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12th Assembly

Committee on the Northern Territory's Energy Future

Public Briefing Transcript

11.00 am – 12.30 am, Friday, 11 October 2013

Litchfield Room, Level 3, Parliament House

- Members:** Mr Gary Higgins, MLA, Chair, Member for Daly
Mr Kon Vatskalis, MLA, Deputy Chair, Member for Casuarina
Ms Larisa Lee, MLA, Member for Arnhem
Mr Gerry McCarthy, MLA, Member for Barkly
Mr Gerry Wood, MLA, Member for Nelson
- Witnesses:** Mr Mike Burgess, Chairman: Indigenous Essential Services Pty Ltd
Mr John Baskerville, Managing Director: Indigenous Essential Services Pty Ltd
Mr Jim Bamber, General Manager Remote Operations: Indigenous Essential Services Pty Ltd
Mr Trevor Horman, Manager Sustainable Energy: Indigenous Essential Services Pty Ltd
Ms Megan Jolley, Manager Energy & SCADA Strategy: Indigenous Essential Services Pty Ltd
Ms Anne Tan, Senior Executive Manager Strategic & Business Services: Indigenous Essential Services Pty Ltd
Ms Djuna Pollard, Executive Manager Economics & Regulation: Indigenous Essential Services Pty Ltd
Mr Charles Staples, Gas Marketing Manager: Indigenous Essential Services Pty Ltd

Mr CHAIRMAN: We will start again. I need to go through the preliminary reading again. I will miss the names if that is all right. We can send a copy upstairs.

On behalf of the committee I welcome everyone to this public briefing on the key challenges and opportunities associated with meeting the Northern Territory's future energy needs. I welcome to the table to give evidence to the committee those whose names we will supply. Thank you for coming before the committee. We appreciate you taking the time to speak to the committee and look forward to hearing from you today.

As you know, this is a formal proceeding of the committee and the protection of parliamentary privilege and the obligation not to mislead the committee apply. This is a public briefing and is being webcast through the Assembly's website. A transcript will be made for use of the committee and may be put on the committee's website. If at any time during the hearing you are concerned what you say should not be made public you can ask the committee to go into a closed session and take your evidence in private.

I will also ask each witness to state their name for the record and the capacity in which they appear. I will then invite you to make a brief opening statement before proceeding to the committee's questions.

I will start with Trevor at that end and go down. We are dealing with Indigenous Essential Services at the moment.

Mr HORMAN: Trevor Horman, Manager, Sustainable Energy.

Ms TAN: Anne Tan, Senior Executive Manager, Strategic and Business Services.

Mr BURGESS: Mike Burgess, Chairman of Indigenous Essential Services Pty Ltd.

Mr BASKERVILLE: John Baskerville, Managing Director, Indigenous Essential Services Pty Ltd.

Ms JOLLEY: Megan Jolley, Manager, Energy and SCADA Strategy.

Mr BAMBER: Jim Bamber, General Manager, Remote Operations.

Mr CHAIRMAN: Mike, would you, or anyone else, like to make an opening statement?

Mr BURGESS: I do not believe that would be worthwhile. We have already covered a number of issues and if you have specific questions we will just go straight into it.

Mr CHAIRMAN: The first question I would like to ask about Indigenous Essential Services is can someone provide an overview of the key elements of the energy source strategy towards 2020?

Mr BURGESS: Megan.

Ms JOLLEY: The Remote Energy Supply Strategy was first established in 2009, and was in response to the volatility around the diesel price financial risks that was facing service delivery in remote communities. The mandate for Indigenous Essential Services Pty Ltd, under the contract we have with the Northern Territory government for the provision of electricity services to remote communities, is to provide a least cost long-term electricity supply. We needed to have a strategy in place that ensures we do that.

The energy strategy is underpinned by an economic analysis of various energy source options that are available at each of the 72 Indigenous communities we service. Where that economic analysis indicates there may have been a technological or market change changing the supply costs of

different options, then we undertake a more detailed business case analysis of those options to determine whether we should switch energy supply of those communities.

I can talk a little more about the initiatives we are implementing under the strategy, if you like.

Mr CHAIRMAN: I go to the solar powered generation. I would like to know what the current status of the roll-out of solar power generation is in the growth towns and what capacity is there if you start to set up some commercial or larger commercial activity in these growth towns?

Ms JOLLEY: I will answer that question in two parts. I will start with the second part, if you like, of the capacity. Over the last few years since around 2004, we have been very focused on ensuring there is sufficient capacity across remote communities to meet the forecast demand. We have seen an increase in electricity demand across communities over the last few years driven by population growth and government investments in various infrastructure and services programs under the Closing the Gap program.

For the foreseeable future, by and large, there is sufficient capacity to meet forecast demand in remote communities provided there are not significant developments we are not aware of that come online in the immediate future.

In the solar roll-out proposal, one of the things we have determined under the energy strategy is - I should go back a step. You are probably aware that, predominantly in remote communities, electricity is generated by diesel-fired power stations. There are 52 we manage across all of those communities, and they supply around 56 of the IES communities.

Under the energy strategy, we have determined it is, over the long term, more economic to displace an amount of diesel consumption with solar generated electricity. We are implementing a program to achieve that. We have started in the recently commissioned Ti Tree/Kalkarindji/Lake Nash project under which we purchase solar energy from a third party provider for supply to those communities over a 20-year period.

We also support the installation of PV systems by customers. There is around 450 kW of customer-installed PV across remote communities. There are a number of other solar systems we manage in remote communities including the solar dish systems at Hermannsburg, Lajamanu and Yuendumu.

In terms of future proposals, we have been talking to the Australian Renewable Energy Agency about them funding a large scale roll-out of solar across our currently diesel-only power station sites and integrating those systems into the diesel power stations to displace around 15% annual diesel consumption.

