. So electric vehicles, when they happen, are both a threat and an opportunity to our network business. We as a business are already active in that area trying to find out more information and educate ourselves how they might interact with demand.

MIKE: Just following off that question, I am interested in a comment from the panel about where are we in relation to battery technology in terms of both at the household and perhaps as part of the network as well.

MATT: I think that storage technology will be the major breaker in the whole area of the balance between clean energy price and reliability and security. At the moment we don't have the storage capacity at the grid level. And the cost is still quite high at the domestic level. I think that the key area to unlocking this whole future is what do we do with storage. I think it's a balance between localised storage and grid type storage.

GREG: Any sense of whether we're five, 10, 20 years away from that Holy Grail?

MATT: I don't want to give away anything, but I've been in this industry for 30 years and it's always five years away. I'm still told it's five years away.

MIKE: It is always a long way away, but a part of it is factoring the cost. We understand we're paying a huge premium for maintaining that large size grid. Last year in Victoria we had three hours over nine gigawatts of demand. The grid is probably scaled to about 11.5 gigawatts. We're using virtually none of that. Our ratio of average demand to peak demand is somewhere down around about 50%. It used to be up closer to 70%. Now that's got some weather cycles in it, but it's falling. Getting storage to curtail that peak demand and saturate the troughs is going to be a key thing to pushing that productivity up. And that's a huge issue for the country. Here we have this asset, this transmission which is being used each year at 2% less efficient rate. That's a huge productivity loss.

GREG: I guess the question was how will that technology change what we're doing now? Does anyone want to pick up on that?

TERRY: We're doing some work at the moment with storage, both at a residential and as a pre-emptive move to vehicles becoming batteries on wheels. The second area is network storage which could actually be more beneficial. If you look at the typical cost of a megawatt of diesel gen sets with all the bits it is about million dollars a megawatt. Typical costs of a lithium system at the moment is about four and a half million. It's got to come down a long, long way through mass production and chemistry before it's even cost effective, let alone the most efficient investment for us. Projections are out to 2020, 2030, before it might get down to the right level of solar. It's a bit like the solar story, it's always coming down, and it depends on volume and chemistry.

TRISTAN: I've got a plug. Check out my website tomorrow. We've got an article run by a guy who works for *Better Place* which is an electric vehicle company. His view, and he is a chemist by training and he's got quite a reasonable grasp of the issue, is that this is not like computer chips, batteries are not going to follow that same sort of incredible cost reductions, that sort of exponential change in performance. His view is that we've been working on these for over 100 years, they've had value for a long time. It's not like this is some product that we haven't wanted and haven't been working on, like say solar panels where there wasn't really that requirement because we had other good quality alternatives. His view is that there are some fundamental limitations that mean it's not going to be as radical perhaps as what we've seen with some other technologies, but no-one really knows until we're there.

AUDIENCE: My name's Ray Colidetti from the Merri Creek Residents Group. Our issue is topical about what's been discussed tonight, it's about the comment about gold plating the grid. We have a case study with the Brunswick Terminal Station, a new 66 kilovolt terminal station currently on the drawing boards to be situated in Brunswick in a residential area. Part of the challenges faced by SPAusnet is how to integrate that facility in a residential area. We have had

conversations with APANSA on what is a safe EMF level for 24 hour exposure for residents living around the facility, and under the 220 kilovolt transmission lines that come in through Preston and Reservoir where there's houses directly under the transmission lines. We know that APANSA's saying there is no safe EMF level for residents suffering 24 hour exposure, yet this project has been pushed through saying that there's no proof that it's dangerous. We have the World Health Organisation saying that levels of around 3 milligauss, the incidence of childhood leukaemia in a population tends to double. The projected levels around the facility are four to nine, peaking at 28, and under the transmission lines peaking at over 50. The question I have is to Terry from SPAusnet, and also the Australian Energy Regulator and AMO, is why is there a reluctance to have a town hall meeting to fully inform the residents of both sides of the story, like what the pluses and what the minuses are, so people are fully informed? Also, how is this to be managed in the overall demand for a new terminal station? Do we still need it considering that the forecast for this supply was made back in 2006 based on what we've heard tonight that demand's tailing off and not increasing? Why is there no independent review panel reassessing the terminal station? Thank you.

GREG: I always knew the hardest question would come last. Terry, I'm going to give you a bit of cover here because it sounds like that's the sort of question that you would need to take on notice. Perhaps give us a brief response, but it sounds like a complicated local issue.

TERRY: Yes. It is.

GREG: I'm sure you're prepared to engage with our group.

TERRY: I'll pass your question on to our Mr Lyle Johnson. He's our Communications Manager. I believe he's dealing with that situation. I know nothing about it personally.

GREG: Matt, can I throw this one to you in a general sense? This sort of throws up the pointy end of the grid, doesn't it?

MATT: In a general sense, there's a number of issues. One, Brunswick already exists. It is there, it's being augmented, right. The reason for the upgrade to Brunswick is actually about reliability and security of supply around the area and into the CBD. It's actually not related to load growth. It's actually about making sure the CBD is actually secure and reliable. I believe there's been a number of interactions with the group and I believe that they'll continue.

AUDIENCE: Terry mentioned that distribution businesses look at non-network alternatives as part of their cost projections to the regulator. I think my question is to both Andrew and Terry. Why do we continue to see network alternatives instead of non-network alternatives when, for example, as we've heard tonight, PV prices are falling quite significantly? Also AEMO has just recently reported that 38% of PV capacity is generating during summer peak demand.

