

## *Policy Pitch - Shock to the system: why power use is falling but bills keep going up - Melbourne*

Governing will almost certainly become a lot harder in the next 20 years. At this seminar Grattan Institute's Energy Program team highlighted some of the most pressing problems facing the Australian electricity sector. Falling demand for electricity has been a continuing trend for a number of years. The trend has major implications for the value of assets in the energy sector.

**Panel:** Tony Wood, Grattan Institute, Energy Program Director  
Lucy Carter, Grattan Institute, Energy Fellow

**Moderator:** Rob Gell

LUCY CARTER: The format for tonight is that I'm going to provide a brief introduction, then we'll switch to a formal Q&A with Rob Gell and Tony Wood and also with myself participating, and then we'll hand over to you and we'll take some questions from the audience. I'd just like to start by acknowledging that tonight's event is held on the traditional lands of the Kulin Nation and I wish to acknowledge them as the traditional owners. We would also like to pay our respects to their Elders and to the Elders of other communities who may be here.

So welcome, this is the first in a series of events that will be run jointly between the State Library of Victoria and the Grattan Institute. We'll be holding one a month for 2014 and we'll see how we go beyond that. We've obviously got tonight's event, [Shock to the System](#), there's also an event on the 18<sup>th</sup> of March which will be our next one which is called [Global Influences on Australia](#) and that will be featuring speakers from the Grattan Institute and also from the Lowy Institute. We'd also just like to put in a plug for an event on the 27<sup>th</sup> February with Melbourne Energy Institute which will be on [Energy Storage](#), so a related topic to this one.

So, something strange is happening in our power markets. Just putting you onto this slide here, you can see the red line there. In the past seven years, electricity consumption has fallen by 7%. Now, this is unprecedented. If you look at graphs of electricity consumption in Australia going back to the mid-1950s – and we have them – they have pretty much ticked up year on year, far more consistent growth than, say, economic growth. Even through economic downturns, electricity consumption has still progressively ticked up year on year. And it did so consistently every year up until the early part of this century, and then we started getting a couple of down ticks, and then in the past few years that's become a consistent trend, and so much so that many didn't see it coming. And this is being driven by a range of factors: things like higher electricity prices, people using less power in response to that; solar PV which, just as a technical note, actually doesn't count from the systems perspective as a rise in electricity generation, it counts as a fall in consumption just because it's actually on the home so it tends to get measured on the other side of the meter, so it looks like energy is falling even if that's just from people generating power through solar; also, appliance standards have played a role, things like more efficient refrigerators, televisions; and also what we've seen, and I think this has been re-emphasised today with the announcement of the closure of the Point Henry Aluminium Smelter, that there's been some structural changes going through the economy such that the economy is, for the same level of economic output, using less power.

So, that's all well and good, but basic economics would suggest that when demand for a product falls that should mean the prices fall and that's obviously not what's happened. What we've actually seen over the same seven years is an increase in nominal electricity prices of 85%, which is well above inflation. Inflation-adjusted, that comes up to something like 60%. So it's a massive increase in a very short space of time. And the question that we're looking at in this report is what's going on with that?

And what we see on this next slide is that the critical part of this picture is this electricity network section in the middle. And if we look at what a power bill is made up of, there's really three or four big components: wholesale costs, which is the cost of generating power in a power station which includes green costs, so things like paying for the Renewable Energy Target, carbon efficiency schemes; then we have the electricity networks.

Now, these networks operate in a very different way and the key thing with electricity networks is that the owners of these networks are monopoly owners and because they're monopoly owners you can't expect the market to be competitive so what we do is regulate that market. And the way it's regulated is that the regulator says to these businesses, "You've spent this much money. Each year, you're allowed to recover a portion of the amount that you've spent plus earn a return on those assets". Now, this works reasonably well when consumption's going up because over time more and more assets get built, the price of building those assets gets spread over a bigger and bigger pool of electricity sales. But what we're seeing now is a situation where these assets have been built, they usually have a life of, say, 40 years that they're being paid off over, but some of those network assets may not be required because we're not using as much power. And if you're taking the same value of revenue that needs to be recovered and you're spreading it over a smaller and smaller pool of megawatt hours being used, what has to happen to recover the same amount of revenue is that prices have to go up. And that's really where we're seeing a lot of these cost increases from.

And what we're going to discuss tonight is this particular issue and the fact that really this is a diabolical problem. And this report that we released last December didn't seek to answer all of those questions; this is really the first in a couple of pieces that we're planning to release on this particular subject. But just one critical thing in this is that one aspect of why these network prices are going up is that there may have been excessive expenditure on these assets, and this is the media term, you get this gold plating discussion. And that's a problem and we've written about that previously, we put a report out in late 2012 which looked at this issue. But there is also a more fundamental issue here, because what we're seeing is changes in the way people are using power. We're seeing a situation where people are installing solar PV and using different types of appliances in different ways, and what that's resulting in is a situation where these networks are having to spend money on assets and that's required in order to make the system function, but at the same time people are saying "Well, hang on a minute, we're using less power, why are prices going up?"

So it's not simply a case of saying that they shouldn't be spending as much, because in some cases they need to be spending money. So what we're going to be looking at certainly over the next 12 months is ways to address that and tonight we're going to open it up to the Q&A about examining the problem and touching on some of the potential solutions or areas where this could be resolved.