Mr WOOD: You mentioned Hermannsburg solar ray, and you also connected Hermannsburg to the grid. How do the two work together there?

Ms JOLLEY: The solar dish system will continue to operate, so it will be displacing gas once the Hermannsburg power line has been constructed this year. So it is still under construction.

Mr WOOD: So, Hermannsburg at the moment is not connected?

Ms JOLLEY: No.

Mr WOOD: I thought it was.

Ms JOLLEY: Not yet. We are getting very close.

Mr BAMBER: We are 50km into the 90km line.

Mr WOOD: I noticed we had it here, and I heard about it being on a budget to happen but I did not know how the two would fit together.

Mr McCARTHY: Can I ask a question? So we get into a micro example. At Ramingining, there are 27 new houses being constructed; there is a construction camp, and contractors are building a new road there. Suddenly, there is a very significant increase in demand in the next 12 months. Then you have the consumer who is the unpredictable; that is the 10 amp air conditioners going in the windows. How do you manage that? Is it just waiting to see what demand occurs or do you have to put in extra sets? How is it managed?

Ms JOLLEY: In the same way that wider Power and Water does. We work very closely with the Northern Territory government to understand what future developments are planned for in remote communities to ensure there is sufficient power station capacity to supply that demand. In terms of day-to-day fluctuations in consumer residential demand, the power station is configured in such a way that it can handle those fluctuations. Across all the power stations, we have either three or four different sized engines and the engines that are running at any particular time are matched to customer demand.

Mr McCARTHY: That is a fairly volatile market, I would imagine, when people are operating on power cards. One week a house may be using a great deal of power but there might be a week when that house is not using much power.

Ms JOLLEY: You are exactly right. We do see fairly significant fluctuations over the course of the day and from season to season. That is why it is important that the power station engine sizes are appropriately matched to be able to supply that changing demand.

Mr BAMBER: The multiple assessors we have, as Megan said, are different sizes. But they are all connected together with a smart control system, so they respond to the demand by putting on a bigger or small engine, or even running two sets in parallel to cover the demand. All our power stations are set up that way.

Mr McCARTHY: You are obviously following the roll-out of these housing programs and the planning has been done. I went to Maningrida to look at 110 houses, for instance, and street lights and all the other associated urban forms.

Ms JOLLEY: That is right, and across the major towns, particularly the north, there are a number of power station upgrades that were undertaken under the SIHIP program in view of what was to come under those NT programs.

Mr McCARTHY: Mr Chairman, do you want to get to the demand side later or can we discuss it now?

Mr HIGGINS: No, go now.

Mr McCARTHY: That is the next layer in terms of what I am interested in. What is happening in the education of the consumer in a new home with the new white goods and air conditioners in terms of their power usage and efficiency - we are talking about Indigenous communities?.

Ms JOLLEY: Power and Water has been implementing efficiency programs in particular remote communities for some years now. We have been quite focused on consumer education around

the benefits of efficiency in managing household budgets and maintaining the community water resource.

We have a dedicated demand management team within remote operations focused on energy and efficiency programs. A significant project recently commenced which received a large amount of funding - \$9.4m - from the Australian government called the Low Income Energy Efficiency Program. We are working with a number of project partners, including the Department of Housing, East Arnhem Shire, Charles Darwin University and Bushlight to implement that program.

Under that program we are looking at a range of things with the objective of determining, for the future, the mix of education and energy efficiency retrofits we should roll out. The program will undertake a number of different things and we will do an evaluation to determine the most effective approach for the future.

Mr McCARTHY: Anything else in the Barkly or Central Australia? Is that a Territory-wide?

Ms JOLLEY: That program is just focused on East Arnhem Shire communities. I might have to take that on notice in relation to whether we have anything currently under way in the Barkly region.

Mr McCARTHY: I am sure there will be by the way, but yes.

Mr WOOD: We are looking at future demands and how we can reduce our energy needs. On Indigenous communities you supply water and sewerage, which requires power as well. What you are talking about is the total package - do not have leaking toilets, use the left button and not the right button, and plant native trees instead of having lawn out the front. Is that part of the program as well?

Mr BAMBER: We have focused more on water constraints with our demand management programs than we have on energy. We have far more advanced water demand management programs.

Mr WOOD: Yes, and that is good, but leading on from that is the less water you need the less need to pump, which is a saving in energy which is a saving in total costs. We probably did not discuss enough, even for Darwin, the cost of providing water for the city of Darwin and surrounding areas must be a fairly large amount. Again, energy is required to do that. How can we change and reduce our energy consumption?

Mr BAMBER: The broad answer is yes. When we look at energy production associated with water and wastewater treatment, the demand management program we have is looking at reducing the overall energy consumption into communities. We have some quite well-advanced programs where we have rolled out smart metres into communities such as Santa Teresa, Gunbalanya and Milingimbi, and we are working closely with the community and other agencies which provide services into those communities, such as Department of Housing, so we can work together to reduce demand.

Mr CHAIRMAN: Can I have an update on the Daly River solar energy project? Is Wadeye swapping to gas? We have touched on Hermannsburg, and there is Alpururulam with the wind solar diesel hybrid. Can we have an update on where those ones are?

Ms JOLLEY: I will start with the Daly River project if you like.

Mr CHAIRMAN: Very good, it is always at the top of the list.

Ms JOLLEY: So, for background, the Australian Solar Institute, as it was called at the time, which is also the Australian Renewal Energy Agency, funded Power and Water \$500 000 to undertake a solar/diesel load optimisation research project which is focused on Daly River and ...

Mr CHAIRMAN: That is a complex name.

