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12th Assembly

Committee on the Northern Territory's Energy Future

Private Briefing Transcript

9.00 am – 11.00 am, Friday, 20 February 2015

Litchfield Room, Level 3, Parliament House

Members: Hon Gary Higgins, MLA, Chair, Member for Daly
Mr Gerry Wood, MLA, Deputy Chair, Member for Nelson
Mr Gerry McCarthy, MLA, Member for Barkly
Ms Nicole Manison, MLA, Member for Wanguri

Apologies: Mr Francis Kurrupuwu, MLA, Member for Arafura
Mr Matthew Conlan, MLA, Member for Greateorex

Power and Water Corporation

Witnesses: Mr John Baskerville: Chief Executive
Mr Trevor Horman: Manager Sustainable Energy
Mr Paul Ascione: Chief Engineer Power Networks
Ms Djuna Pollard: Senior Executive Manager Strategy, Economics and Regulation
Mr David Murphy: Senior Manager Economics and Regulation
Ms Lucy Moon: Manager Economic Reform
Mr Kambiz Vessali: Senior Manager Metering Services

CHAIRMAN: If we are all ready, we'll get the formalities over and done with.

On behalf of the committee I welcome from Power and Water Corporation, I won't go through the titles; John Baskerville, Trevor Horman, Paul Ascione, David Murphy, Lucy Moon, Djuna Pollard and Kambiz Vessali – I hope I got that right?

Mr Kambiz Vessali: Yes.

CHAIRMAN: Now while this is not a formal public hearing, it is still a formal proceeding of the committee and the protection of parliamentary privilege and obligations not to mislead the committee apply. A transcript will be made for use of the committee and may be put on the committee's website.

John, would you like to make any opening comments? It is going to be reasonably casual, this morning.

Mr John Baskerville: Yes I have got a few pages, just to set the scene; and bear with me I have got the dreaded lurgy.

I attend today in my role as Chief Executive – Power and Water Corporation; thanks for inviting Power and Water Corporation to appear before the Committee on the Northern Territory's Energy Future to further discuss the very important aspect of electricity pricing.

From the hearing on the 28 November 2014, it seemed that the committee may value further dialogue on matters such as: peak demand as a cost driver, cost reflective pricing, cost building on accounts, solar PV issues, results of the Alice Springs Solar City project, functionality of various types of meters and metering as a facilitator to implement cost reflectivity.

I would like to first introduce my colleagues, who have a wealth of experience and knowledge about all these things, and I will hand over to them in due course; Djuna Pollard, Senior Executive Manager Strategy, Economics and Regulation; Trevor Horman, Manager Sustainable Energy; Paul Ascione, Chief Engineer Power Networks.

There are a number of topics my colleagues and I would like to touch on today, in order to assist the committee in their deliberations. Power and Water is uniquely placed to provide comment given our advantageous position of having been vertically integrated across the entire electricity supply chain just eight months ago.

I would like to start by explaining the network impacts of peak demand; system peak is a maximum demand of electricity for the Darwin-Katherine system that occurs maybe once or twice every wet season. It occurs particularly when it is hot and humid outside and everyone comes home late in the afternoon and turns all their appliances on; the air-conditioning, lights, down-lights, and plugging in their mobile devices and TV's and computers and stove tops and on goes a load of washing. When everyone does this all at once, there is an instantaneous demand for electricity which we have to transport through our electricity network, and similarly the air-conditioning layout in commercial buildings in the CBD adds significantly to the day time peak loads on the power system.

For most of the year the demand for electricity is pretty stable, and our load profile is probably the envy of many other distribution businesses across the country. However, we must build our network to handle our peak even though it operates at a peak only a few times a year. Having to design and maintain a network for that peak in these weather conditions means that the cost of transporting electricity from A to B in the Darwin/ Katherine grid is very expensive. What pricing signals can do is demonstrate to the end-use customer what the cost of coming home and turning everything on at once, really is. That is, what is the cost of the peaks.

The problem we and most likely all other network providers face, is ensuring the end-use customer faces these costs signals, understands them and is able to respond to them by adjusting their demand. There are some, the 'early adopters' we call them, who monitor their electricity usage and only turn on the dishwasher at night when they are going to bed. These customers would benefit from a time-of-use tariff which Jacana is looking at. But other customers find the current price structure is easier to understand.

The network service provider is in a unique and unenviable position, in that it is restricted in its ability to engage with its end-user customer to develop a relationship that can drive beneficial outcomes for both parties, as in higher standards and lower prices. It is the end-user customer that drives our demand, but our network prices only go to the electricity retailers, so we can send all the pricing signals we like but if you don't get them to the right person then we have no way of influencing the customer behaviour. The challenge, therefore, for this committee and something I know many industry bodies and regulators are grappling with at the moment, is how the network

provider and retailers can work together to reflect the true cost of electricity demand to the end-use customer without imposing overly complex pricing regimes on the mums and dads.

One answer we do have to this problem, like many of our counterparts, is metering, more specifically interval meters and in-house displays that allow consumers to see how much their consumption increases when they turn on their air-conditioner and down-lights etc. While metering isn't the answer to all our problems it is an enabler and it does start that conversation with the customer, by starting to educate them about the energy use. This in turn can reduce the impact on the network, lower peak demands, defer capital investment and help to put the lid on network price increases. The Alice Springs Solar City project provided some insight of customers modifying their behaviour for their mutual benefits. I will call on the team to come and show you the different types of meters we have installed across the Territory and what each of them can do; so we have got some displays there.

Another issue network providers are facing across the country is the devices being installed in homes that are placing new pressures on our networks, which we never faced before and which certainly weren't contemplated when much of the network infrastructure was built 40 years ago. In the average home today there is multiple high definition TV's, each child has a mobile phone, a computer, an iPad, iPod and all of these even the fridge isn't just a fridge anymore with the electronic displays it can make ice and cold water for you. And in the Territory most rooms have air-conditioners, and most homes have a spare fridge or two and a pool or a spa. Many of these devices impose demands on the electricity system that were never there 40 or even 10 years ago in some instances.

The quality of electricity, that is the frequency and the duration of the supply, has to be much more refined to keep within much tighter limits than ever before and that has its own costs for the network. Air-conditioning alone imposes costs on the network. It has been estimated by the Electricity Supply Association of Australia that for every 1 Kilowatt (kW) of air-conditioner load added to the network, an additional investment around \$2500 is required. That is more than the cost of the air-conditioner itself. Now I know this quote has been bandied around a lot, but I do think this is very useful illustration of what we are dealing with here.

Solar PV systems represent one of the greatest pressures on the electricity network by introducing voltage rise issues, and sharing the network costs of non-compliance issues. Much of what system control does, another function that Power and Water does at the moment, is manage what electricity is put into the network by generators in order to balance what has been drawn out, or demanded by the customer. What PV systems are doing to the Darwin/Katherine grid is adding essentially the equivalent of one additional generation unit to the network based on an installed PV system capacity of 13 Megawatt (MW)). System control has no ability to control this intermittent source and cannot see the scale of the generation. In certain areas of the network a large number of PV systems can lead to real physical problems and I will let Paul later on explain to you a bit about that.

It is also important to remember that the current network tariff arrangements are designed for the transmission of energy from power stations to sub stations and distributed on to the householder and businesses. This cost is then bundled up averaged and passed on to the mums and dads through their retail bills. Unfortunately, the network tariff in the Territory and almost all other jurisdictions haven't kept pace with the uptake of PV systems: reducing consumption and even exporting energy into the same network. Today we have an increasing number of PV owners reducing their consumption of electricity from the network. Due to the current electricity network pricing framework, this means these customers are not making the same contribution to the cost of the electricity network as those without PV systems. This is a hot topic in the national electricity market. A possible solution could be to introduce a PV class of customers for network tariffs. It is time pricing options are discussed and we commend the committee for providing this forum for further discussion. It is now overdue and we must move to cost reflective pricing so that electricity prices are transparent and reflect the real cost of providing the service. Not only will cost reflectivity provide a better pricing model, it would also put some capacity in the hands of the customer to make choices around their behaviours and manage their electricity accounts. Thank you.

Mr Gerry WOOD: Mr Chair, could I ask just one question?

CHAIRMAN: Yes.

Mr Gerry WOOD: Mr Baskerville, I know we are having a private meeting here today but can that statement be made public?

Mr John Baskerville: Yes

Mr Gerry WOOD: That's alright, because it is a private meeting.

CHAIRMAN: I thought one of the things we might do is when we get the full transcript is actually ask if you could go through it and mark out stuff that you don't want made public. So that would be the best way for us to do it, I think.

Mr Gerry WOOD: Yes, I just asked because that was a separate statement.

CHAIRMAN: Now, I think the way we might do it this morning, I know you have a sequence that you would like to work through, so I think if we are all happy enough to follow that and then we will ask questions as we go along, is probably the best way but I would rather have it a bit interactive, is that the word?

Mr John Baskerville: We were going to run through the first cab-off-the-rank and that was peak demand and cost drivers, which Trevor and Paul will run through.