ROB GELL: Thanks Lucy. This is where I take over and try and have an intelligent conversation with these people who know this topic very well. You called this a despicable problem. I was going to say that Ross Garnaut might call this another wicked problem that we really need to understand. So if I just take your example today, so that we're all really clear on this Lucy, the announcement today, for example, that Point Henry is going to close down, that feeds right into this. So we've not only got some workers that are going to not have jobs soon, but people are going to be paying more for their electricity anyway because there's less demand on the network, but we've got to distribute that cost of running the network with fewer people. Is that my reading?

LUCY CARTER: Yes, look, Point Henry's an interesting scenario because there are long term contracts in place at the facility, so in some respects they're paying very low prices for their network

costs at the moment. So in terms of the total power system, they're a huge component of electricity used by this particular facility. I mean, I don't have the numbers, it's probably about 1.5% of all the demand will be by the Point Henry facility. It's big, big numbers. But in terms of the overall effect of that particular facility closing on overall network costs, we estimate that it wouldn't be that large.

The challenge is really just that there has been a broader restructuring of the economy and there has been a number of these closures and issues around Ford closures, Holden closures, Toyota closures, Point Henry and Kurri Kurri Smelter in New South Wales; all of these have a cumulative impact. And when those facilities close, if those network assets still need to be paid for they will be covered by other users.

ROB GELL: What are the other things that feed this wicked problem? The price of energy's gone up; we've learned to use less; we've learned to become a bit more energy efficient; we've got some better appliances, we were discussing televisions have gone from the old ones that weighed about 100kg to plasma and now we're back to LED, so there's big some big shifts in the way technology's evolved; and we've got solar panels on rooftops.

TONY WOOD: I think unpicking all of this is a big challenge and some have tried to do this, it was almost beyond our ken to try and have a go at that because everybody's got their own favourite reason as to why we're using less electricity. So we decided look at just the analysis that it is falling, as Lucy said. It's actually quite a challenge obviously to make sure that we can still get the electricity that we need at certain times of the year, but effectively the productivity of the system, that is the amount of electricity per dollar of investment, is going down significantly. Now, that means that we are making a lot of decisions. It's not because we're making the wrong decisions most of the time.

One of the things that's feeding this diabolical problem is that the network tariffs are on a variable charge basis. So what that means is that you would think if you're paying \$220 a megawatt hour for your electricity and you reduce your consumption by one megawatt hour you'd save \$220. It stands to reason. But because the network costs represent 40% to 50% of that \$220, the actual cost to the total system when you reduce your electricity consumption by one megawatt hour is only half that. So that means two things happen: firstly, you don't get what you thought was going to be the benefit of reducing your consumption; and secondly, the networks then will basically adjust, as Lucy said, their unit price so that the total revenue they receive on their asset is exactly the same.

Now, that's quite different from a competitive market, but this is basically a regulated monopoly and the idea was that in return for providing that network we (all of us) would basically pay a charge related to the total revenue to give a return on that investment. That was the deal. Most of us haven't signed the contract on that basis, but that's the deal implicitly we've signed up to. And the challenge we've now got is what do we do about this because it's bad news for us as consumers for the reason Lucy mentioned, but potentially also bad news for the network companies because they're seeing this fall in demand. Where does this go?

ROB GELL: There are a range of price inequities at the residential level too aren't there? I mean, if I don't have an air conditioner in my house and my next-door neighbour has got six, do I really think he's paying a fair price for the electricity he's consuming?

LUCY CARTER: Yes, this is a real challenge because looking back, even as recently as 15 years ago, people had roughly the same appliances in their houses which they used in roughly similar ways and what we've seen is two major changes in the market. One is air conditioners. Now, air conditioners are a problem because they use a huge amount of electricity but people don't switch

them on very often. So what you end up with is they push up the peak demand of electricity, so there's this concept in the network that effectively you have to build a network to fit the maximum amount of electricity you've got to be able to supply at any given point in time. So if you think of the electricity network like a football stadium, you've got to have enough capacity in there to cater for Grand Final Day, and Grand Final Day in Australia is typically a hot summer afternoon, like over the last couple of weeks, where everyone switches their air conditioner on.

But the problem is, you've then got to recover those costs over the course of the year, and what we have seen in Australia is that starting from, say, maybe about 10, 15 years ago, we only had penetration rates of, say, about 30% of air conditions. Now those are up in the mid-70s. But as a consequence of this, we have a situation where more network assets needed to be built to accommodate this and, at the same time, people aren't actually using enough power to pay for those network assets to be built at those times. So what happens? Power prices go up at all times and everyone pays for it, whether you have an air conditioner or you don't have an air conditioner. Solar is almost the reverse problem, that it's not necessarily generating its maximum output capacity during those peak times, which often occur later on in the afternoon, so after the sun's started to set. But it is making people use less power over all other times, so it means they're using less power but putting the same pressure on the network, and that's putting costs back on everyone else to cover the additional network costs.

ROB GELL: And is residential PV a problem also for the people transmitting the energy that actually don't know how much to push down to where the demand is?

LUCY CARTER: Oh, it's a big problem and it creates a scenario where in some cases certain location-specific areas may need upgrades and they need upgrades to accommodate fluctuations that happen because if you've got a solar panel on your roof and a cloud comes over, the power drops out straight away and the infrastructure isn't necessarily set up to accommodate that. And it's not necessarily set up to accommodate a scenario where you end up with a huge amount of output from a lot of solar panels that are pushing power back up the line where they're designed to flow back down the other way.

ROB GELL: Now, in your paper you've presented us with three initial things that we really need to pay attention to, we probably should go through those and give you a bit of time to just explain what they are. But the first is, let's not keep spending too much on the network.