Ms JOLLEY: It is a complex name. In essence, what that project has been funded to deliver is a feasibility study of the opportunity for load management to be able to be used to manage diesel power station spinning reserve and, therefore, minimise diesel consumption at the power stations – one component.

The second component was the development of quite a sophisticated power station modelling tool which enables us to optimise the size of solar systems according to the configuration of a diesel power station. It also allows us to have a look at the fuel impact of changing spinning reserve parameters might be and those sorts of things.

A third component was the development of a solar/diesel industry handbook. The purpose of that is to provide a communication tool for other utilities to use in communicating with renewal energy proponents; the things that need to be taken into consideration when integrating solar systems with diesel power stations. It includes a number of case studies around projects we have recently implemented, including the Ti Tree/Kalkarindji/Lake Nash project. It is going to be published publicly and is currently being peer reviewed by other utilities and members of industry as well.

That project will be completed at the end of this year, and is when the handbook will be published and what we call the AC Modelling Tool will be made available as well.

Mr CHAIRMAN: Did that involve putting some solar panels out there?

Ms JOLLEY: No, it was purely ...

Mr CHAIRMAN: Because I was going to say I have not seen any.

Ms JOLLEY: Yes. The way we see that project, it is really a first phase project for Daly River. We are only focused to do this feasibility research. When we submitted the proposal we flagged, at the second stage, we would like to take it to the next step and install a high penetration solar system at Daly River and test some of the modelling analysis we have done as part of the first phase. That component actually forms part of the proposal we have now put forward to ARENA, the Australian Renewal Energy Agency, as part of the wider solar roll out program. We are calling it the Northern Territory Solar Energy Transformation Program.

Mr WOOD: High penetration solar arrays; that is the type that shines the sun to the middle?

Ms JOLLEY: The way we use that definition is in the amount of PV capacity. If you think of medium penetration as being the maximum amount of solar PV you could integrate with the diesel power station where you do not need to install energy storage to maintain grid stability, high penetration requires energy storage.

Mr WOOD: Okay, thanks.

Mr CHAIRMAN: I do not know whether this is possible, but for my own benefit and probably these fellows too, Power and Water and you guys are probably the best to do it. Is it possible to get a list of all these acronyms and things that sort of ...

Mr BURGESS: Absolutely.

Mr CHAIRMAN: If that is possible that would be good.

Mr BURGESS: We will get it for you, Mr Chairman.

Mr McCarthy: It is available through a degree at university.

Mr BURGESS: It is a Charles Darwin University refresher course.

Mr WOOD: No, you just start off with the Army.

Mr McCARTHY: Can I ask a question about that? I interpreted it the same as the other Gerry with that definition. Is technology going to bigger and bigger solar farms, or is it going to try to intensify that with smaller units that more ...

Ms JOLLEY: You are asking a question sort of beyond the context of IES, and you are talking about technology development more broadly?

Mr McCARTHY: Yes.

Ms JOLLEY: I think what I would say to that is there are a number of technologies that are still under development and I do not think that there is a convergence yet which has settled on any particular technology. There are different types for different applications, so there are solar systems which still use a concentrating technology and they can come in the form of a sort of modular panels or similar to the solar dish systems that are installed at Hermannsburg, Lajamanu and Yuendumu. Solar systems - the company is continuing to work on that technology, so I think the technology is still under development and there is a whole range of different things which are still being looked at by industry.

Mr McCARTHY: When I looked at the Alice Springs solar farm, what I took notice of was the economies of scale - sheer size. Then we talk about land resources and the infrastructure to support the energy gathering technology. Then it was mentioned here already about the cost of that. Lease payments on Aboriginal land and all these things have to be factored in, no doubt. I wondered whether industry was heading to a more highly concentrated form?

Ms JOLLEY: Yes, like I say, I think it depends on the application and a new project developer would take all of those costs into consideration to determine the most cost-effective technology for that project.

Mr CHAIRMAN: Wadeye?

Mr BAMBER: We have a plan in place to install a gas-fired power station at Wadeye. We are double checking, if you like, with ENI as to whether they can provide a power supply to us to save us building that gas fire power station. This is a question we have got out with ENI. The intention is to install, if ENI do not supply it. Then we will be building a gas-fired power station at Wadeye that would allow us to shut down the usual power station that sits in the middle of town.

Mr CHAIRMAN: Alpururulam?

Mr VATSKALIS: Is that absolutely for Wadeye only, or are you going to extend the power line to Peppimenarti?

Mr BAMBER: There is the potential for us - just for context I will explain. We have shut down five power stations over the last number of years by simply connecting adjacent communities through a power line. That means we do not need a power station, we can shut it, yes.

We have the potential there to run lines to Palumpa and Peppimenarti from Wadeye.

Mr VATSKALIS: The economic analysis, does it make sense?

Mr BAMBER: We had the economic analysis and it does make sense that we could do it.

Mr CHAIRMAN: Alpururulam – wind, solar, diesel?

Ms JOLLEY: The Alpururulam solar, wind, diesel system was commissioned last year and commenced commercial operation at the beginning of this year. So far, it has delivered 318 MWh of renewable energy and has saved 88 000 L of diesel. For limited periods, the system delivers up to 85% of instantaneous power demand by the community, and, over the course of the day, up to 30%. Is there anything else?

Mr WOOD: You said the solar, and I presume the wind, is being built by a private company? You contract power from that company, is that correct?

Ms JOLLEY: The solar system component was built under a 20-year power purchase agreement with renewable energy developer, Epuron. The wind system was also built by Epuron but was built under a design and construct contract and Power and Water owns that wind system which comprises three turbines of 15 each.

Mr WOOD: This might be a silly question, but you said you saved X thousands litres of diesel. Was there a cost in reverse of having to pay a contractor to supply solar power in that process? In other words, you saved this much diesel, but if you had owned the solar panels you would not have the same cost because you are now paying a contractor to do the job for you. I do not know if that makes sense.