Mr Trevor Horman: I thought it might be helpful to start to give you some feel for what we are talking about here; this is 365 days of the year showing how the load varies. This is wet season in the middle here and the ups and downs are the weekend, so the weekend has lower consumption than during the weekdays. But you can see there is a seasonal peak that happens – we get the peaks in November and sometimes in March each year. So when you look at it from a daily basis, this is a daily curve – and the red one here is the peak day of a wet season day and then there are other days that are low, they must be cloudy days when the air-conditioner is not running so hard.

But what it proves is that we have got to provide all infrastructure to cater with this situation and it's only a couple of days a year, a couple of hours a year, so the investment is all there to cope with that situation. So the challenge for us is to mitigate that peak somehow so we don't have to keep investing and investing, and that is what the industry has done for the last 100 years. It's been supply-side chasing rather than demand-side managing. From the local customer perspective, this is a daily consumption curve and what we talk about with consumption is the energy that has been used during that daily period, the peak demand is what they imposed on the network at the peak time of the day. So I think an analogy sometimes used is it is like your car – you drive along and the throttle controls how much of the engine's power that you use, but at the end of the week it is how much fuel you put through the car that is the energy. So we are very keen to distinguish between consumption and energy, demand is the problem!

Grattan Institute have been through the same sort of thing, it's a national issue we are not the only ones that deal with it but I think we are a bit special in that air-conditioning is such a dominant part of our load and air-conditioning is a controllable load, so we have got some options there. So like John just quoted, what we can do is demand management and there are a number of things that you can do, sorry about this, but I should go on...

CHAIRMAN – Hon. Gary HIGGINS: No, you're right.

Mr Trevor Horman: You can shift load to off-peak times. One example of how this is done is the use of thermal storage associated with air-conditioning. So what it got down to was they put a 13 Megalitre (ML) tank there of chilled water and all night the chillers run and they take that water down to 1° and then the chillers turn off during the day, and they just use the chilled water during the day. So it is thermal storage and they've got a \$1m or more off their bill. We are happy because it shift loads to another time of the day, we negotiated a contract, they wanted to get a four year payback period, they got it and now they keep ringing up and saying: "I found another 100 kW that I have moved from day time to night time. So that can be done, load shifting can be done. You need to have a reward system in it so that there are winners on both sides, but it can be done.

The second one is change the behaviour process. There is an ice-works in Darwin where...to start off the owner wanted to put PV on his roof and we looked at his load and we said; "mate, you have only got a very low load, what's the deal?" And he had a time-of-use tariff so he is making all the ice at night time, so he got the message he was better off if he did it at night time. But you can change a business process, if you wanted to put a lot of PV on the roof it would shift his business to do ice during the day.

Another one we found was a quarry north of Alice Springs. We went to them and asked them; "why are you guys working out here in the hot sun, crushing these rocks. You would be better off to do it in another time of the year". And I couldn't believe their reaction, they said; "this plant is big enough to crush all the rocks we need in three months in the year, so we will happily move to do it in winter time". It was only a conversation; they didn't need much more encouragement. So businesses might say they don't have the capacity, but when they think about it there are things that they can do about it.

More efficient technology, buildings like this have Building Management Systems in them and they are finely controlled and they look at the humidity and the temperature in the building and various zones in the building, and

whether the building is being used. So there is lots of intelligence in there, and there is now even vendors of computer programs that are called building tuning software that you can add on to your Building Management System and claim huge benefits for it all. So, technology is coming along that is helping to deal with this sort of thing.

Load control is another layer all together and that is an issue that we need to put on the table. It's coming, it's possible now, if you go to Harvey Norman and look at all the air-conditioners on the wall, they have got the star rating but they have also got a demand response rating. It means that a utility that is properly set up with communications system, if there is a problem can back-off that air-conditioner to 75% or 50% performance for 15 minutes or something like that so they don't even know. But it gives you much better control of these system peaks that we are really looking at.

Then there is stand-by generation. We believe that there is 30 MW of stand-by generation laying around Darwin in buildings like this that people are not allowed to connect to the system for safety reasons. It was a technology issue, but nowadays we will facilitate that sort of connection and that can help. There are sophisticated customers that we talk to that have looked at their demand tariff and can work out that sometimes it might actually pay them to run the stand-by generator rather than pay us the demand charge. So there are lots of options but what we have to say is that all of it has to be under-pinned by a pricing signal that encourages them and reinforces any changes that they make.

What I looked at was the installed capacity that we have got on the Darwin/Katherine system over the last five or six years; and we have looked at the revenue that comes from consumption, the investment in plant increased by 5% a year on average and the revenue or the consumption increased by 1% a year. So it is not a very good business model to be in. So there is a big incentive to deal with that peak demand and just knock that off and it's a national problem.

Mr Paul Ascione: That's right, it is a national problem and right now we're probably one of the few places that are growing, so it is still a bigger problem for us than it is down south where demand is actually dropping at the moment. But you hear a lot about gold plating the networks, particularly around NSW and QLD at the moment and that is due to they predicted a lot higher load growth than actually was achieved, they may have spent a lot of money on their networks that was unwarranted in the end. So there is very much a drive by the regulators, for all our capital programs now for the need to analyse demand management options before we get approval to spend money on upgrading our network or extending the network. So it's a major driver. Every dollar we invest in capital we get a return on that across the mainstream and that is the big talking point at the moment is the return on those assets and trying to reduce that as much as possible and keep our tariffs down.

Mr Gerry McCARTHY: Where does the 5% go then? If you are looking at 5% per annum on the Darwin/Katherine network, where is the investment?

Mr Trevor Horman: This is in Generation and Transmission systems like Johns' mention of the \$2500 a kW. That is roughly \$1m a MW to be put into Generation, another \$1m into Networks and another \$.5m into the rest of the system. So that is broadly where it comes from and leads to, so it is right across the system because this peak demand drives how much generation plant you have got to have and how tough the network is.

Mr Gerry McCARTHY: So if we are not gold plating the network, are we upgrading the network because it's 40 years old?

Mr Paul Ascione: Bit of both.

Mr John Baskerville: Yes, a bit of both.

Mr Paul Ascione: At the moment, I am sure you are aware of the Casuarina incident back in 2008 that identified that a lot of our zone substations were end-of-life so there has been a very significant investment in replacing those zone sub stations, and that will continue for the next 4 years. But certainly we are growing, particularly around the Palmerston area, the new suburbs there has resulted in a new zone substation of Archer Zone Substation having to be built. So it's both a mixture of growth and replacement.

Mr John Baskerville: Gerry, one of the things we, as Paul says, all zone sub stations have been collectively upgraded, we have got a couple on the go again now – one out at McMinns the old 22-mile and Casuarina is coming up and Tennant Creek we have done a big job down there, to put the switchyard indoors. The other thing that has got to happen now is, we've concentrated on all the big stuff, all the zone sub stations, it's in-between, it hasn't been touched. As much as we want to and we have got programs and plans to upgrade what's in between.

Mr Gerry McCARTHY: Is there new technology around that? If I think about 40 year old copper running between poles, is that all new technology now that we should be investing in?

Mr Paul Ascione: Certainly, we are using the latest technology when building these zone sub stations, so a lot of fibre type communications; for example, instead of copper wiring. In the zone sub stations they're all gas switch gear which is the latest and greatest in terms of the gas insulation instead of having oil; which, when oil switchgear blows up it can be catastrophic and cause fires, kill people, so we use gas insulated switchgear which is highly reliable. In a couple of areas, like Casuarina now and Woolner which replaced Snell Street, we have actually got indoor 66 kV GIS which will probably have a life of 60 or 70 years; so yes, we have certainly moved to the latest technology.

In terms of our plans, they are all documented in what we call a network management plan that we publish every year. The public version should be going up either today or early next week, that has all our plans in there for our capital extension for the next five years and it also gives an indication of where we think the network is going to grow in the longer term in the 10 or 15 year type time frame. It also has all our performance statistics in there in terms of how reliability is going, how we performed in delivering our capital programs, how we have gone with our maintenance programs, so it's a very comprehensive document, it's transparent and we publish it every year and this is the third one that we will be publishing this year.

Mr Gerry McCARTHY: If you look at a new suburb, if you look at Zuccoli I would expect that is the latest technology going in underground power and what is the latest in modern urbanism, and you have got a 40 year old system feeding that, does that present problems?

Mr Paul Ascione: No. Provided that 40 year system has been maintained correctly and is reliable and we have an understanding with the condition of those assets, which we do now. We have a very robust understanding of the condition of all our major assets in the network now, that wasn't the case when Casuarina blew-up. So there has been a journey to improve our asset management in power networks particularly, and we have come a long way and we continue to improve and as long as we know the condition of those assets and when they are due for replacement, there should be no problems.

Mr John Baskerville: Yes, the blame can be on put in quality in the first place like Tennant Creek and Alice Springs; those systems have been there for 80 years and are still robust. So it is what you do upfront. If you skip up front, well you will get bitten down the track.