TONY WOOD: I think the challenge here has been, as Lucy said before, we've had a forecast of rising demand and the reality was demand had been rising for decades. And so it wasn't unreasonable under those circumstances to say okay, in that case we'll allow these businesses to invest on the basis of that forecast. But what they didn't do was realise that as demand started to diminish and eventually has been declining, as Lucy said, that meant that a lot of those capital forecasts were no longer correct. So what it means is you can no longer depend upon these forecasts so how do you introduce greater flexibility into the way in which we forecast capital investment to make sure that we're not over-investing in the network? And it's easy to say "It's the regulator's fault" or "It's the company's fault" or someone else's fault. The problem is the system was never designed for this. It's solvable, but it requires fundamentally thinking about the way we do this in a different way.

ROB GELL: Okay, well let's assume that everything you say is true, what should government be thinking about to solve the problem of over-investment in the future of the network? Surely they need to do that pretty soon?

TONY WOOD: On that particular issue I think the real challenge is to be, as you would in any industry – in the competitive market what you would do is of course you have a five-year capital plan or a ten-year capital plan, but then you'd revisit that regularly to make sure that what you based that capital forecast on is still actually happening in the real world. So what you need is a basic relationship between the companies and the regulator and the electricity market operator who's understanding what's actually going on in terms of supply and demand and ensure that's a much more responsive system. It's possible to do and I think people who are really looking at this are certainly on the game, but the question is can we now move to that new system from where we are today?

ROB GELL: I'm sure there'll be some more about that in your paper to follow. Do you just want to tease us about how that might happen?

TONY WOOD: In the short term, I think it's going to be painful for a little bit as everyone starts to adjust to this new world. I think you've got to open up, as I said, a very constructive dialogue between the companies and the regulator.

ROB GELL: Okay. Now, the second point you make as the major plank in terms of reforming is about tariffs.

LUCY CARTER: Yes, and this is a really tricky one and this is what we're focusing the majority of our efforts on at the moment. There's a real challenge here that the price that people pay for electricity doesn't necessarily reflect the cost of electricity and the cost they're putting on the network. And let me just give you a brief example of this. If you have a 5kw air conditioner installed in your house and you use that for five hours on a hot summer afternoon and you do this for ten days a year, only on the hottest days, you might pay in the order of \$60 extra for running that appliance. If you look at the cost of running that appliance on a peak day, which would typically occur during the period that you've got it on, it might be, say, \$1,000. So the cost on the network is \$1,000 and the amount that you're paying is \$60, so where does the other \$940 come from? Well, everyone else is paying it or you're paying it at other times of year.

So there's big numbers here and the price that people are paying for those services like air conditioning don't reflect those numbers obviously. So what we really need is a situation where the tariffs that people pay for their electricity reflect the costs that they incur on the system.

ROB GELL: So this is like putting a price on carbon? We're going to internalise some externalised costs? We could use a Smart Meter to do this, couldn't we?

LUCY CARTER: Well, funny you should say that, and it is one of the challenges. And in Victoria, we're very well-positioned to deal with this because we do have this infrastructure in place. Now, I haven't met too many people who have a glowing review of the process by which we got that infrastructure in place, but the fact is it is out there and it should be being used.

Now, the real challenge of that is how do you do it in a way that, firstly, it doesn't just alienate people, because I think people are starting to get very disillusioned with their power companies and the power company comes along and says, "Oh, guess what? We've got this brand new charging structure and it means that you're going to pay very high rates for electricity at certain times of day" and it would be hard as a consumer not to view that with a degree of scepticism I'm sure. But at the same time, if you don't do that you end up in a situation where if you don't have an air conditioner installed you're still paying for your neighbour to have that air conditioner installed. And that sort of situation is something that we need to start fixing. And we're actually already seeing it. A lot of the retailers now you'll see



will actually have different tariffs in place if you have a solar system installed or if you don't have a solar system installed. And what that's really reflecting is the fact that fundamentally this big network costs a fixed amount to build but you're paying for it on a variable rate. So basically what that's trying to reflect is that if you've got this system installed then you'll pay a higher fixed rate to accommodate for that.

ROB GELL: And that's not the only tariff in the system is it, what we pay at our homes? Do we need to look at this 40% to 50% that's guaranteed to the middlemen?

TONY WOOD: I think this is a fickle problem in the sense that you've got to unwind what we've got and then replace it with something else. So for example, most of us would know that if you worried about the load you put on the freeway it makes a big difference as to whether or not you're driving your car at five-thirty in the evening or five-thirty in the morning. Now, if you're driving at five-thirty in the evening logically you should be paying more in terms of trying to reflect the cost of meeting the peak requirements on the freeway. If you're driving at five-thirty in the morning, who cares really? And so the dynamic pricing you would need to address the problem that we've been talking about is going to have to change significantly.

Now, that's not easy to do and it'll be one of the challenges for a combination of the people in the industry, including governments and regulators, to work out yes, we have a problem, yes, we understand the nature of the problem, but what really are the solutions and making sure that the solutions don't make it worse. Because in the energy industry, across the board over the last several years we've seen lots of attempts to regulate things or put in place new policies and often they've actually made things worse. So one of the challenges here is to make sure that whatever changes we make to the way we charge the network tariffs we actually make the problem less serious.

ROB GELL: Now, the third plank in this paper – which is an extension of what you were just saying, Tony - is to review the value of the network. Now, I was with interest looking at some things, I was going to ask you: are there other examples around the world? And I know that, for example, Germany is looking at much more of a distributed system. We've got all of our energy in Victoria being generated in the Latrobe Valley on all that cheap brown coal and pushed around the state. How do we revalue a network like the one that we have which is very centralised?