ANDREW: There is a requirement for major investment in both the transmission and distribution networks for major projects to go through the regulatory investment test. That requires the network service provider to evaluate all of the options including network options, demand management and generation. Those things are public consideration, and we also come back and examine how well those tests have been carried out and we look, for example, at the Brunswick Terminal Substation. In addition to that, through the determinations we also make allowance for expenditure for demand management from the network businesses. We've seen a lot of expenditure being approved in Queensland, for example, less so in other jurisdictions. Then a lot of that depends on the local circumstances. In addition to that, the network businesses do get a benefit if they can defer their expenditure on the network. So there are also financial incentives for the sheer demand management. Having said that, the AEMC, Energy Markets Commission, through their current review called Power of Choice, has also examined these things and has observed that there are distortions here, that is in some cases the rules may operate such that the businesses have more incentives to spend on the network than to spend on demand management. There are some issues there in how the rules work to make

sure the rules work even-handedly for demand management and investment, to just see that we end up with the lowest cost solution. Terry?

TERRY: Yes. I can only say that it is a new exercise and I work hand in hand with our planners in the company so that when they are looking at augmentation, they will take our views into account and see whether there's an alternative method. If we're only building augmentation for three days, I'll put generation in rather than build the cables and transformers and switch gear. It is fairly new, but we are active in that area.

TRISTAN: Can I just make a brief comment on that? The way that the current structure works is there's an issue around timing, and there's an issue around obligations and expertise. At the moment it's discretionary. For example, you've said you want to build poles and wires, that's your core business and that's the way that you grow your asset base, you grow your revenue and potentially provide higher rewards to your shareholders. That's what you know and that's what you understand. But you've got an obligation to go look at some other stuff. Terry, for example, has been hired because his professional business is to worry about demand management, which is a great thing. So SPAusnet are obviously trying to augment that capability. But then the other side there's this stick hanging over him and over SPAusnet which is if you don't deliver your reliability requirements, we will penalise you very, very heavily. So on one side you get to grow your revenue and you understand it, you understand that business building poles and wires, on the other hand you'll get absolutely penalised if you don't meet your reliability requirements.

GREG: Andrew's nodding his head here, so I think you're on the money.

TRISTAN: So what happens is you go to tender, you say I'm looking for alternatives. You've got six weeks or maybe it's eight weeks, but hopefully they're actually building up before they do the tender, that's what Terry's trying to do, and then they say go and give us some demand management stuff and it's got to be 100% firm. It's got to be just like us building our poles and wires. Naturally those people take a little while and they're not ready to deliver a tender that's fully fleshed out. Then if they do come forward, what the network business will do is say okay, now I want you to put down a bank guarantee of several million dollars if you do not deliver the reliability that I need at the point in time at which I do it. Then suddenly it all becomes too hard and the proponent backs away. My personal view is forcing the network and driving the network business to go do that is not the right recipe. What we should be doing is having a parallel process run by a government authority that is tasked specifically with reducing demand and doing it at cost lower than what it cost to augment the network to be doing that themselves. They are assessed by key metric which is seeing reductions in peak demand, and doing it at a cost lower than it would be to augment the network. They have the motivation and that driver and they are accountable on that basis. And the network business worries about reliability. They do that, and someone else worries about driving peak demand because in fact, for demand reductions, you don't need to go via the network. Anyone can go and do demand reductions and you don't have to have the network sitting in between. The issue is who pays for that services, that peak demand government authority to do that? That's where everything falls apart.

GREG: Gentlemen, we're just about over time. In fact we're slightly over time but I'm going to ask one final quick question and a quick answer.

AUDIENCE: This is Yung from ABB. Just a quick question about the smart network. As far as I know you guys mention some smart metering has been implemented for some major commercial customer. I'm just wondering from the operation point of view, as far as I know you have to have system modelling and automatically process automation. I just want to know, from the operation point of view, are we ready for that?

TERRY: The reference I made to commercial in the industrial companies is that they already have three phase interval metering. Regarding the rollout of smart meters I think latest figures are we've got about 300,000 out there due to be up to 500,000 by the end of the year. Once we've got that we've really got an insight into residential use. When we get that insight, I think

we can manage demand a lot more effectively. But you're right to say the back end systems and all the software and all that is a big exercise. We are very active on that, yes.

GREG: Ladies and gentlemen, I think we've been very privileged tonight. This has been a quite remarkable wide ranging conversation. Perhaps we didn't get into some of those other non-electricity areas like we should have. But nevertheless incredibly illuminating and I'd like you to thank Mark Collette, Matt Zema, Andrew Reeves, Terry Jones, Tristan Edis, Mike Sandiford and also the Grattan Institute and Melbourne Energy Institute for a pretty informative evening. Thank you for coming.

SUSANNAH: And we would like to thank Greg for leading an excellent discussion and thank you to the audience for your contributions. We hope you can all make it to our final seminar for the year on 15 October, looking at the future of the carbon tax in Australia, led by Ross Garnaut. For event updates please sign up to our email list or the Grattan Institute email list. Thank you, good night.

End of recording

AUDIO: This has been a podcast from Grattan Institute. Want to hear more? Check out our [website](#).