Mr Gerry WOOD: Will you be able to download that off the webpage easily?

CHAIRMAN: (laughter) most people will!

Mr John Baskerville: A lot easier than that thing!

Ms Nicole MANISON: I will down load it.

Ms Djuna Pollard: I can send you the link.

CHAIRMAN: Can we get a hard copy for Gerry?

Mr Gerry WOOD: That's alright

CHAIRMAN: We'll do that.

Ms Nicole MANISON: The presentation has been wonderful so far, by the way but I just wanted to ask some questions about the issues that you have raised with regards to solar panels on households. So I am just trying to get a bit of an understanding around the issue. Last time we sat down and had a bit of a chat, you were saying that for every household user that puts their power into the network, I believe there was only so much capacity that the network had to take a certain amount of solar being pumped into it, was that correct?

Mr Trevor Horman: Yes, there are constraints on how much you can put in. Every one of the solar panels is a generator, so if you have a whole street of generators it is pushing the voltage up in the street and the statutory limit is 253 Volts. That is the LV voltage limit and once you get over that new TV's and home videos and the whole deal starts to suffer and it can be in your own home, more likely in your own home, but the neighbours' home and the like. To try to control that we have brought in a cap of 4.5 kW for domestic PV systems, that offsets most of your domestic consumption and it keeps the voltage issue under control. There is a management technique for larger systems with commercial people that are looking at 100 kW and MW systems, we require them to put in

export limiters so that they only offset their own consumption and that is well accepted through the industry, they are all happy with that and the technology has come along at the right time.

Ms Nicole MANISON: Are you monitoring, I imagine you are, keeping a very close eye on the installation of solar systems on to people's roofs. Because I've got to say, I look around my electorate and within Leanyer they just seem to be going up left, right and centre. Within the new suburbs people seem pretty keen to go there. I mean, what has the rate of uptake been and how is that impacting things at Power and Water?

Mr Trevor Horman: It started off in 2009. In 2009 we were running one system a year in the Territory and that year it took off to 500 and it has been like that ever since. We are well over 4000 systems now right throughout the Territory, so you've put your finger on it. But in terms of quality of systems, there are good installers out there and there are some not so good.

Ms Nicole MANISON: Ok.

Mr Trevor Horman: For instance, we require them to put the inverter in and set the voltage limits at 254 and 216 Volts, which are the upper and lower limits. But an audit we did recently showed that very few of them had been set, so they pull them out of the box, screw them on the wall, and potentially run that risk of running to high a voltage. So yes, there is a need for more of that. In terms of safety, WorkSafe is the agency that looks after the safety of installation.

Ms Nicole MANISON: And with this discussion you feel that is needed on the pricing of feed-in tariffs and how that all works with the moment, is that something that Power and Water would control that discussion, or is that something where Jacana Energy would be?

Mr Trevor Horman s: You had better ask Djuna to comment on that.

Ms Djuna Pollards: So it's probably a combination of ourselves, given I guess the technical expertise element around that and Jacana as retailer, or the predominant retailer and also the energy directorate within the Department of Mines and Energy. It is probably timely that that feed-in tariff policy is looked at, because initially it was a Power and Water initiated policy and it's been in place for quite some time now. More broadly across Australia, other utilities and Governments have looked at their feed-in tariff policies and some of them were quite generous feed-in-tariff arrangements offering anywhere between 40c – 80c a kWh. And more recently there has been a scaling back of that and I think currently the range is sort of sitting at around between 6c – 13c a kWh, so there has been quite a reduction there.

Ms Nicole MANISON: And what is it here in the Territory at the moment? Is it a one for one?

Ms Djuna Pollard: It's a one for one, so essentially at the moment that is sitting at around 26.8c a kWh...

Ms Nicole MANISON: Ok, that puts it in a bit more perspective.

Ms Djuna Pollard: ...for the residential customers.

Ms Nicole MANISON: Ok, thanks Djuna.

Mr Gerry McCARTHY: In that commercial example of limiting power production, what do they do, dump it?

Mr Trevor Horman: No it's like taking your foot off the pedal on your car, the inverter just ramps it back and the export limiter, that is actually just a measuring device at the front gate that measures if there is anything going out and if it starts to go out it just takes the foot off the pedal. So no, it just doesn't get produced. The solar panels work on a system with the maximum power point tracker that optimises their performance and it just backs off the power point tracker a bit so that it doesn't produce so much.

Mr Gerry McCARTHY: Alright. So will that sort of technology need to be applied to the household user, essentially if we keep going down this road?

Mr Trevor Horman: Yes, it's an option. At this stage it's a reasonable component of the cost of inverters that they add on, so it is very applicable to the SME and larger systems but yes, you could get to a situation. What we are looking at in the future is storage is becoming very attractive and a few of the vendors are trying to push storage, and honestly it's expensive immature technology and I wouldn't push it too hard, but when they get to that stage what they will want to do is put very large PV systems on their roofs and not only supply their own need, but store

it in the battery during the day and then use the battery during the night. So that is the sort of technology disruption that we are contemplating for the future.

Mr Gerry McCARTHY: Well I was using storage in 1989 in the Nicholson River and so storage must have come a long way since then; those batteries were like this high and that wide and there was a bank of them like you wouldn't believe.

Mr Trevor Horman: If you go into the Telstra Exchange you will find a similar sort of thing going on, but Lithium ion phosphate technology is coming along; still very expensive but does have higher energy density so you can get it smaller. But the Boeing Dreamliner was an example where those batteries just didn't stack up.

Mr John Baskerville: Yes, Nicholson River they used to be BP batteries.

Mr Gerry McCARTHY: Really?

Mr John Baskerville: Yes BP, apparently.

Mr Gerry WOOD: Can I ask, if there is so many people putting solar on, and when I went to Europe I heard that some villages actually work together and have one solar array for the entire village. Is that something that is feasible in some of our newer suburbs? So in the design of a suburb, an area could be set aside for a solar array for everyone to connect into in the suburb.

Mr Trevor Horman: Yes, there are several answers. Basically in Alice Springs in the Solar Cities Project, we identified that 35% of the people in Alice Springs were renters, so they didn't really have the option of installing PV. So we built the Uterne Solar Farm down the road and you can buy it from that but we didn't get a very big uptake. We are now into a \$55m project out in the remote communities where that will basically be the model; you put in a central solar farm, it does work and it integrates with the power system and you really do have to do it out there. So there is horses for courses, some people like to do it on their own roofs but, it is a good idea to centralise it if you can.

Mr Gerry WOOD: And you could have control over that, I would imagine.

Mr Trevor Horman: Absolutely, that is the good thing.

Mr Gerry WOOD: Which you don't have at the moment.

Mr Trevor Horman: No.

Mr Gerry WOOD: Can I just ask another question? In your statement you talked about how you got that disconnect between yourselves and the end-user, the meter belongs to whom?

Mr John Baskerville: Network.

Mr Gerry WOOD: Network, so you have got you over here passing the power to the meter, but the people who actually charge the people is the retail? So once upon a time you were all Power and Water and then the Government decided to split you into three GOC's, a lot of people say that it's a great thing and I am not saying it is or it isn't, but is that one of the disadvantages of being split that you don't now have that free-flow of communication between the retailer and yourselves, or is that not a problem?

Mr John Baskerville: No it hasn't been a problem so far Gerry, it has worked pretty well actually.

Mr Gerry WOOD: But when you said you had a disconnect, I didn't know whether that was what you meant. Is it a disconnect that is not a problem, or just...

Mr John Baskerville: No not between the two GOC's, no.

Ms Djuna Pollard: It's more a disconnect in terms of the pricing structures. So, from a networks perspective we could come up with cost reflective tariffs that could be split across demand and the energy components. But if the retailer is only charging their customer based on an energy component then that is where the disconnect can be, so we can put a lot of time and effort and energy into designing appropriate tariffs structures that are going to send pricing signals to customer, but if it's not getting translated through the retailer then that is where that disconnect can occur.

Mr Gerry WOOD: So how do the two GOC's now work in relation to discussing all these issues, is there a regular contact?

Mr John Baskerville: Oh yes, we were meeting every couple of days especially in the early days, we lived in each other's pockets for the last three or four months.

Mr Gerry WOOD: But if you get say, a new retailer in the market will that necessarily happen? Because you are all Government Owned Corporations, so if we get another private retailer come in...

Mr John Baskerville: Yes, we have had a private retailer for a long time in QEnergy.

Ms Djuna Pollard: We have a central function within PWC; I guess it almost acts as a bit of a concierge if you like, for what we call our second-tier retailers. And rather than them having to deal with different people across different parts of the business, we either coordinate or put them in contact with the relevant people in the business.

Mr Gerry WOOD: Ok, thanks.

CHAIRMAN: So what's really stopping us going to different charging regimes?

Mr John Baskerville: This is, time of day?

CHAIRMAN: Yes, anything along those lines. Is it just the cost of the meters?