TONY WOOD: If you look at the generation side of things where it's a competitive market and the power generators compete together and, to some extent, in their investments they take the risks of changes in volume. What we're now seeing, which is a result of the falling demand, we've actually got surplus generation in the electricity generation market. That means those companies are taking a hit to their bottom line now and at some point those power stations may actually close down, and you may have seen today the prospects of what will Alcoa do with the Anglesey Power Station that was previously supplying about 30% to 40% of electricity for the Point Henry Smelter. What's it worth? So, that's reasonably straightforward.

The regulated monopolies on the other hand is a different deal because in exchange for what was supposed to be relatively low returns and no competition, they were given a deal which said "You're not going to have competition, you're going to get low returns, and you're not going to be subject to this volume variation". It was the implicit contract tier. Now, if you've got falling volume and if we are starting to see a situation where some of those assets are no longer needed or wanted because we're using less electricity, then who pays for that? Is it we, the consumer, who continue to pay higher prices as the companies maintain their revenue stream because, in some ways, that's what we signed

up for as a community? Is it the government? Do the government say "It's our fault. We're going to pay the companies to write off the value of some of those assets"? Or is it the companies themselves? And they will argue, quite rightly, that that wasn't part of the deal we signed up to. At some point something's got to give because this could get progressively a lot worse.

ROB GELL: It's what you refer to as a death spiral.

TONY WOOD: Yes.

ROB GELL: You need to just perhaps talk about that because it's something we're going to hear again I suspect.

LUCY CARTER: Yes and what we're seeing here is a situation where all of this isn't happening in isolation; this is not just a conversation between users and the networks. You've also got this force out there which is that people are finding new ways of generating power and we've seen this with solar PV. And we went in Australia from having a situation where there was around about 100,000 PV systems scattered around out there back in around 2009 to, over about five years, 10% of households had them. And the key breakthrough point was it started to become economically effective for people to put them on their roofs. Now a lot of that was subsidies and that was policy decisions, but it was also a falling component prices, falling equipment prices. The key point is that once something becomes economically viable, individuals start making rational decisions to find a different way of doing things.

So solar PV costs are much lower and there are forecasts that they'll either stay low or continue to come down a bit. And the other element is battery storage and we've got storage costs which have traditionally been very high, are probably still too high to make it efficient for a normal house in the city to go and install those systems, but they're coming down. And if we start to reach a point where the costs of putting a few extra solar panels on your roof and putting in a battery storage system is economically viable and competitive with your retail power price, then people are going to start doing that. And as they do that, demand falls further and that pushes network prices up further and that makes your storage system seem even more attractive. And what you can end up with is this situation where the three of us are the only ones left on the network and we're each paying \$1 billion a year.

ROB GELL: We've got a question like that suggesting that some of the technology innovations that might help, such as neighbourhood-based battery banks, require change in regulation of the grid. Which agencies and governments are in a position to address these regulatory and administrative barriers? So who do we have to talk to?

TONY WOOD: I think you've got a situation now where the basic structure of the way the grid is charged and regulated was based upon centralised electricity going out to consumers, and now we're seeing that fundamentally challenged. I don't think there's anybody who fundamentally objects to at all the concept that it makes sense to have distributor generation, that's rooftops for businesses or homes or even for utility-scale solar embedded in the network, and you've see that not so much in Australia but other parts of the world particularly in Europe, that sort of thing happening. But it does mean that those systems have to be able to be connected to the network and interact with the network in a way that doesn't disrupt the physical flow of electricity because the system was designed one way. So you've got a challenge now to make sure that that regulatory process works, and I think we will see, and I'm quite confident we will see, a cooperative discussion between the companies and the regulators to make sure that we can make those adjustments. But it'll be clunky and I think we'll see some stresses and strains along the way, as this process proceeds.

And I guess the important thing is that it starts now because I think people would feel – for example, if you got yourself into a situation where it made sense for you personally, either economically or for social reasons you decided you wanted to get off this damn network because you didn't like your power company anymore and you could put in PV and batteries, and the company then "Oh sorry, yes, that's fine but we're still going to charge you for the connection fee because basically we're stuck with this cost" I think most of us would say "Excuse me, we didn't sign up for that" and yet that's the possibility that's being envisaged. How do you cope with that situation? So the sooner we start to have these conversations between the customers, companies and regulators, the better.

ROB GELL: What can we learn from overseas? Surely we're not the only country in the world that's facing this problem? Are there learnings in Germany or elsewhere in the EU, the UK?

LUCY CARTER: This is a global problem and we speak to people, when we can, from a range of different markets. We're hearing US markets saying that they've got exactly the same problem. Germany is obviously having massive issues. The UK's got a slightly different problem in that they haven't built enough capacity for some of their markets and they're now having to scramble to catch up on the power stations. But this core issue of distributed energy and the possibility of people generating their own power and these networks having to compete now with another source of energy is a global problem. However, the economics are fundamentally similar in most countries and we're still in a situation where most countries haven't really crossed that threshold where it's economically viable.

Now, an interesting exception to this might be in some developing countries where you have a situation where they've got a choice here about what are they going to do: are they going to invest in putting a lot of wires in the ground and electrifying large grids; or are they going to go for a much more distributed approach to start with? In some ways it's a little bit like mobile phones: why would you install a copper network when you can just go and install mobile phone towers, if that infrastructure isn't already in place?