Ms JOLLEY: The project received grant funding from the Australian government under the Remote Renewable Generation Program several years ago. The Australian government funding was administered by the Northern Territory government, so the project tender process was run by the Northern Territory government and Power and Water was an advisor. In the way the project was constructed, that was a matter for the program guidelines at the time. Yes, the cost would be different if we had received the funding and built the power station and, therefore, owned it.

However, for any project we are agnostic as to whether it is a third party provider that owns and operates the power system. We look at what will be the most cost-efficient option over the long term. Is it a Power and Water ownership model or is it a third party ownership model? Whether there is grant funding available is also taken into consideration.

Mr WOOD: I am not an agnostic; I know where the sun and the wind came from. When do you believe it will be up and running completely? Do you have a date because you said the wind side of it is still ...

Ms JOLLEY: It is fully operational.

Mr WOOD: You were referring to the wind only operating at night.

Ms JOLLEY: We switch it off during the day currently.

Mr WOOD: You still have a bit more work to do on that, is that what you are saying?

Ms JOLLEY: We are monitoring the system's stability, and once we have confirmed there will not be any issues with operating the wind during the day on top of the solar system as well then we will do that.

Mr WOOD: Just down the road from Alpururulam is Cloncurry. Cloncurry has a scheme - I have not been able to find any more on the website, but obviously money was granted - perhaps Trevor Horman might know a bit about this - it was a solar system - one of the ones that concentrate the sun to a certain spot - there was funding for it then funding was taken away. I did not know whether Power and Water had kept an eye on it as well because it is probably the first type in Australia. Have you looked at it as an alternative for power supply in the Territory?

Mr BAMBER: Where is that?

Mr WOOD: In Cloncurry. There was a project for ..

Mr McCARTHY: Cloncurry in Queensland?

Mr WOOD: Yes, just over the road. Alpururulam is closer ...

Mr McCARTHY: In Queensland.

Mr WOOD: It was a project to look at solar. I do not know if you people have looked at it or kept an eye on whether there was a possibility of producing power.

Mr HORMAN: I am not familiar with the Cloncurry one. At Windorah there are five dishes like we have at Hermannsburg, but we try to keep a close eye on what goes on around the country. Believe me, we get plenty of overtures from vendors of this type of equipment which takes a lot of time to deal with.

Mr WOOD: This was government-funded and I believe the funds were pulled. I did not know if you had been looking at it as an alternative because is it in the same - not in the same area as much, but Alpururulam and Mount Isa are not far away.

Ms LEE: You have to go through Camooweal to get to it - Lake Nash, anyway.

Mr WOOD: I have some documentation on it. I did not know if you had looked at it as an alternative.

Mr McCARTHY: With Alpururulam and the wind side of it, I was briefed it was designed to, hopefully, provide power at night.

Ms JOLLEY: Which is it?

Mr McCARTHY: Yes. At Julalikari and Alpururulam when there would be very low load, then the wind could actually do the job. Can it?

Ms JOLLEY: Up to a certain percentage. There is 45 kW of capacity so, obviously, it will depend on what the load is at those low load times.

Mr McCARTHY: Would the load get down to that in a place like Alpururulam in the middle of winter?

Ms JOLLEY: I am not sure off the top of my head. I would have to get back to you. We would still operate one of the diesel engines, in any case, and have it on line to deal with the wind fluctuations and ensure there is a reliable, stable supply delivered to the community overnight in any case.

Mr McCARTHY: At no time will the diesel ever be offline?

Ms JOLLEY: Yes.

Mr McCARTHY: It is the main backup?

Ms JOLLEY: That is right. That is required for grid stability.

Mr McCARTHY: Yes. In your research and data collection, that is, obviously, very new and providing very valuable research data. Does Power and Water Corporation do that or do you contract that out to researchers?

Ms JOLLEY: In evaluation of the wind system?

Mr McCARTHY: The whole system, the hybrid system?

Ms JOLLEY: We are collecting and monitoring all of that data, yes.

Mr McCARTHY: In the organisation you have some area that does that? I am imagining these scientists in a room ...

Mr CHAIRMAN: In a white coat.

Mr McCARTHY: You are the scientist in the room? Righto.

Ms JOLLEY: We have a team of engineers, including renewable energy engineers. Their expertise is in this area. We have a remote monitoring system that enables us to collect the data, and it is brought back to a database in Darwin. We view that data and look at how the systems are performing.

Mr CHAIRMAN: This is not a criticism, but from my perspective, and not from the answers you have given today, you get this impression there is all this wonderful solar energy, wind, and all that sort of stuff. I gather much of these things are experimental, we are trialling something, or we this on a grant. Is there anything in concrete that says this is what we are going to do in our homelands or some of the smaller ones or something like that? This is the model we are going to put in. We are going to put in solar and a bit of wind or something. Is there anything positive about them?

Ms JOLLEY: Yes. The model is to proceed with a solar/diesel power station design. The challenge is around the capital cost of doing so. That is why we are applying to the Australian Renewable Energy Agency to support us to roll out solar across the Northern Territory. Under our strategy that is what we propose to do. We just need to find a way to fund or finance it.

Mr WOOD: Where does the replacement cost side of it come in? How long will a solar array last? How long will a wind system last, compared, say, to a diesel generator? Do those things come in as well? You might have saved \$Xm worth of diesel, but the replacement cost of the solar system – and I take into account Trevor said the cost is coming down. Do you look at the whole-of-life cost?

Ms JOLLEY: That is exactly what we do. An analysis period is 25 years. I refer to what I mentioned before; there is no replacement of base-load diesel generation. We need to retain that to manage grid stability at those isolated communities. The analysis takes that into consideration; that we need to retain that. For PV modules, commonly there are warranties now provided for 25 years, so we expect to be operating them for that long.