Mr John Baskerville: Can you answer that, time of day?

Mr Trevor Horman: Time-of-use metering certainly does require a lot of people to put different meters in and Kambiz will come to this later, but there is a cost to do that sort of thing and Jacana is the one that is working that through at the moment, it is not really our deal.

CHAIRMAN: Yes, alright.

Mr Gerry WOOD: Can I just ask then, because in last night's statement by the Minister you mentioned Nguu as having 90, I don't know what you call it they are not power cards that you put in some sort of meter so people can...

Ms Djuna Pollard: Pre-payment Meters.

Mr Gerry WOOD: Yes, is that your area, not Jacanas is it?

Mr Trevor Horman: Well, we provide the metering service.

Mr Gerry WOOD: Are you able to explain a little bit about what that trial was about? And if you know how it is working?

Mr Trevor Horman: This is the...

Ms Djuna Pollard: This would be Daly River.

Ms Lucy Moon: Daly Waters...

Mr Gerry WOOD: Nguu. The Minister mentioned in his statement last night, he didn't give much more than a comment, he called it a "highlight" but there wasn't much.

Mr Trevor Horman: Alright, well the bits I am in, we do load management trial at Daly Waters...

Mr Gerry WOOD: Daly River this was, Nguu.

Mr Trevor Horman: Daly River I mean, yes. It's a prelude to the solar set-up project down there. In the solar set-up project we are trying to get as much PV out there, as much displacement of diesel fuel as we can in 35 communities, but Daly River is an experiment in terms of High Penetration Solar. When you get High Penetration Solar you do get this intermittency effect, so this is a trial where we are looking at load management so if a cloud goes over the generation drops and drops it on the power station, we do some load management rather than shedding a load.

Mr Gerry WOOD: But my understanding from the Minister's statement; he mentioned 90-something or others...

Ms Djuna Pollard: Yes, so obviously in most of our, well all of our remote communities we have Pre-payment Meters and at the moment it is effectively like a card-based type token that our customers have to have credit loaded on to effectively, and then they put that token into their meter and that is how they get their electricity. Behind the scenes that is quite challenging for us and can be costly to administer, particularly for example if we have a tariff change and we have had Carbon introduced and then removed and tariff increases and so forth. What that actually means for our remote operations team who are dealing with the remote communities, is that they physically have to send people out to change over every single meter to load up the new or the revised tariff. And as you can imagine depending on what time of the year that occurs, it can be problematic and can take us up to three months to change all of those meters, so that is one of the challenges.

The other one is the metering technology for those Pre-payments is becoming obsolete and so we have only got a limited number of meters left to be able to replace the existing meters, so we are keen to obviously find a replacement technology. The other element is the meter tampering and vandalism as well, so the purpose of the Daly River trial is to try and address all of those issues and provide I guess, better services to our customers and also try and reduce the cost associated with having to change our tariffs manually or change our meter manually and so forth.

Mr John Baskerville: We can do it remotely.

Ms Djuna Pollard: So providing we have got the appropriate back-end systems and technology to do that remotely and obviously the communications associated with that as well, allows us to do all of those changes remotely and to get better information coming back into us as well.

Mr Gerry WOOD: Ok.

CHAIRMAN: Do we want to go on to the next subject; we can come back to that.

Mr John Baskerville: So we have talked about solar PV's, Solar City we have done a bit on that, do you want a little bit more on the Solar City progress in Alice Springs.

Ms Nicole MANISON: I would, yes.

Mr Trevor Horman: I think I mentioned at the hearing on the 28th November that there was a report, I do have a report, it does exist and there are a couple of copies if you are interested. It was a trial that went for five years funded by the Federal Government, \$42m was put into it and the economic assessment was that it had pumped \$100m into the economy of Alice Springs, so it was a significant trial. We looked at three classes of customers, there was Residential, Commercial and then there were five iconic projects that we built as part of this project. One of which was the Uterne 1 MW Solar Farm down there. So this manual sets out all the trials that were conducted and the results that came from them. In the domestic sector we did do a cost reflective trial which was really a time-of-use trial. The results of it were quite interesting, it was all voluntary uptake so people could volunteer if they went on to it, so it probably was a biased trial in a way that only people who thought they could save a dollar went into it. But in fact 70% of the people that started in it gained benefits and they found that they could shift load and it was the advent of new technology, like washing machines that you can dial up to start at midnight and things like that, that enabled them to shift load off-peak times. So that was successful.

There were energy efficiency programs, lots of them; there is a case study that I noted here where people put in solar hot water and then they put a one shot booster with it, which is a device where you get up in the morning if you want hot water, you push the booster and it heats it up and then it doesn't start again until you push it tomorrow morning. So it saves a lot of energy on water consumption. There was another program there where it was called 10:10 20:20; if you could reduce your power bill by 10% in a quarter you would get a 10% discount next quarter and if you did 20% you would get 20% discount. I have to say that was funded by the Feds not us, but these particular people in this case study managed to claim the incentive 14 times. So I think actually the kids left home, was probably part of the story.

Mr Gerry WOOD: There was a big demand on candles!

Mr Trevor Horman: Yes. So there were lots of those systems; they put a 2 kW system on their roof and they reduced their power consumption by \$500. So in fact from where they started before the Solar City trial they were spending \$8.33 a day, they got it down to \$3.63 a day just by implementing all the components of the project which did include painting the roof white and those sort of things. In terms of metering one of the popular items was an in-house display; so that you have your smart meter on the front of the place and there is an in-house display so everyone could see what was being used right now and what it was costing you. They are expensive bits of kit,

well they were then, they are getting cheaper but visibility of what was going on is an important part of this whole game of managing your own electricity consumption.

CHAIRMAN: Is there an app. that you can run on your wife's mobile phone for that?

Mr Trevor Horman: Yes, there was a bit of spying going on with all this; you would come home at night: "who had the air-conditioning going all day?"

The commercial program again was quite successful, lots of PV's went on the roofs down there and I think Alice Springs really embraced it, there was about one quarter of the population who engaged with the program down there. So what it meant for Power and Water, we had to have a look at a lot of our systems, particularly the retail billing system and that sort of thing that wasn't used to coping with this sort of stuff. So it was a benefit to us because we had to smarten-up some of those systems and I think our contribution was a modest cash contribution each year, but it was an enormous in-kind contribution with all the work that we did on our systems but we were glad to do it, it set us up for the future. I could go on and on, it was a good trial and very popular in Alice Springs and I think John, you were the founder of this.

Mr John Baskerville: Yes.

Mr Trevor Horman: Rang up one day and said; "What can we do about this", that was back in 2005.

Mr Gerry McCARTHY: And where does the Federal Government sit now, with this?

Mr Trevor Horman: They funded it for five years and it was always clearly going to be for five years and I remember in the initial briefings they made the point to us that it had to be statistically very tough. We had have covariant analysis so that if a customer did two or three elements in the project, you could identify which one was having the effect. We had to hire a statistician for the last couple of years to put all the figures together to prove to them, so it was a robust trial and I think the Feds have got the report and they have got the results in Alice Springs. We sort of regard Alice Springs as a very 'Green' test field down there, the people are sensitive to this sort of stuff and ostracise others that don't get on board with energy efficiency and the like. It is quite an interesting place.

Mr Gerry WOOD: Can I just ask Mr Chairman; you mentioned earlier John, earlier last year I gather the Northern Territory Government was given funding from the Commonwealth for X-number of solar trials, I don't know whether it was solar trials or solar facilities...

Mr John Baskerville: The Arena project.

Mr Gerry WOOD: Can you give us an update on where that is at and perhaps give us an idea of where it has been put in?

Mr John Baskerville: Have we got a paper on it here today?

Ms Djuna Pollard: Did you want me to give an overview?

Mr John Baskerville: Yes.

Ms Djuna Pollard: In October last year there was the joint announcement, or launch of the solar set-up project and it's a jointly funded project \$55m between Arena and the Northern Territory Government proposing to roll-out 10 MW of solar to around 30 different remote Indigenous communities throughout the Territory. It's a four-year program in total and so we are very much in the planning phases at the moment, where we are working through land access, native title, positioning type issues and also working up the program in terms of, because obviously it is quite a large project, just working through which communities will be targeted first and rolled-out first and that will largely be based on which communities it is easier to get these accesses approved and so forth. So in terms of construction, we wouldn't actually anticipate first construction until around two-years' time. So that is sort of where we are at as of today.

Mr John Baskerville: Yes, access to land is the big thing. A lot of the communities don't want it in the centre of their community.

Mr Gerry WOOD: Out of town?

Mr John Baskerville: So we were looking at Bore field runs, you know where we have got power lines going down to the Bore field. But the land access is the big thing.

Mr Gerry WOOD: Is there any variation in the Territory between solar efficiency, that is part of the Territory...

Mr John Baskerville: Alice Springs.

Mr Gerry WOOD: Is Alice Springs better than, well we shouldn't pick on Maningrida today, it's a bit overcast...

CHAIRMAN: Tennant Creek, pick on Tennant Creek.