ROB GELL: Yes, perhaps India is doing that already with their wind network and their solar. We've got a couple of other questions here. SP AusNet many people will now, Singapore Power, one of our groups in the middle, they have had a little group put together two questions and we'll present one to you. So this is their collective question. They say one of the key conclusions of the report is that network utilisation is falling and may lead to questions of over-investment raising the question of potential asset write-down – so you can imagine they're concerned about this. However, there are many drivers for network investment including augmentation to meet peak demand as well as maintaining reliability and safety requirements. Whilst peak demand has flattened in recent years, new all-time record maximum demand levels have occurred on the same networks, including SP AusNet's. This suggests a continuing need for network investment to meet customer expectations, but it is acknowledged that there is uncertainty in the longer term. In the light of this dilemma, between short term need and long term uncertainty and the potential for the over-investment as identified in your report, how do you think energy policy should be developed to provide the necessary confidence to provide sustainable outcomes?

You've mentioned this issue, let's ask the direct question. What's our energy policy? Give us a couple of ideas, or is that in the next volume?

TONY WOOD: Well, part of our next piece of work – and I don't want to skip the question by saying "Come back in a couple of months" – but one of the particular issues is how do you cope with this



issue about are we fundamentally going to have a system in which increasingly we use more and more of it for less and less part of the year? Now, one of the issues obviously is to think about are there things we can do to try and move demand away from those peak times? Now obviously people are going to be not particularly impressed if the only time they can use their air conditioner is just when they need it, but there are other things that can be done across the network and we need to make sure that we start to provide, let's call it, pricing signals to ensure that people have the incentive to start to try and move some of that demand from those peak times, because that's one thing we definitely can be doing.

I think there are other issues associated with the detail of the network. It's certainly the case that if electricity consumption, for example, is reducing in the inner part of Melbourne but growing in the outer parts, it's not helped very much to say what we're going to do is charge differently because you can't take the wires and poles from the inner suburbs and take them to the outer suburbs just because that's the way the network is changing. So you are stuck with some of these costs and the question we're looking at is what has to be done about it? Because I would have complete sympathy with the argument, as I said before, that the SP AusNet or any other of the companies, this wasn't a malicious investment by which they're ripping off consumers; this was a process that was very much out there in the public domain and was well and truly understood, it's that dealing with the consequences are difficult.

And I think therefore starting with the things we've already mentioned, starting to move towards pricing that's more cost reflective will be one thing; being more active in looking at the way we forecast capital investment; they're the sort of things we have to do. I don't think there are any simple answers, but we've got to start because the concern we have and we raise in this report is that it's only going to get worse and we may as well start now.

ROB GELL: There's a question here related to the heating, ventilation and cooling industry asking what's the role of refrigerants? It's obviously concerned about increasing energy costs but perhaps can see that there's a critical role for this sector in the whole thing. Any thoughts on that in energy efficiency or does that just play to the same issue that we have?

LUCY CARTER: To some extent one of the big roles on energy efficiency here has been a very quiet role. There have been a lot of standards put in place such that when you go to Harvey Norman and you're going to look at which fridge you're going to buy, the array of fridges that are available has changed and that's just been a regulatory standard process which has been put in place. And I think some of those things have gone unrepresented in the debate a little bit because it's been a very subtle change, just gradually the overall consumption for the same service has declined. And I think that's one of the key roles here, that increasing energy efficiency in some of these appliances actually does play a big role in reducing energy consumption. And we're not saying reducing energy consumption is a bad thing. I mean, obviously it's got benefits, particularly in terms of carbon emissions if people are using less power and it's a significant plank in all this, and because renewable energy tends to get despatched to the grid first, if you reduce energy consumption the thing that gets cut off tends to be fossil fuel generation so you lower your carbon emissions. This is not a problem, but it's something that has to be managed.

ROB GELL: I take it this means we're going to meet our 5% emissions reduction target pretty easily, does it?

LUCY CARTER: Well, it's helping.

ROB GELL: Let's get started with some questions from the floor.

AUDIENCE: I understand that the days of cheap gas are numbered; I know HEL has applied for 20% price increases in New South Wales. Now, as the price of gas goes up, will more people change to electricity for heating purposes and if they do, what will be the impact?

TONY WOOD: Again, we've talked a little bit already about falling electricity demand, but one of the things that wasn't foreseen particularly well was this issue of rising gas prices. For those of you who aren't aware, basically for the first time the east coast of Australia's gas market is being physically connected by ship via LNG with the regional gas market. At that very time that's happening, high prices in Asia are driving up that demand, both because of economic growth in Asia but also because Japan has basically shut down its nuclear power stations, all 50 of them, since 2011. They've been hoping to restore them by now, but they haven't. That means they're paying something like \$18, \$19, \$20 a gigajoule for their gas wholesale where we've been paying \$4. As a result of that, we're now going to see an increase almost certainly of \$4, \$6, \$8, \$10 a gigajoule and that passes through and you've already seen companies announcing in New South Wales increases to the gas price of 20%.

Now, what that means is that the use of gas for power generation is already expensive, it's going to become less likely. And that's a bit unusual in the world because some of you may be aware that in the United States they've almost flooded the market with relatively cheap gas and they've seen their emissions come down and a shift from coal to gas, but in Australia the dynamic is quite different. So I think you're right, I think those companies and individuals – but mostly companies – who might have seen a shift towards gas for power or for companies who have gas for co-generation and tri-generation in their facilities to reduce their load on the electricity network won't do that anymore. They'll effectively stay with coal as a result of this increasing price of gas and once you go from gas wholesale prices of \$4 a gigajoule to \$6 or \$8 then those economics fundamentally change in the way you described.