Mr CHAIRMAN: Is there any other alternatives being looked at besides wind, solar, and diesel? Are there any others out there?

Ms JOLLEY: I will refer that to Trevor.

Mr CHAIRMAN: Other than a pedal bike?

Mr HORMAN: Yes. Energy efficiency is the best way to start with. We are investigating every option that comes along. We have talked earlier about geothermal. We will follow that. We have the tidal project that is still cooking. One of the aspects we have not spoken about is biofuels. There is biofuel prospects in the Territory which, early days, one of them is the Indian beech tree or *Pongamia pinnata*. It is not a native plant, but it is naturalised to Australia. Friends in the Department of Primary Production have a forest of them at Middle Point and at Katherine they are testing.

The seeds from this tree can produce 30% to 40% oil. If it can be proven as a viable fuel source, it ticks all the boxes that it is a fourth generation biofuel. It is not a substitute for edible foods, animals are not affected by it, and it might provide some local industry out in the communities. It ticks a lot of boxes. We are particularly pushing that one and are seeking some funding from the Solar Renewable Energy Agency to promote that research. Biodiesel ...

Mr McCARTHY: Trevor is that an arid zone plant?

Mr HORMAN: It is amazing, it will grow in very low rainfalls down to seven inches, but the agronomist finally 'fessed up it grows better if you do give it some water. It is probably more of a Top End thing, but it will grow down to Ti Tree and those places.

We have probably exploited methane gas from landfill sites to the extent they are available. We have a 1 MW generator at Shoal Bay which punches out about 9000 MW hours a year. We just cannot get any more. We just keep pushing them.

Then, the solar hot water systems is another substitute we can unload the diesel power station. Whilst you might think that it is a mature technology, it is not exploited as much as it could be in the communities because of the water quality there. We need to either modify the solar hot water systems to suit the water, or modify the water that goes through them. Every option we can think of we are exploring, including transport of gas out to the communities in either liquid or compressed gas forms.

Mr VATSKALIS: I was going to ask about that, Trevor. They have now developed micro turbines which can be used for one house, 10 houses, or 100 houses, rather than having the big reciprocal - and also diesel is expensive and imported, while gas is domestic; you can either compress it or liquefy it.

Mr HORMAN: Everything is on the table at the moment. The Green Energy Taskforce we referred to came to the same conclusion; that solar at the moment is the one to run with. The beauty of solar, as Megan has pointed out, is it is modular. If a community grows you can quickly add the capacity, or you can transport the capacity away if the community diminishes.

We are also sponsoring a study on solar thermal, which is another solar technology, that comes in big lumps. That is more problematic for us, but we are sponsoring a couple of case studies to look at solar thermal at Alice Springs.

Mr McCARTHY: Trevor, I will qualify this comment. If you have not heard a good rumour in Tennant Creek by 9 am, you go and start one. There was talk about the quality of the gas that is coming out of Mereenie, and a decrease in that quality. Then, that conversation went to an alternative use for that gas; that was, the possibility of some process to collect it and process it, and then use it for remote power stations. Is there any truth in any of that?

Mr HORMAN: Boy, our gas expert has left. The gas that is coming out of Mereenie is wet gas and, as Charles portrayed, has the butanes and the like in it. The concept at Alice Springs is to blend it with drier gas so you get a tolerable product going into our power stations in Alice Springs and Brewer.

However, we already do compress gas to service Yulara, so there could be options to expand that service. There is a gas compression unit at Brewer in Alice Springs.

Mr McCARTHY: You are not necessarily using a poor quality gas, you are using the same gas that produces energy across the rest of the grid, yes?

Mr HORMAN: Yes.

Mr McCARTHY: That yarn went to the reserves depleting. When you get a depleted reserve, you are going to get a poorer quality, therefore, like using the last of the stock.

Mr HORMAN: That is a reasonable portrayal. Yes, these things have a lifetime and they tail off towards the end.

Mr McCARTHY: Is there is an interest in Tennant Creek, by the way, if there are any possibilities to process it there?

Mr BAMBER: We are talking to the gas unit with regard to the potential for supply of compressed gas into the remote communities. We do have to take into account that these are, by definition, remote communities, so we have the issues of safety, transporting gas and then having the gas installed in remote communities. That all has to be taken into account. But we are definitely looking at that as a potential option.

May I also address your earlier question, Mr Higgins, with regard to concrete projects? The ARENA submission is quite advanced. Out of the \$400m ARENA funding they have available, we are seeking up to \$60m for the roll-out of hybrid solar to all of our power stations. They are quite interested. They are in town next Tuesday to visit. That is a reasonably advanced submission.

Mr HIGGINS: When we talk about Indigenous Essential Services, where is the line of responsibility when we talk about growth centres and homelands? Is there a line that defines where your responsibilities start and finish and so forth?

Mr BURGESS: The answer is yes. I have a summary I will read from, that way I will not make a mistake:

IES Pty Ltd in Power and Water is a not-for-profit subsidiary of Power and Water Corporation and it is contracted by the NT government to provide electricity, water, and waste water services to 72 major Indigenous communities, and electricity to 57 outstation communities.

Mr HIGGINS: Is that on top of the 72?

Mr BURGESS: Yes, two majors plus 57 homelands. Under that agreement there are 20 communities defined as major remote towns, and 15 of these are remote service delivery communities. Under the agreement for provisional essential services to the nominated communities, IES gets a fee for service for electricity generation, distribution and retail services, strategic asset and service delivery plan, water and energy efficiency development assessments, asset management, operational budget and data collection reporting.

The operations are funded from \$28m. These are 2012 figures, collected in revenue from the sale of electricity, water and sewerage, and a grant of \$56m from the Northern Territory government through purchaser-provider agreements. That comes from the Department of Community Services, they purchase ...