Mr Gerry WOOD: Well Tennant Creek is pretty dry too but is there anything between say the tropics of the Centre in regards to efficiencies, efficiently increasing production from solar?

Mr Trevor Horman: Gerry, Tennant Creek is the hot spot. But it doesn't vary that much, like you have got this red-band that across the Centre here but up North it is...

Mr Gerry WOOD: Unpredictable?

Mr Trevor Horman: Yes, Katherine is best on the Darwin/Katherine grid, but not by much.

Mr Gerry WOOD: The variation is not that important.

Mr Trevor Horman: No, we look at about 4.5 kWh per kW per day, and there is not much difference between Alice Springs and Darwin.

Mr John Baskerville: Righto, well we are getting into the good area, functionality of various current meters. So we have got some demos to do for you.

Mr Trevor Horman: I think this flowed from the discussion last time; there was confusion about accumulation meters, interval meters, smart meters, and we have brought Kambiz Vessali along to try and explain it.

Mr Kambiz Vessali: First of all I would like to say, I've only been in this job for the last six weeks but as far as the question of the interval meter and smart meter is concerned, it must be noted that smart meters are actually interval meters, with additional network functionalities. What is happening down south, for example in VIC where I come from, is that the smart meters have been mandated by the Victorian government. Therefore the Government has set a minimum functionality for those meters and currently, there is a debate nationally relating to whether Victorian minimum functionality was excessive or sufficient so that it can be adopted nationally. Victorian Network argues that the minimum functionality must remain in Victoria and all smart meters in the market must have this functionality and each Jurisdiction will choose which functionality is to be enabled or disabled.

Today, we brought one of the smart meters that we are currently using in PWC. This meter is a smart meter and has certain functionalities. The most common functionality in smart meter which is also widely supported by the market retailers and the network operators is the remote acquisition of the data and remote energisation and De-energisation facilities within the meters. This means the operator can disconnect or reconnect supply to the meter remotely via communication network link built in the back end system. In addition, there is additional network functionality such as power quality features which are currently debated in the market as the retailers do not believe these functionalities should be made mandated by AEMC in the proposed Rules as they are considered to be beneficial to the network and not to the customer.

The demonstration that we will give you today will also demonstrate the level of information we can obtain from the smart meter such as the Voltage level and the power factor at the source. In addition, we will also demonstrate the remote disconnection and reconnection of the supply to our load which is represented by this little fan.

**Demonstration (transcript in Italics)*

The box containing a smart meter, modem and series of power points in facilitation of the load connection was built prior to the meeting. A small fan was connected to the load side of the meter. The meter was seen to be running. The supply to the meter was remotely disconnected.

The supply to the load was re-instated remotely. The supply to the fan was not stored despite the flow of the electricity to the meter.

Explanation was provided relating to safety feature of the smart meter which highlighted that upon the restoration of the power to the meter, customer will also require to press the button on the meter to allow the flow of electricity

into the load side of the meter. This is as a result of the safety feature built in the meter. This functionality ensures the electricity cannot flow into the load side should someone may be working on the load side during the energisation of the load or the customer may have appliances switched on during the de-energisation and has not turned off the power to these appliances (i.e. oven or hot plates etc.)

A hands-on demonstration is given by Antony.

Mr Kambiz Vessali: It must also be noted that, in Victoria, the responsibility for remote re-energisation and De-energisation for small customers have been passed on to the retailers. However, prior to any work to be carried out by the retailers in this space, the retailers are required to sign up a Memorandum of Understanding with the Safety Regulator (energy safe Victoria) to ensure retailers will undergo the scripted requirements set out by the safety regulator to the customer. The script includes the status of customer should the customer be on life support etc. The retailer has welcomed the opportunity to undertake the remote re-energisation and de-energisation of customers as this will provide them with a commercial advantage to attract customers. The customers are guaranteed restoration of their electricity in their house within 20 minutes of moving into their new homes.

CHAIRMAN: Why would they want to use it, why would you want to turn someone's power off, other than for not paying the bill I suppose?

Mr Kambiz Vessali: There are a number of issues, if the customer actually requests for the power to be disconnected because they want to move out, work on their switchboard. The most common scenario would be on the non-payment of the electricity bill.

CHAIRMAN: Yes, Ok.

Mr Gerry WOOD: Is there a series of nice fact sheets for the customer, so they can understand what their smart meter is all about?

Mr Kambiz Vessali: The problem with down south was that it was a mandated roll-out and the customer fact sheet was developed somewhere in the middle of the program. In other word, the customer education was handled poorly. Most of the smart meters that they have got down south in VIC, they have actually got a label on the meter which actually tells them which button to press and what each of those registers actually represent.

Mr Gerry WOOD: Was there an education campaign to explain what a smart meter is about, because if someone asked me I would still be struggling to say exactly what it does.

Ms Nicole MANISON: Can I just ask a really basic question, going back to the beginning of this again. Normal meter, what we have got compared to an interval/smart meter is that you have it in, is it 15 minute...

Mr Kambiz Vessali: If you are talking about the interval meters regardless of whether it's an interval or smart meter it has got the capability of registering the energy in 15 minutes or 30 minutes, depending on what the requirements are, the NEM is 30 minutes.

**Demonstration (transcript in Italics)*

The old traditional Electromechanical Meters, you don't have that ability of actually registering the meter on a timing basis. Therefore what you have actually got is an aggregated amount of energy for three months, therefore the meter reader goes at the beginning of the month and then the meter reader goes out three months later and actually reads it, and the differences will be the consumption of the energy for you.

All the discussions we have had so far in relation to actual time-of-use tariffs and so forth, it needs to be taken into account, so if you are actually looking at aggregated data through the old traditional meters, that we have got one of those operated meters.

Mr Gerry WOOD: I don't like those, the speed it's travelling around.

Mr Gerry McCARTHY: That comes in Tennant Creek.

Mr Gerry WOOD: Oh we've got them in Howard Springs you know

Mr John Baskerville: There are a few up here still, 50 year old they are.

Mr Kambiz Vessali: This one doesn't have the capability of registering anything in 30 minutes interval, it only measures accumulation data.

Ms Nicole MANISON: What is the price difference between installing a traditional meter versus a smart/interval meter?

Mr Kambiz Vessali: If you're talking about the installation; the installation would actually be at no additional cost...

Ms Nicole MANISON: But the actual equipment, the hardware?

Mr Kambiz Vessali: The equipment and hardware for the interval meters will be more expensive than traditional electromechanical metres. Should you have the remote acquisition, such as this purple box on the right-hand-side that is your modem and the modem is an additional cost.

Ms Nicole MANISON: The ball-park figure; the difference between an old-fashioned meter versus an interval/smart meter.

Mr Kambiz Vessali: I haven't got the figures.

Mr Paul Ascione: The smart meter is about \$250.

Mr Kambiz Vessali: The panel is a single phase; we are looking at single phase with a single phaser. Single phase interval meters they cost around \$150 and for the traditional electromechanical meters, you are looking at \$40 - \$50. But on the top of that one you have got the modem on the top of that.

Mr Gerry WOOD: Does this put the power man out of business?

Mr John Baskerville: The cost to do any modifications to a power box that is on the side of your house depends on what sort of panel it is on. A lot of the panels in Darwin and the northern suburbs rightly or wrongly are asbestos, so when the guy goes along, if he has to drill a hole it's a big chore. So that is the big problem. Tennant Creek and Alice Springs, it would be all asbestos, most of them, some of them are Bakelite but most of them are asbestos.

Mr Paul Ascione: So typically for the meter and the cost is \$250 and then another \$350 to install it, assuming it is not an asbestos panel...

Mr Kambiz Vessali: Different if it's asbestos.

Ms Nicole MANISON: But if it is asbestos?

Mr Paul Ascione: Probably \$1000.

Ms Nicole MANISON: So that is something yes, they are all lovely to have the idea to roll them out but, we have got a few additional challenges up here.

Mr Paul Ascione: We have got a smart meter trial funded in this network price determination period and that commences 2016 and 2017 and it involves about 1000 meters, so we will be doing a trial to see what the total impact is, the cost, the benefits and make a decision when we go to our next reset, as to whether or not we will put up for a major roll-out of smart meters or not.

CHAIRMAN: Our place has got one of these ones, the three-phase and I think looking at the paper work it was paid for by us or the previous owner; the person who built the house because of the solar – would that be right?

Mr John Baskerville: Yes.

CHAIRMAN: So if we got some of these what's stopping us introducing a different charging structure for those places that have already got it, or is that the trial you are talking about?

Mr Paul Ascione: I think Jacana recently announced doing just that, but that would involve changing the meter.

Mr John Baskerville: Yes, time of day, off-peak.

CHAIRMAN: So change the meter again?

Mr John Baskerville: It will need a new meter.

Mr Paul Ascione: But if you've already got one...

CHAIRMAN: We have got one of these ones, like that but slightly bigger.