ROB GELL: Will those prices stay that high?

TONY WOOD: I think it's a matter of how long. The evidence would be that the Americans, the Canadians and the Africans are already eyeing exactly the same market in Asia that our LNG producers have seen and they're rapidly looking to build facilities to access that market. Now, that'll take a couple of years before those facilities can truly compete. Not surprisingly, the Japanese, the Chinese and the Koreans are applauding from the field to please get these facilities on-board so they can get some real competition against those bloody Australians, but it's going to take a couple of years before we see that. And you will see in the media therefore two quite different arguments. One is, isn't this terrible that we're going to see increased gas prices for us consumers in Australia? But, at the same time, you're going to see the big producers saying "Isn't it terrible that we're going to have trouble because of high labour cost competing with those competitors in other parts of the world?" So it really is becoming a very complex world in that regard.

AUDIENCE: Firstly, thanks for the presentation. I just had a quick question about electric vehicles and the extent to which home charging will deal with some of the problems that we've spoken about, in particular with demand and the death spiral? Or whether it's likely to cause just another problem at a different time of the day and whether you've done any work in that space?

LUCY CARTER: You're right, electric vehicles are a big one here and they're a game-changer fundamentally. The question is when, if that happens, and that timing is absolutely critical, because if we see that happen quite quickly, as in the take-up starts quite quickly and it's consistent growth, then

you see everyone looks at this problem and says “Oh, okay, that’s that falling demand problem solved”. One of the things we’re thinking about in this is how, if you’re looking at tariff redesigns, you design tariffs which aren’t appliance-specific. So we’ve outlined that there are some issues with air conditioners and there are some issues with solar. This isn’t about punishing people with air conditioners, punishing people with solar; it’s about designing tariffs so that people pay in a way that’s going to reflect the services that they’re using through the network.

Electric vehicles fundamentally dramatically increase power consumption but if they don’t come in for ten years we’ve still got a big problem to solve, and if they do this is sort of a no regrets policy in that respect. Interesting point there as well around – Tony made the point before in response to the question from SP AusNet about what can we do to solve this. And one of the points that you can add to that is that in some ways with some of these network issues we need to think more short term, because the solution has always been “Build more infrastructure. The infrastructure may be in place for 40 years, but it doesn’t matter because power consumption is growing and if it continues to grow don’t worry, we’ll need it eventually”.

Now if you’re dealing with a situation where you have current growth that means you need to augment infrastructure but you don’t necessarily think that will be required in the long term, there’s going to be a turnaround, there’s a question about do you think of a more short term solution for supplying power? And in some ways things like electric vehicle fleets may be an interesting way that you can integrate in with that because you could say okay, are we going to put a charging facility in here or could we put a charging facility in some area that has localised peaks and then you can feed back into the network to cover those peaks? And I think this crossover between the electricity industry and the auto industry hasn’t been that great in the past, but I think some of these convergent processes are a really interesting way to start dealing with some of these issues.

AUDIENCE: I’d like to know what industries’ role will be to actually increase energy consumption or maybe encourage things like energy-intensive manufacturing, say, a mill for steel production?

TONY WOOD: So what the energy will be doing to turn things around you’re suggesting, in terms of increasing electricity consumption? There have been some fundamental changes in our economy, we’ve become less energy-intensive, less electricity-intensive, and I think that’s going to continue. I don’t think it’s per se a good thing or a bad thing; it reflects a whole lot of complicated issues to do with supply and demand. One thing you can be sure of, it’s not going to change any time soon and the energy companies will still be pricing their product on the basis of the fundamentals of the energy supply system, and whether you have carbon pricing in there or no carbon pricing, that’s going to be a big deal. And I would suggest the biggest uncertainty for investment in the energy sector is the uncertainty around climate change policy.

AUDIENCE: You’ve talked about obviously this really important tension between getting distributor generation out there and how that’s impacting the network because costs are falling. I’m curious because I know that there are some places, in America for example and all over the world, that have done a really good job of integrating distributor generation in their own businesses as a way of sort of saying “Oh well, we’re losing money on the network but we can start to make it back by providing other services or by integrating them into our business, by selling battery storage or we’re putting batteries on the grid”. But I don’t think we’ve seen that much of that here in Australia and I’m wondering why you think that is and if there is scope for that in our market, if that could happen here?

TONY WOOD: I think part of the answer to that is watch this space because I think to some extent what we've been seeing so far is the companies blinded by the light, if you like, and saying "Okay, what we've got to do is protect our investment". On the other hand, I think what you are going to see, and I think there are some signs of this already, that the companies who do manage these networks are asking themselves the question "What's the role of our part of the business? Is it just to have wires and poles and make sure the electricity flows, or do we have a different role to play in adding value to the network?" and does that mean that those network companies should be doing what you described in Australia? I think it's early days yet but from what I'm hearing from the companies concerned, they are very much fundamentally questioning what they do. And in some ways it's the old adage: those who can see the future first, in some cases even destroy their current business model to get there faster, are more likely to be the winners. But destructive capitalism can be a pretty unpleasant process in the short term so it could be a while before we see it increasing, but I can definitely say that it's on the horizon.

AUDIENCE: It was interesting the previous question, I was wondering if we could reframe this and stop calling it a problem? I would have thought that the concept of distributed power, unlocking a vast array of consumer surplus that's available both in the treatment of carbon emissions, localised integrity of supply, the only problem we've got is we've just got some sunk investment and what we risk is that sunk investment preventing new investment in the future. And I would have thought, as economists and as the Grattan Institute, it really is just about making sure that the conversation is correct. We need to write off this investment in the past and make sure that the net present value of the future investment maximises consumer surplus, and I was wondering how you thought about that?