Ms LEE: Have you got a list of the names of the communities and homelands?

Mr BURGESS: We do, and we will provide you with that list.

Ms LEE: Thank you.

Mr BURGESS: Customers in remote communities pay the uniform tariff for electricity and, as you have heard from time to time, IES supplies and receives grant funding for major projects outside of the agreement; all of the funding we are applying for to ARENA and all the rest of it.

The agreement service level guidelines require IES to supply electricity at defined standards: voltage frequency, variation and reliability. Those things are all set down; we have to meet certain criteria.

IES Pty Ltd owns, operates and maintains 52 diesel-fired power stations with a total capacity of 76 MW; approximately 1320 km of power distribution line, both HV and LV; four solar power stations integrated with diesel power stations, a total capacity of 802 kW and the one wind energy power system with a total capacity of 45 kW at Alpururulam; 11 communities connected to Power and Water Corporation urban gas-fired electricity grids; and IES purchases electricity from third parties for supply to eight communities, including solar power at five communities. In total, eight renewal energy systems supply 11 IES communities. All the 57 homeland communities are connected to the Power and Water urban systems or IES stand-alone systems. Six outstation electricity supply assets are not owned by IES and services are carried out on a cost recovery basis for those. That is the summary, and we can leave you a copy of that if you like.

Mr CHAIRMAN: That would be very good.

Mr WOOD: Are some Indigenous Essential Services outstations or towns connected to the Power and Water grid?

Ms JOLLEY: Yes.

Mr WOOD: Why do they come under Indigenous Essential Services?

Mr BURGESS: It is the way the funding comes through from the government.

Mr WOOD: All right.

Mr McCARTHY: Seven kilometres north of Tennant Creek there is an outstation on the grid yet they are still in the same ...

Mr BURGESS: Yes, they are not gazetted towns.

Mr WOOD: Can I ask about the homelands? Do you do any outstations from the point of view of being totally solar, or is that not your area but Bushlight and other companies?

Mr BURGESS: Jim.

Mr BAMBER: Yes, that is funded through the Department of Community Services. Another 400 communities are funded through the Department of Community Services. It is not our area and is usually through Bushlight, CAT, or similar organisations.

Mr CHAIRMAN: What potential is there for improvement in the user-pays models and decreasing the current Community Services obligations associated with the provision of power in these remote areas? We spoke before on it and you said revenue of 23 and a subsidy of 56, I believe. Is there any potential to do anything there?

Mr BURGESS: Everyone out there pays for electricity at the uniform tariff. There are no electrons not being paid for. If you want to increase the revenue take you have to increase the tariff. That is a question for government on what it wants to do with tariffs.

Mr CHAIRMAN: I wanted to ensure there was only one option.

Mr McCARTHY: What is the definition of a uniform tariff?

Mr BURGESS: I cannot answer that, but I will ask someone who might know. Djuna?

Ms LEE: What about the water?

Mr BURGESS: What is the question specifically?

Ms LEE: In regard to water, do the communities pay for it?

Mr BAMBER: With regard to the water and sewerage services, the recurrent grant from the Department of Community Services funds the provision of water through services to all residents in remote communities. We are entitled to charge water and sewerage services to non-residents. For example, clinics, stores, government housing ...

Ms LEE: Teachers?

Mr BAMBER: Yes, government employees. We are entitled to charge and we do recover it, but it is charged at the uniform tariff. The uniform tariff, which Djuna will answer in a minute, is a tariff that is flat across the Territory regardless of what it costs to generate and provide those services.

Mr WOOD: Are you saying domestic consumers are not metered for water?

Mr BAMBER: We do not have meters on every single house in every community. We have rolled out statistical meters, which are normal meters, to quite a few communities, but we do not have complete coverage. For a number of remote communities we have rolled out smart meters. We are talking about water here. We have rolled out smart meters where, at 15 minute intervals, we can see what the volume is. You can see what is happening at night or during the day.

Mr WOOD: If we are talking about reducing energy, which means reducing pumping - your water comes from electricity but we are not yet charging for water - it has been said before, the best way to reduce consumption of electricity is by a tariff and we have not moved down that path yet?

Mr BAMBER: We have ...

Mr BURGESS: That is a question for government.

Mr WOOD: Yes.

Mr BURGESS: We are contracted by government to provide a service and, under the tariff arrangements government has put in place, that is how it is. We are not the one applying tariffs.

Mr WOOD: Electricity is what people are charged for?

Mr BURGESS: Yes, through the purchase of cards and the rest of it.

Mr WOOD: Okay.

Mr McCARTHY: A uniform tariff is the domestic tariff? Is that ...

Ms POLLARD: Uniform tariff policy is currently in place. Essentially, that means that regardless of location across the Territory, certain customer classes pay the same tariff. That applies for electricity, water, and sewerage charges.

For electricity, domestic customers have a slightly lower volumetric tariff compared to commercial customers. For our larger customers, they are all individually contracted and those prices are done by way of negotiation, so they are not subject to the uniform tariff policy.

Mr McCARTHY: Is a power card purchased in Tennant Creek and a power card that is used at Mungkarta in a meter the same?

Ms POLLARD: Yes, the price of electricity loaded up on both of those cards is the same.

Mr McCARTHY: Right. But would it be cheaper in Mungkarta? The meter spins more in ...

Ms LEE: You have a meter box. Right? When you put the \$20 meter card in the meter box, the electricity that goes through the house is the same as in Tennant Creek. That is what you are trying to say?

Mr McCARTHY: Is the charge the same?

Ms POLLARD: The charge is the same, but what it costs the consumer may differ depending on the individual consumption patterns.

Mr McCARTHY: Sure. But the charge is the same?