Mr Gerry WOOD: Like I was saying before, will there be remote meter charging? So will the meter-man be redundant with these?

Mr Trevor Horman: Eventually, yes.

Ms Djuna Pollard: Yes.

Mr Gerry WOOD: It will be like having Wi-Fi system?

Mr John Baskerville: In time, yes.

Mr Trevor Horman: Over time, yes.

Mr Gerry WOOD: What will my dog do? I mean I love those little green slips on the fence; "Can't come in, will have to guess your power bill this week".

Mr Trevor Horman: That's an increasing problem with access to meters; gated communities and those sorts of things.

Mr Gerry WOOD: Well this will also make a difference.

Mr Trevor Horman: What I think we need to emphasise is the cost of the meter is but part of the scene, there is the communications network and then the huge computer deal behind it all. But that's what the trial will be about, to suss all that.

CHAIRMAN: And the computer works on-peak loads as well, of course?

Mr Trevor Horman: Yes, it will be much more intelligent with what it will pump out and give options to customers.

CHAIRMAN: No, I was thinking of how we'd do the network and generation will work for the peak loads. Computers have got the same problem and they haven't solved it yet.

Mr Gerry WOOD: They have got a peak load machine now that comes on at midnight, does the washing machine actually take the clothes out and hang them on the lines, so they are dry by the time you get ready for work? That's one of the problems with some things being off-load they are not necessarily practical from the point of view of as state of the art washing machines because you put a washing machine on when you come home at 6:00 p.m., the washing is done, you hang it on the line and in this part of the world generally, it is pretty dry by the next day. But if you put it on at midnight, you don't have that finished. I am not saying that is wrong, but I am just saying sometimes the ideas are good but not always practical.

Mr Trevor Horman: Well if you are like me Gerry, you notice the washing needs doing at 10:00p.m. and that is when you go and do it. But I think a better example, another technology disruption we are looking forward to, is electric vehicles; they are starting to happen and it is going to come on with a rush. What we are anxious about is somebody goes home 6:00 p.m. plugs in the electric vehicle and starts charging, switches on the air-conditioner and all the other things that I mentioned earlier you get a system peak that is more than it was before. But what we have got is the possibility through these smart meters is to control it; so when you plug it in it actually keeps discharging into the network, helps the network until about 11:00 p.m. and then we say; "Righto, you can start charging now", and charge for the rest of the night. So there are lots of upside for smart meters, for the network and for the customer and that is what these trials will all start to explore, what functionality it needs and what we can do.

Mr Gerry WOOD: If you are going to look at that would you also look at Power and Water providing a service that people, when they go to work can charge? In other words, because the car is sitting there all day and it's not doing anything and that is the non-peak load, I presume during the day; I know the university has a place where

you can plug-in your electric car. I mean I am not against electric cars but if you are saying that is a problem, then we are also looking at the other way of using the time that is a low-demand time for the charging of a vehicle.

Mr Trevor Horman: Yes, there is rapid charge and slow charge and all sorts of things. The other thing people often look for is a Green power point to plug their car into so there is a whole lot of dimensions we have got to look at and while there is only a dozen Tesla cars in Australia now, it's coming.

CHAIRMAN: Just on the washing machine, in actual fact the ones that I have seen around, and we have got one at home...

Mr Gerry WOOD: Take your clothes out

CHAIRMAN: No, they don't take the clothes out. They don't actually have the start at 10:00p.m., it's like a delay, it asks "when you want it finished"? So you turn it on at 10:00 p.m. and you say you want it finished at 6:00 a.m., my wife usually comes to me and says; "Gary how long do I have to delay it for"? So you actually put in when you want it finished and you don't do a time, you actually say; "I want it finished in eight hours", and it works out backwards from there when it actually starts, based on the cycle that you have put in. So they are actually quite intelligent washing machines.

Mr Gerry WOOD: And then you get one big lightning strike and you're all up the creek!

CHAIRMAN: And the air-conditioners do a different thing, they have a sensor so if you don't move in the room every hour, it increases the temperature by two. So if you have got your room set at 25° it runs at 25°, but if you haven't been in the room for an hour it then changes it to 27°, so it then only maintain 27° and it keeps going all the way up to 30° before it just maintain at 30°.

Mr Gerry WOOD: If you keep moving does it drop it down by 2°?

CHAIRMAN: Well I'm just hoping it doesn't pick the dog and cat up

Mr Gerry WOOD: Just like you might get all frozen by the end of the night.

Mr Gerry McCARTHY: And in Tennant Creek we put the washing on the line and by the time we finish that, you start taking it off, it's very efficient.

Mr John Baskerville: Not a big take up of dryers down there, Gerry.

Mr Gerry McCARTHY: No.

Mr John Baskerville: That is just about the end of what we had to present, if there are any other questions of the team while we are all here?

Ms Djuna Pollard: Would you be interested in an overview of the electricity network pricing framework?

Mr Gerry WOOD: And have you got anything on as I said I was asking if there were any fact-sheets on smart meters? Obviously a customer has got to understand what they are about and we need to understand.

Mr Trevor Horman: On our website, it has got a sheet of; "How do you read your meter".

Mr Gerry WOOD: Not that website again

Mr Trevor Horman: It's user-friendly, it has been updated.

Mr Gerry WOOD: Ok, thanks.

CHAIRMAN: Do we want to have a five minute break, so you can all get a cup of coffee or something. If people want to get a cup of coffee or just stop for five and come back.

CHAIRMAN: Djuna; if you want to have something to say first off, we will get you.

Ms Djuna Pollard: We thought there might be some benefit in just providing a presentation on the broader regulatory and pricing framework, as it relates to electricity network pricing. And it would probably be best to hand over to Lucy who is our Manager Economic Reform, to just run through that.

Ms Lucy Moon: From 2012 – 2014, power networks went through a very comprehensive pricing review, so it would have touched on what Paul touched on earlier in terms of the capital projects. Each individual capital project was reviewed by the Commission; every individual project was reviewed by the Commission with the aim of having a look at power networks requirements over the next five years. So what sort of capital projects they need to undertake, what maintenance programs they need to undertake with the view of developing a revenue requirement for the five year period to the maximum allowable revenue that power networks require to undertake all of these sort of things. They looked at prudence and efficiency and the end result was revenue allowances for each five years, so percentage increases in revenue.

From that we then every year submit a tariff proposal to the utilities commission, our regulator, and there for the standard control network tariff. So not only does the network price determination set the revenue allowance, it also sets a network services classification which determines the types of services that power network provides and the charging frameworks under how each one operates. So the main ones when we refer to network tariffs are the standard control network tariffs, they are charged to all consumers that are connected to the electricity network and they are power network's core functions. So essentially maintaining and supplying electricity.

And then we also have alternative control service charges, so they're miscellaneous changes that are only charged to customer that request the service, so they might be things like if you need a special meter test or if you need a special meter read, or wanting to exchange or replace the meter. So we charge those individually to customers and while their services classification and the type of services are set by the independent regulator, they're regulated under our electricity network third party access code and the Power and Water Board ensures that they are fair and reasonable and we set those tariffs every year. And there are also other services called excluded network services that are subject to competition. So they are things that power networks can provide but also alternate competitors can provide, so while they are also under the fair and reasonable terms other suppliers can supply them and they are provided on a quoted basis for things like consultancy services, etc.

Like I mentioned before, the main focus is the standard control network tariffs. So we currently have, two main types of consumers: we have customers that consume more than 750 MWh per annum and customers that consume less than 750 MWh per annum and then it is further broken up into domestic customers, commercial customers and according to that class of customer, it determines the types of metering arrangements that they have and therefore the types of tariffs that we can charge these customers. So every year we put up a very comprehensive submission, you would find it on the utilities commission website and then an abbreviated version on our website which demonstrates a whole lot of compliance requirements that we need to meet. Including, that we are meeting a revenue allowance; that we are meeting certain regulatory constraints; charging according to our marginal costs; avoidable costs; stand alone cost of supply.

For those large customers currently who are above 750 MWh, they all have interval meters installed and therefore we have more flexibility, in terms of the pricing structures that we can implement for those. So those customers are charged demand charges and consumption charges and a fixed charge – so that is for the 15-minute interval meters that read that. For smaller customers they are also charged a fixed charge, so that is just a daily cents per day charge and also because they have the accumulation meters, so they are the meters that Kambiz mentioned we just go and read every three-months or if you're a commercial customer generally every month, and we just have a kWh charge for those customers, cents per kWh charge.

What we are looking to do this regulatory control period, and what the commission determined was a prudent and efficient capital project, was to roll-out interval meters to customers consuming between 40 MWh – 750 MWh, because there are a lot of customers in there, we then have the flexibility to potentially introduce a charge before all customers are rolled-out, by giving people the option to move on to that sort of charge or whether we want to wait until all of them are rolled-out and then implement tariffs to support that. But ultimately that will allow us to gather the necessary data that will support the investigation of more cost reflective charging options, which may assist in addressing some of the issues that we have with peak demand and also with solar PV's in the sense that how we are mentioning how there is that cross-subsidization between consumers. Because if you are a customer that only has a consumption charge, your consumption drops but the demand that you are placing on the network doesn't necessarily change, where you're not paying as much as someone that just doesn't have PV.