LUCY CARTER: I understand your point that we may need to write off some value in these assets, and if you get to a point where people are disconnecting because these assets just aren't competitive well, what are you going to do? But it doesn't get to the fundamental problem here, which is who pays for that? And is it just a question of the networks pay for it? Because the argument about oh well, investment risk and future investment risk in Australia gets bandied around a lot but, fundamentally, if you have this contract that's written on the basis that here are the National Electricity Rules and this is how they work and this is the return that you earn for this type of investment, and then the Australian government just comes over the top of that and says "Oh sorry guys, you're going to be losing that money" that's a big question.

And it's also a very difficult question because some of these organisations are privately owned, as in Victoria, but then you get to New South Wales and Queensland and there is no private ownership to write off here, they're publically owned assets. So people pay for it through their power bills or they pay for it through their taxes effectively, and there's no way around that. I guess what we're saying is that eventually, if you get to a situation where this comes to a head and you keep investing this money, the first rule is to try and minimise the harm. So stop building excess assets; find better ways of doing it; find better ways of charging people; and then you sort of come to the point of at what point do you say that you're going to write these assets off? And if you have to do that, we may need to do that, but there's going to be a very difficult conversation about who pays for it.

AUDIENCE: Going back to investment, if you look at the mandated RETs that are coming through again, what's going to happen with prices when, say, a wind farm needs to be set up somewhere far away from the city and then what's going to happen is that the transmission guys are going to have to lay more lines in; does that mean that we're going to prices going up because new transmission needs to be put in to get electricity from the new renewable energy sectors, I guess?

LUCY CARTER: Yes, in short and it's one of the issues that goes into the economic viability of renewables and particularly live-scale renewables. And I know it's certainly one of the issues that groups like the Australian Renewable Agency are looking at around, if there's going to be government investment in renewables could part of that be looking at issues like how do we actually get the transmission infrastructure in place? And who pays for that infrastructure? Do you take a speculative bet that everyone's going to have to pay for a commercial project that's going to be put on the end of the line?

AUDIENCE: In relation to the transmission and distribution costs and the Essential Services Commission's rulings on that recently, how much of the transmission and distribution should be put into the fixed charge component and how much should be added on to the marginal cost of the actual production of electricity, given that if a large portion is put on the fixed charge, those in villa units and apartments may start disconnecting earlier than they otherwise would?

TONY WOOD: I guess that's what I said before, that one core of the issue is to ensure that tariffs are more cost effective and in going from where we are now to a different system, you don't want to destroy everything in the process, like the baby with the bathwater type thing. So it isn't just saying what would be the appropriate answer, but how do you get there from here? So one of the things we were looking at in our work is to say not only what might be a better way of charging for this network and charging for those fixed assets you've talked about, because largely once the asset is built the cost is fixed and it doesn't matter how much electricity you put through the wretched thing; but also how would you get there from where you are? So the implementation of new policy and new regulation turns out to be equally important, at least in the short term, to designing what the right answer is and I think that very issue is going to be fundamental to how the conversation develops from here.

AUDIENCE: I'm just wondering if we could go back to the first graph because even though I think this is a great paper and we've been strongly advocating for tariff reform for quite a long time because, as you say, it's not very cost-reflective, but I also think we do need to think about two separate components which is cost-reflective for past installations isn't actually really cost-reflect; what you need to do is get price signals right for future investment, but also work out how you equitably deal with that previous investment that is, to a certain extent, sunk. Is there any way to go back to that first slide because I would just like to mention that even though the decline in demand is an important issue, we do need to think much more about total energy bills. The idea that you would only really think about the "per unit" component kind of goes back to that thinking that got us into the problem in the first place which was that demand was relatively inelastic, people don't change their demand much over time. So actually, their "per unit" cost – I just did some calculations then based on some great data from Sandiford which was the problem in a way isn't that our demand has dropped, but our demand has dropped well below what we projected it would be despite the fact that it was out of projections for about five years before people started reframing them. So demand now below where we were projected to be is 20%.

If you think about that as the fixed costs components, the networks and the transmission and distribution, let's say you've got that 20% maximum, let's say that increases that component, which is 50% of household's electricity charge, by 20%. You're talking about roughly a 2c maximum increase, then you actually take away the reduction in the wholesale price, it would be substantially less than that. So you're talking about somewhere between a 1.5c difference. That's in the "per unit" cost, but the fact is that if every household is using less energy, that actually doesn't make any difference to their bills. Their bills should be exactly the same. If everybody reduces their energy use by 20%, there



is no difference in any of the bills. It does matter when people come off because then you've got one big customer.

So I suppose what I'd throw back is in a way we keep on focusing on the "per unit" cost and in a world where people actually can deliver their energy services with varying amounts of energy, that's actually a not really very useful metric at all. So is it better to focus on total bill size and how do you feel about that idea of the tariff reform debate being a bit of a how do we deal equitably with previous investments and how do we get efficient price signals forward?

TONY WOOD: Firstly, I didn't make a note of all those numbers so I wouldn't attempt to review them all. But fundamentally the issue is are we getting what we need from energy, be that lighting, be that heating, whatever, and how much we pay for that in total is the key issue. I agree with you completely that to some extent the unit price could be a distraction. The reality is at the moment most of the networks charges and most of the power charges are based upon a unit price, so the sooner we start to re-adjust these things towards something which is more cost reflective is the answer. And in the process, what we don't want to do obviously is have a significant social equity issue because we already know that people on low incomes spend more of their total income on things like electricity and gas. Making that worse would not be a good idea. So the trick there is to say okay, what is a more efficient way to price and then if there are any potential social equity issues that arise out of that you can't go the other way around, and that's why it's important that organisations like [ACOSS](#) and so forth are part of the conversation.