Ms POLLARD: Yes.

Mr CHAIRMAN: Can I just go back another one on the water, so I have this right. If the residents in a remote community - if they are Indigenous people and it is their country and all that sort of stuff - their water is paid by a subsidy from community development. Is that right?

Mr BAMBER: From the Department of Community Services.

Mr CHAIRMAN: Community Services? Right. It is not actually billed to the person it is paid for? When we go to, say, teachers who are coming in to teach, those people are charged, and things like the health clinic and so forth?

Mr BAMBER: Yes. We provide bills to the relevant government department for their water and sewerage services consumed by the employees who are stationed on the remote communities.

Mr CHAIRMAN: Okay. We have recovery - we are making money. The member for Nelson's question was if we meter the others and charge an actual cost. I can see what he is saying; you are not going to get any reduction in usage until we charge the people. As Mike said, that is a government policy. I just wanted to get that clear. Do I have it clear in my mind?

Mr BAMBER: Yes.

Ms LEE: Through the Chair, is it the same for providers in the communities now for the department; whoever works in Education etcetera out in the bush. Their service providers are contracted through the government. Is that right? It goes through you, or does it go straight to the government? Then the contractors are sent out there to fix a problem.

With the community houses, what is the difference? Who is it contracted to? Is it contracted to the shires to fix the plumbing in the houses, or ...

Mr BAMBER: I will speak to our agreement. Our agreement is for everything outside the houses, or the house lot boundary, if you like. We are not contracted to maintain services inside the houses or even in the lot. We will [inaudible] normally at the metre.

Mr BASKERVILLE: Remote housing, through the Department of Housing.

Ms LEE: So that is who it is?

Mr BASKERVILLE: That is where it sits.

Ms LEE: Plumbing and so forth for houses in the communities are under remote housing?

Mr BASKERVILLE: On water again, we are in discussion with the Department of Housing about water charges.

Mr CHAIRMAN: I suppose reason for our question is, as the member for Nelson said, it costs - when you go out to a lot of these communities there is water, water everywhere.

Mr BASKERVILLE: The other thing is that part of SIHIP there were many metres rolled out for refurbished houses. We put a meter on the block.

Mr McCARTHY: Jim, when you talk about a smart meter, is that like the meter on the new Ali Curung water treatment plant that gives you the overall picture ...

Mr BAMBER: Yes, it is.

Mr McCARTHY: ... of the place, not any one individual?

Mr BAMBER: No, we have both. We have smart meters that measure the production, the volume into the community. In Ali Curung we have installed smart meters on some non-residential lots, and in Santa Teresa, Milingimbi and Gunbalanya on every lot. This is where we are working with other government agencies to look at the impact of demand management. We do leak reduction and demand management education with the community, and you can actually see the impact of what you are trying on a house-by-house basis including what happens during the night when there is virtually no usage. We are seeing this, not minute by minute, but by 15 minute intervals so we can see what is happening during the day and during the night.

Mr McCARTHY: Physically, are they located on the dwelling. They are not like a traditional water meter?

Mr BAMBER: They are located at the dwelling, somewhere on the pipe into the dwelling.

Mr McCARTHY: I will go looking for one now.

Mr WOOD: A question about alternative energy sources - and there has been a lot of talk about fracking at the present time. There is a bit of the Northern Territory involved in unconventional and gas exploration. Has that potential supply of gas got any possible spin-off support for remote communities?

Mr BURGESS: I will have a go at answering it. To the extent, assuming that there is an underground gas resource that is proven up and is brought to market, so you have actually got some wells dug and it is producing gas, some of those basins are fairly close to a number of Indigenous communities. If it was possible to aggregate sufficient load, you might be able to build

one power station gas fired to power a number of communities and that might be more economic than having distributed diesel assets over a whole lot of small places. To that extent, you would have to think that there might be some potential but it would be very location specific. Where is the nearest pipeline and who is living near it? Basically.

Mr WOOD: I raise it because the minister has spoken about some enormous possible re-services of this gas. There have been a number at Beetaloo and, I think, the Georgina Basin and there have been some other sites that have been mentioned. I just thought that it might have some potential by the way it has been spoken up about at the present time.

Mr McCARTHY: You put it into context Mike, in five to 10 years of exploration and shoring up these reserves. Essentially, I hope that if it is all proven, it would have the possibility of creating pipeline grids. Explorers tell me that that is a possibility.

Mr BURGESS: That would be a great outcome for the Territory because once you have got the pipelines there you have got more than one person to pay for the capacity which reduces the transport costs, makes the product cheaper, and enables more people to take it up. So pipelines are important.

Mr WOOD: Just while we are talking gas again there is a debate about - two sides who say unconventional gas exploration. One is the so-called a cleaner form of fossil fuel but on the other side is the argument we are still producing more greenhouse gas omission. In this debate about future energy sources, are we burying our head in the sand in the future by saying, 'Well we have got all this gas', but could it be that government comes along and says to you, 'Well you cannot have any more gas omissions, you will have to go and find some other sources of energy because the world is warming'. I know we have said down the path that in another 30 years we are going to have this gas but what will happen if there was a requirement to reduce our greenhouse gas emissions? Where would we go?

Mr BURGESS: I think there is great opportunity for the other technologies to stand on their own two feet. The work that was done a couple of years ago indicated there is going to be a sweet spot that we are going to hit, maybe in a decade's time, where these things can be truly competitive in their own right. At that point, the community might be more than willing to bear that slightly marginal extra cost that it will take to actually introduce these things on a wide scale. Having said that, I believe what we will see in the future is a blend of technology supporting any one grid to manage reliability, and to manage the ability to allow others to come onto the grid and off the grid as their technology works and does not work. There will always be a need to have a stable generating capacity and gas is not a bad one for that.