We are also looking now, currently you will see there is quite a number of steps for each individual charge, so each peak charge, each off-peak charge for large consumers is five steps. And they are declining so the more you consume the less you get charged, so what we are looking at is to potentially reducing the number of steps and also maybe move to a flat charge or an inclining-block charge or potentially looking to things like interstate where a lot of network providers have capacity based tariffs. So they are things like, as opposed to each month large customers are charged for their demand within that month and then it is variable. So obviously in the wet season you would have a larger demand than you would have in the dry season in somewhere like the Darwin Katherine

grid, so in the dry season you are charged a smaller demand than you would in the wet season, but we have to bill the network to handle that wet season peak. So these are all sorts of things that we are investigating as ways to influence consumer behaviour and encourage people to manage their demand, to understand the real cost that they do place on the network and to ultimately reduce the increase in the peak.

One of the other things we have is a network technical code that sets power factor specification locations. I am not the best person to give you an explanation of exactly what power factor is, but it sets a mandated requirement in terms of what your power factor should be and we currently have a number of consumers that are non-compliant with the power factor specifications, so to complement a customer education process that we will undertake probably over the next year, we are also investigating something called an excess kVAr charge which seek to incentivise compliance with the technical requirements that are set by the commission independently of us. Any such charge wouldn't increase power networks revenue because we have a set amount of revenue that we can recover from customers, it is just about seeking to influence behaviours.

With the different types of customer classes, we have got a cost of supply model that we submit to the commission and that goes down to the level of looking at the different customer types and looking at the cost that they impose. And we know how much revenue we get from those customers classes and we now know how much costs they impose on the network and it is looking at rebalancing the network tariffs to ensure that they align. So I don't know if there any questions that you have?

Mr Gerry McCARTHY: An electricity user that imposes a cost on the network, in that last explanation, would be who? A big industry?

Mr John Baskerville: Most would be the larger customers...

Ms Djuna Pollard: Large commercial type customers.

Ms Lucy Moon: What our model shows is that some large customers with a poor power factor are not paying for the total cost that they impose on the network. An excess kVAr charge like that which has been implemented in South Australia by SA power networks has been found to be an effective tool to incentivise compliance with the power factor requirements and reduce the costs imposed on the network.

And as with any charge that is designed to influence customer behaviour, we would ensure customers were given enough time to improve their power factor and respond to the pricing signals by installing capacitors to reduce their power factor.

Mr Gerry McCARTHY: And this is a national move, this has been driven by the Federal Government?

Ms Lucy Moon: A national move for the excess kVAr or just generally cost reflective network tariffs?

Mr Gerry McCARTHY: To create lots of efficiency?

Ms Lucy Moon: On cost reflectivity; there is more and more, the AEMC is looking at ensuring that network providers set efficient tariffs and looking at moves towards long run marginal cost based tariffs, but ultimately it is in every electricity consumers best interest that we do have cost reflective network tariffs that are able to provide price signals and enable the customer to manage their demand, because that will ultimately drive down our capital requirements going forward. So then we might not need to augment that zone substation, because every bit of infrastructure that we add to the network will add to the revenue requirements that the network provider requires which ultimately increases network tariffs.

Mr Gerry McCARTHY: So that is good on that side, one of the big challenges must be all the new suburbs coming on line, yes, in terms of your planning for the network?

Ms Lucy Moon: Like Paul mentioned, we have a comprehensive plan of all the capital requirements for the next five-year period, as well as a higher level transmission system plan for the next 10-year period. But the utilities commission, because a network price determination as it's treated interstate, are for five-year periods, so we need to look at it at a five-year timeframe and look at what is required over those five years. But the new suburbs would be...

Ms Nicole MANISON: You did some work in my patch as well!

Mr Paul Ascione: Yes around, Lyons in Muirhead, so for Lyons and Murihead we are building the Leanyer Zone Substation, which is down near the sewerage ponds there. The construction is actually completed, we are into the testing phase and that should be commissioned this year; and in the Palmerston area we have built the Archer

Zone Substation to back up the Palmerston Zone Substation and we have also got the a project to put a third transformer at the Palmerston Zone Substation to deal with those load increases.

Mr Gerry WOOD: What is the point sorry, between what you supply and what the developer has to put in?

Mr Paul Ascione: Developer puts in the infrastructure within the development itself. He is responsible for putting the cables in the ground, the substations, or the transformers, the switch gear, the feeders generally from the substation to the development. It was previously done by Government but things are now being done by the developer, so we are just responsible for the transmission and zone substation side of it.

Mr Gerry WOOD: Is that a clear demarcation? So if I want to build a suburb I know exactly what costs I'm going to incur from an electricity point of view?

Mr Paul Ascione: It's all covered in our Capital Contributions Policy.

Ms Lucy Moon: Which, is approved by the commission every five-years and when we look at our capital requirements, they take into account what capital contribution policy we expect every five-years and that covers small customers, large customers, developers and generator users.

Mr Gerry WOOD: Because the areas that I get the complaints about sometimes, is the cost of a connection in a new development or the time taken for that connection and I recently did have one where, I won't tell you who it was, but in my area they paid up front \$20k some months ago when they wanted the connection and it just didn't happen at that time. So that is an area that I get complaints about; sometimes I get complaints about the cost of connection and sometimes the requirements that Power and Water want on the network for private developers and sometimes delays in getting things done. I don't know whether you look at that as something you could improve on?

Mr John Baskerville: PWC have a works/project planning – scheduling time keeping upgrade taking place which will take care of most of your concerns.

Ms Lucy Moon: And we have a mandated service and it is for things like connection times, that we need to report every year to the utilities commission for our regulated network, for our performance against those performance standards. And for connections for small customers, our network capital contribution policy doesn't make them pay the full cost, it also take into account the future revenue that we will receive from these customers and discounts that from capital cost. It has things like cost sharing regimes, so if you build a full line, if you are a small customer and then someone else connects to it within a certain time period there will be cost sharing between customers. So we would try and make it fair and equitable and when we developed that policy we looked at interstate policies to ensure that we are sort of comparable.

Mr Gerry WOOD: So how do you put into the economic side of the system, do you have a new development? Do you get all the network that is put in there by the developer, free? So if I've got a new subdivision in the rural area and a developer puts in all the power lines, the poles, and when he wants approval everything is ticked off and you get all that infrastructure. So if you get it for nothing and someone complains about it, how does that work from a book point of view? You have been gifted a whole new network...

Mr John Baskerville: Then we have got to maintain it, so that is where the...

Ms Djuna Pollard: And replace it.

Mr John Baskerville: ...and replace it, as it fails.

Mr Gerry WOOD: But some may take a fair while before you have to replace them, like 80-years you mentioned was Tennant Creek; so you get a...

Ms Lucy Moon: And when we do replace it then we start owning the return on the asset, otherwise it is viewed as a gifted asset.

Mr Gerry WOOD: There are a couple more, one is I mentioned last night the Councils and the issue about – what is the present status of the negotiations between yourselves and the Councils having to pay for lighting? Is it still ongoing?

Ms Djuna Pollard: 1 January last year we essentially commenced charging for the energy consumption element and so those invoices have been going out to Councils since then and this was on the back of us wanting to unbundle the street lighting charging arrangements.

Mr Gerry WOOD: Can I just ask, some roads are Councils and some roads are Government.

Ms Djuna Pollard: Department of Transport, yes.

Mr Gerry WOOD: Do you have to distinguish which ones on an intersection belong to the Council and which ones don't? And then they are only a single pole, but how do you know the consumption, do you count the number of poles and the number of lights and work it out that way?

Ms Djuna Pollard: Yes and based on Wattage associated with different...

Mr Gerry WOOD: And they can be varied in wattage?

Ms Djuna Pollard: Yes.

Mr Gerry WOOD: So it's not so simple?

Mr Paul Ascione: It depends on the wattage of the light; is it an 80 kW light?

Mr Gerry WOOD: Yes, but you have got a lot of lights so you have to distinguish between different wattage, and also you have got to distinguish whose road it's on as well.

Mr Paul Ascione: We do that, we kept all the information in our system, our geographical information system.

Ms Djuna Pollard: And so the next stage was to commence charging for street light repairs and maintenance charges; and so throughout the course of last year we were engaging with the Local Government Association of the NT on behalf of Councils and also with the Department of Transport, about introducing that charging arrangement and the invoices for the repairs and maintenance charges are due to go out, I think by the end of this month.

Mr Gerry WOOD: The Minister last night said "This is a better system because Councils can do the repair and maintenance – they just get a cherry-picker and do it themselves". Is that actual or is it just theoretical?

Ms Djuna Pollard: Yes, in Katherine at the moment I think it's the Department of Transport – they outsourced, we don't do the repairs and maintenance services there for street lighting, it's a third party that provides those services.