AUDIENCE: That's a useful segue to my question which is about social equity. You talked about households who will opt off the network and it seems to my mind it's the capially constrained households that won't be able to do that and Lucy said, quite facetiously, you might have three of you left paying \$1billion each. My concern is it's going to be the vulnerable in the community that are left connected to the grid; the renters; the ones that are unable to get off. In talking about that need for asset write downs and who's paying the costs of that, I guess I'm interested in where's the debate about the social equity in that? And if it is going to be consumers that are left paying that, then that seems to be entirely regressive, they're going to be paying a double whammy because it's going to be the most vulnerable paying that. Isn't it much more socially equitable for governments to pay that through the taxation system or preferably perhaps the networks paying it where they can?

LUCY CARTER: Yes, I will just make the point that we're definitely looking at this as one of the issues of how you restructure tariffs. And one of the ideas that you see around network costs is you say "Oh well, it's a fixed cost, everyone should just play a flat fixed cost" but what you end up with in that situation is things where people have got a big house, air conditioner, pool pump, all of that sort of stuff, end up paying the same price as people who are living in much more humble surrounds. And it's one of the many factors that go into how you design a pricing system.

There's sort of two issues you raised: one is around tariff design and absolutely, in the context of the work we're doing at the moment it's one of the factors that go into the mix and it's an important factor and we're definitely speaking to people from agencies who can give us some specific advice on those particular issues; and the other one is how you pay for the costs of network write downs. I don't think there's likely to be a situation where paying for write downs specifically targets low income groups. I think there's already a situation where those low income groups are implicitly paying for things like air conditioners and solar panels and things like that where they're not necessarily in a position to buy an air conditioner or they're renting or they don't have any upfront capital to install a solar system.

ROB GELL: Tony, two-and-a-half minutes to summarise.

TONY WOOD: I think one of the first things that we need to learn from this whole exercise is that to some extent we don't want to just degenerate into a blame game in terms of whose fault is this. A lot of it arose from the fact that in the 1990s we privatised and introduced competition. In particular in Victoria, there have been significant benefits as a result of that process. There were some things that were left undone and one of them was to leave electricity network pricing based more or less on a variable basis, but that wasn't, as Lucy said, a big deal. It's now a big deal. So how we start to engage in an adult way and having that conversation about difficulty policy consequences, about an issue that I'm sure you've already gathered actually becomes very quickly very detailed and only the sort of people who get off on policy nerd stuff really can survive the process, it becomes a challenge because this is something that concerns all of us. I mean, some of the things you hear about immediately just don't sound right, some of the things we've been talking about, and yet as soon as you peel away the top layer you're getting involved in the sort of detail we've been talking about.

So how do we engage not just the network companies, the generators, the regulators and the operators of the network, but also those who represent large consumers and also small consumers and disadvantaged in this community is going to be one of the really big challenges of this. We think the first thing you do is to stop digging ourselves into a deeper hole and fundamentally have a look at what we need to start to move towards, thinking about the implementation challenges and how we go from there. The next piece of work we're doing is to have a look at exactly what those solutions might look like, test those with what's been done in other parts of the world in this sort of space, as Rob implied, some people have tried different alternatives both overseas and in Australia. Secondly, test those with the various groups we've just mentioned in terms of what might be the practical implications to changing the way we charge the networks. And thirdly, think about okay, if we think there is a good solution how might that be implemented? That's the sort of thing we're working on now and that'll be the subject of a further seminar just like this.

So my task, I guess the final thing I want to do is firstly, thank Rob Gell. Rob, for those of you who know what a Geomorphologist is, that's what he is, one of those, but Rob has done many, many other things in his career than from where he started. Many of you will know Rob most as being a weather girl for a couple of television stations, but Rob's role in recent times has been probably one of the more active participants in a whole range of issues to do with some of the environmental challenges that in our modern society we're chasing. And I think we're very grateful, and certainly we are as Grattan and hopefully you have benefited also by having Rob here to expose some of the issues we've been discussing. Can I first of all ask you to join me in thanking Rob.

I'd also like to thank the Library. As Lucy said at the beginning, we have a relationship with the Library now which will result in one of these seminars about every month from Grattan. They won't certainly be all energy but you'll see some of those emerging as the year progresses and I'd urge you to keep checking on the Grattan website, and those of you who have signed up will get emails from us advising you about those particular activities. In addition, the Energy Program at Grattan also has a very strong partnership with the Melbourne Energy Institute and will be running not only an exercise or event next Thursday on the challenges of storage, and we did touch upon the issues of electricity storage this evening, but that'll be an in-depth discussion around some of the elements of what it means for electricity consumption and demand in the future in terms of storage. And so we'd certainly urge you to think about joining us for some of those public seminars and discussions because what we're trying to do as Grattan is to encourage a broader public engagement on what are often very difficult issues, but we are all seeing some of the consequences of those issue.

And finally, I'd just like to thank you, the audience, for coming together. The room is almost full, as I'm sure you may have seen. Thank you for coming down the front those of you who did when we began because that made more room for the back. Thank you for coming out tonight and hopefully you've gained a little bit of an insight into the somewhat arcane world of network regulation and what we do about falling electricity demand. Thank you.

END OF RECORDING