Mr WOOD: Before we go down that path, will there be studies to show what the whole-of-life greenhouse gas emissions produced by this new technology are compared to technologies, specifically solar? I am not against solar, but there is obviously a cost to producing solar and batteries with lithium and ...

Mr VATSKALIS: That has already been done, Gerry. There has been a whole-of-life analysis of different means of producing energy. Solar is not very cheap; it is very expensive.

Mr WOOD: As a committee, when we recommend something we need to ensure we do not recommend something which could make the planet worse off if we go down that path rather than being better off.

Mr BURGESS: I am sure there are many people out there more than happy to advise you where the costs are going and how they can help mitigate that.

Ms LEE: My question is about management strategies you have planned for the communities or, into the future, what you are looking at introducing. It goes back to literacy based with the community members. How are you going to educate them about this type of structure?

Mr BURGESS: I believe the primary responsibility to educate people who live on communities is the value of the resource and how they can manage it. The basic work we are doing about use of water needs to extent on a broader scale to the use of electricity so going forward it is not just a black hole people are walking into, things do not become more expensive, it can stabilise demand and people take more control over their own costs. That gives people who supply power a greater ability to have certainty of these things. It gives greater ability for people to walk in with small home-based solutions which might be renewable solutions ...

Ms LEE: What solutions are you looking at? How will you inform residents of the communities? The cards that were given out to put in meter boxes were not effective. I had to visit some of my communities to explain what was happening ...

Mr BURGESS: Megan might be able to explain it better.

Ms LEE: ... an interpreter who goes around to talk to people about this kind of thing.

Mr BURGESS: Megan, if you could expand on what you said before.

Ms JOLLEY: The model we are trialling under the low energy efficiency program being implemented in East Arnhem is one where there is a community-based efficiency educator who is trained up under the program and is then a resource available to community members to advise on measures and things they might do within their house to manage their own energy budgets. We will be looking at the effectiveness of that model over the course of the program, and seeing if it is something we can implement in other locations going forward.

Mr McCARTHY: Are there any efficiencies in underground power and aerals - the traditional power line?

Mr HORMAN: The capital cost is enormous - up to 10 times the cost of underground power mains. There has been a program in recent years to underground the seaside suburbs, and the cost was more than 10 times when going into an old suburb trying to do that type of exercise. In benefits, you eliminate some of the short-term faults - the bird faults, lightning, and that type of thing, but when you have a serious cable fault it takes a long time to fix. There is a trade-off between the numbers of faults versus the duration of the big one you are hit with.

In regard to revenue, there is no difference in the revenue the utility gets. Customers are still using it so it is really an aesthetic issue in most instances. Because most people would prefer it, in all new subdivisions the developer puts the underground service in, and the seaside suburbs in Darwin have now been done. In the remote communities it would be a negative. You need the biggest bang for your buck in those communities. That is icing on the cake, but you would not go down that road.

Mr McCARTHY: Retrofitting, I understand, is very expensive. It is good to see the new suburbs with undergrounding. I was not aware of that problem about maintenance. Is there anything in the science of transmission? Are there any efficiencies there?

Mr HORMAN: No, we design the capacity of the systems depending on the load that is going to be on the system. For instance, in a new development like Weddell, whatever happens we will assume it is 4 kVA per residence and do the design on that basis, whether it is overhead or underground.

Mr BAMBER: I can update on the water and energy efficiency programs we have. We have water energy efficiency projects of various scales under way on six communities including Gunbalanya, Robinson River, Epenarra, Kintore, and Yuelamu. Then, with that leap program we are targeting those additional six communities in East Arnhem. The communities we are targeting there are Galiwinku, Gapuwiyak, Milingimbi, Yirrkala, Garrawanga and Ramingining.

We have already been working on water and energy efficiency in the communities, and working with the communities.

Mr CHAIRMAN: Okay. Thanks for that.

Mr WOOD: I have a question about essential services.

Mr CHAIRMAN: One more, member for Nelson.

Mr WOOD: Okay. This one is one out of left field, but I cannot leave it go. We produce uranium in the Northern Territory and I know people say nuclear power is off the agenda, but it is like many things, technology advances, technology changes, otherwise we would not be driving cars today in a safe condition.

Are there any new processes people might have heard, or advances in nuclear technology that may be one day applicable to the Northern Territory? As the member for Barkly said, we have ships and submarines that go around with very small nuclear power plants. We send Viking 1 and Viking 2 off to the far end of the solar system on a nuclear powered plant. Do you, regardless of the politics of it, keep an eye on that sort of technology and see where it is going?

Mr HORMAN: Member for Nelson, I will have a go. There are new reactor technologies coming along in South Africa. They have produced the pebble reactor that is heading in the direction ...

Mr WOOD: Thorium.

Mr HORMAN: Yes. They are getting smaller. A few years ago, you would not look at anything less than 1000 MW, but the size is coming down. The only other comment I make is Professor Ross Garnaut, a couple of years ago, commented on the issue that if you are shipping energy around the world, then shipping uranium oxide to Japan is a much better proposition than shipping LNG as we are doing at the moment.

His argument would be that Australia would never find it economic to go down the nuclear road. If you have got the uranium, you ship it to where it is needed, and you use the gas here. That is all I can comment.

Mr WOOD: Thanks for that.

Mr CHAIRMAN: Thanks, everyone, for coming. What I think is going to happen is you will be back. This stage is just to find out where everything sits at the moment and get some ideas. Eventually, we will be asking what other potentials are there and so forth. But, thank you very much. Anything else you would like to say to us before I close?

Mr BASKERVILLE: No, good exercise.

Mr BAMBER: No.

Mr CHAIRMAN: Okay, thank you.

Mr VATSKALIS: Thanks very much.