Mr John Baskerville: And in Alice Springs they've actually gone out to see whether there is anyone interested in doing the street lights down there for them.

Mr Gerry WOOD: So who will own the street light; the pole, and the light?

Ms Djuna Pollard: The responsibility rests with the road controlling authority, so either being the Department of Transport if it's public roads or the Councils if it's Council roads.

Mr Gerry WOOD: If the light is on a power pole not a standalone pole, then who owns what and who does what? So if it's coming off a standard old-fashioned pole in Rapid Creek and there is a light off that, whose responsibility is that?

Mr John Baskerville: They are our poles. If they are a power pole they are our poles, if there is a light on the power pole that is the discussion we are having with Councils.

Mr Gerry WOOD: That would require someone with a fair number of certificates to be...

Mr John Baskerville: And one of the impediments there is that we don't want contractors working on our power poles.

Mr Gerry WOOD: Was there a charge being put for long term replacement and is that being...

Mr John Baskerville: It's all factored in.

Ms Djuna Pollard: That would be the third tranche, the introduction of the capital charge, but we are wanting to do the Repairs and Maintenance charge first.

Mr Gerry WOOD: That is the reason I asked who owns the poles because why would you be putting a replacement factor in if you didn't own the pole anymore, but that is up to the council, and one of the concerns I had from the Local Government was; "Were we going to be charged this extra charge for something that might not happen for another 30-years"? So has that discussion now been finalised or is it still ongoing?

Ms Djuna Pollard: No it's still ongoing

Mr Gerry WOOD: The other issue; you also look after Indigenous Essential Services?

Mr John Baskerville: Yes.

Mr Gerry WOOD: Now they get subsidised by the Government, a considerable amount, do you do economic reform process for that section of your responsibility? In other words, are you trying to reduce the cost of running electricity there, trying to reduce the subsidies from the Government?

Mr John Baskerville: Yes.

Ms Djuna Pollard: It is not part of this particular framework that Lucy has just been talking about, there is a different funding model if you like, and as I understand John would know more but there is constant dialogue between ourselves, Treasury and Finance and Community Services.

Mr John Baskerville: Community Services that is where the funding comes from.

Mr Gerry WOOD: But obviously they would like to reduce that, the community service obligation and I didn't know whether you, you as the people who operate it, have also got similar processes going out about economic reforms.

Mr John Baskerville: It's not the same as what Lucy described, but we are sort of mirroring it in the IES (Indigenous Essential Services) area, so yes, it's ongoing we are on a real efficiency drive out there.

Ms Djuna Pollard: Yes, we have varying degrees of, shall I say, formality across our pricing or our regulatory framework. The electricity network is the most prescriptive and then IES for example, is less prescriptive than that and then the arrangements around water and sewerage charge are not as prescriptive as the networks as well. So yes there are different arrangements if you like, for the pricing of the different products or services that we provide.

Ms Nicole MANISON: I have just got a couple of questions, just listening to Trevor talk about some of the examples about going out and working with some of your business customers and the Alice Springs Solar Cities example, to me it sounds like dealing with your peak demand issues and planning, that there are some gains you can make through education and working with the companies and businesses, getting down to the household customers a bit more individually. Is there much work happening in that space, aside from what you are doing Trevor?

Mr Trevor Horman: At the domestic level?

Ms Nicole MANISON: I suppose I am keen to hear about the business level and also the domestic level.

Mr Trevor Horman: Look, I would have to underline every trial we have done, Solar Cities and anything else. The dollar is behind it, they are always looking for what is the reward for me, so that is why the pricing signals have to be there to back up the technology that comes along. But yes, we talk about sophisticated customers and some of them you can sit down with they really understand power factor, they understand the whole deal and they are just looking for; "when are you going to give me a signal to do something about it". But that is why this is an important discussion; for us to get all these issues on the table so that you people understand what is going on. But yes, we find that they're intelligent and they want to do stuff and they often say; "why don't you come and sit down with us, we will tell you our problems, you tell us your problems" and there might be a solution between it all.

Mr Paul Ascione: I think we will get a lot of bang-for-our-buck out of this excess kVAr charge, because the pricing signal hasn't been there for them to invest in the equipment to fix their power factor. We sit down with them, but they obviously go back and if there is no financial benefit that capital project doesn't get up. There will be a financial benefit now and what we saw in South Australia was a phenomenal increase in their power factor over five-years which means they are pushing system demand down.

Ms Nicole MANISON: And from a networks perspective, this is probably a very easy question to answer but I want to put it out anyway, have you found it much easier when we are talking about the households that are putting on solar and dealing with that uptake, first as a company comes in to build a solar farm, for example is it much easier to deal with that certainty of the solar farm as opposed to dealing with the individual households coming online at a rate that you can't really predict what the uptake is going to be?

Mr Paul Ascione: Not really, I mean the policy at the residential level is a policy that is designed so everyone can have solar.

Ms Nicole MANISON: Yes.

Mr Paul Ascione: So it is basically pre-approved, so it's quite a simple process - they come in, ask for 4.5 kW they get 4.5 kW and it is quite simple. The bigger ones are actually more complex because we have to negotiate an individual agreement with each of those big ones and that can take quite a bit of time and quite a lot of capital investment on their side to meet our requirements. For example, Uterne Stage 2 has taken probably six months of negotiation, but we get there.

Ms Nicole MANISON: Ok, thank you.

Mr Trevor Horman: Look I'll bring up an important point there, what the solar generators do is generate kWh they don't generate the reactive power we are talking about, with a reactive charge. So one of the conditions we put on them is they have to fix the power factor and make sure it complies as part of the project and what they find is it's not very expensive to do it. So once that message gets out there, we are getting better compliance.

Ms Nicole MANISON: Ok.

Mr Trevor Horman: But the excess kVAr charge will be a straight up message and you get payback periods of about 15-months, it is really fast.

Ms Lucy Moon: And initially that will just be for the large customers, but they are the customers that will have the best pay-pack period. But also in terms, of what we touched on before, all of these things that we want to implement and all the capital projects that we have sitting behind in order to implement it, we really need to have the retail electricity tariffs that then support that because being a large customer you don't get a single bundled charge. We have an example of a bill that a large customer will see and they can see their individual build-up of their retail tariff, whereas if you are a customer like myself we just get charged cents per kWh and a fixed charge. So if we are not driving home these behaviours, on the bill that they see then there is not so much you can do.

Ms Djuna Pollard: So this is an example of an invoice that would go out to a larger customer at the moment. So on the front they get just a summary of how much their electricity charges are, but on the back it disaggregates it into the regulated charges which are your system control and network and then breaks it down into your energy demand components, non-regulated is the generation and the retail cost and margin combined and then environmental charges. So it clearly sort of outlines where there are choices that they could make potentially, around managing their electricity accounts. But for our residential customers they don't get this disaggregation on the back.

Mr Gerry McCARTHY: With the power factor, the aging industrial areas for instance, you would have an aggregation of inefficient power users in an area, let's say in Winnellie. So that is going to be a big challenge isn't it, to try and get each one to do something individually?

Mr Paul Ascione: I don't think it will be, because the pricing signal will be there for them. If they are not complying now with the technical code and they have a very poor power factor, their payback period will be quite quick. Certainly back in around early 2000 there was a widespread lot of power factor correction going in and we must have had the triggers back then and somehow we lost that, I am not sure why but we were heavily involved at that time, in putting power factor correction into the airport, small businesses, halls, factories, CDU. But there was a big push and obviously the payback period was there and businesses will put it in. I don't see it being a big issue at all.

Mr Gerry McCARTHY: Because where I was heading I was thinking of the opportunity to relocate, as opposed to trying to do up the 'old Holden', if Government went that road of...

Mr Paul Ascione: We are not asking them to replace their equipment, power factor correction is really simply just putting in a box and connecting it to your switchboard and then that box has a whole series of capacitors. But it's

not something where you have got to replace your motor, but that may be an option for you but power factor correction is fairly simple to install and commission.

Ms Lucy Moon: With all of these initiatives we also look at the impacts on customer classes, so we wouldn't implement something we are actually not able to according to our regulatory constraints. We have things like side constraints so in our submission to the commission it looks at the revenue that we receive from each tariff class and then looks at the changes between each financial year, and we are constrained in the swings that we can provide for each tariff class. So these are gradual changes that we need to make in order to minimise the price shocks to customers. So even if we are looking now that maybe large customers aren't paying the true allocated cost of the network, we wouldn't change it in one year because that might be too much of a price shock. So we try and minimise those sorts of things when we are looking at rebalancing our tariffs and putting in our tariff submissions to the commission. And likewise with the introduction of a new charge, that we go under a certain tariff class and help to make sure those customers aren't impacted too much by that.

CHAIRMAN: Okeydokey, thank you very much that was pretty good, nearly two hours.

Mr John Baskerville: A lot of work going on behind the scenes in this particular area.

CHAIRMAN: I am sure we will get you back again. Thanks again all, for coming along. Much appreciated.