



LEGISLATIVE ASSEMBLY OF THE NORTHERN TERRITORY

12th Assembly

Committee on the Northern Territory's Energy Future

Public Hearing Transcript

9.15 am – 10.00 am, Friday, 14 February 2014

Litchfield Room, Level 3, Parliament House

Mr Gary Higgins, MLA, Chair, Member for Daly

Mr Kon Vatskalis, MLA, Deputy Chair, Member for Casuarina

Members: Mr Gerry McCarthy, MLA, Member for Barkly

Mr Gerry Wood, MLA, Member for Nelson

Mr Francis Kurrupuwu, MLA, Member for Arafura

Witnesses: Mr Alan Major: Managing Director, Tenax Energy Pty Ltd

Mr CHAIR: On behalf of the committee, I again welcome everyone to this public hearing into the challenges and opportunities associated with meeting the Northern Territory's energy needs. I welcome Mr Alan Major, Managing Director from Tenax Energy, to the table to give evidence

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 hearing and is being webcast through the Assembly's website for transcripts to 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 closed session and take your evidence in private.

I will ask you to state your name for the record and the capacity in which you appear. I will then ask you to make a brief opening statement before we proceed to committee questions.

Alan, could you please state your name and capacity in which you appear.

Mr MAJOR: My name is Alan Major and, as stated, I am Managing Director of Tenax Energy Pty Ltd. Tenax Energy is a Darwin company established to be actively involved in initiating new renewable energy generation systems to ensure there is a cheaper and more sustainable solution to meeting the long-term energy needs of the community. The company is identifying, packaging and developing tidal energy generation projects across Australia and the Asia Pacific region.

The first tidal energy generation project to commence is secured by a licence to occupy 16.8 km² of the Clarence Strait, 45 km north of Darwin. The project is the first of its kind in Australia, and globally will be the first tidal energy facility in a tropical environment.

Tenax Energy has a Memorandum of Understanding with the Research Institute for the Environment and Livelihoods based at Charles Darwin University to facilitate the establishment of a world-class commercially oriented tidal energy research and testing facility to be known as the Tropical Tidal Testing Centre, or T3C, with an aim to stimulate collaboration across research institutions, device manufacturers, project developers, renewable energy markets and ancillary services. The T3C has also secured a Memorandum of Understanding with the European Marine Energy Centre, the world's preeminent ocean research centre based in the Orkney Islands in Scotland. Two Australian companies have signed on to trial commercial scale technology here when the pilot project is operational.

We are leveraging our learning outcomes to contribute to a project in the Kimberley region, and using what we learn in Clarence Strait in opportunities in the Asia Pacific region. We have received a primary grant from CAESIE, which is Connecting Australian European Science and Innovation Excellence, to support meetings in Europe to garner interest and establish relationships with researchers.

I will be travelling to Scotland, France and Ireland in April to meet with marine energy research facilities that are funded by the European Commission through Horizon 2020, which last week reiterated support for the sector with an additional commitment through to 2017.

At the moment, if you are developing a tidal resource or technology or have capacity constraints in the technology, you get free access to testing centres throughout Europe including travel, accommodation, access to science, researchers, but you basically have to be based in the European Union. We are looking at leveraging some of those opportunities.

Other areas of interest are in Chile and the Philippines, and we have recently bid for work in Papua New Guinea, Tonga and Indonesia.

I am pleased to note the Northern Territory government continues to make a commitment to and encourage the development of a strong and viable energy industry and is looking seriously into initiatives to promote the uptake of emergent energy technologies.

Our submission to this committee is focused on some of the unintended consequences of policy, and of the political debate in recent years, which continues to starve sections of the Australian electricity generation sector of necessary investment capital.

By global standards the Northern Territory has a large pool of energy potential, particularly from renewable resources and embedded in fossil fuels offshore, that is available to drive innovation and new export industries. Power and Water Corporation has a reputation for providing effective solutions to powering remote Indigenous communities and the Northern Territory has seen great innovation occur as a result of the need to bring electricity to these areas.

This has had implications on a global scale. PowerCorp is a prime example, so is the Centre for Appropriate Technologies, and I hope Tenax Energy will be in the future.

The Territory has secured a gas supply contracted to Power and Water Corporation which will provide the bulk of electricity generation on the Darwin/Katherine Integrated System for the next 25 years. However, I bring your attention to Queensland government owned Stanwell Corporation which announced in the last week that the gas-fired Swanbank E Power Station west of Brisbane will close for three years because it has become more lucrative to sell the gas than to burn it and sell electricity. Swanbank E is described in the Fairfax media as one of the most efficient and advanced gas-fired power stations in Australia. The supply will be covered, in part, by reopening a coal generator at Tarong.

I mention this because of unintended consequences. Output at Tarong was severely cut back during the drought in 2007 as there was insufficient water supplies to convert to steam and drive turbines. This pushed electricity prices up in Queensland by over 50%.

Our written submission to the committee provided, I hope, a fairly frank overview of some of the contributions Lord Stern has made by way of a risk assessment of the global energy and the climate change debates. I do not intend to rehash or re-prosecute our submission but offer an observation.

The current energy policy in the United Kingdom, which is closely tied to their climate change industry, and trade and employment policies is very strong on support structures for emerging technologies. These policy drivers provide a clear direction for innovation in the energy industry and finance sectors, have facilitated billion pound investments in the renewal sector, and have encouraged the surge in employment underpinned by the sector.

Most of the current energy policy in the United Kingdom was enacted by the Labour government, but the policy was, in fact, written by the Tory Party in opposition. The Shadow Minister for Environment, Peter Ainsworth, said at the time:

We cannot expect to meet the challenges of this century by toying with the structures and technologies we have inherited from the past, and the concept of decentralised energy should be taken seriously.

Both parties recognised the UK's energy future in a carbon constrained world had to be a bipartisan approach.

Whilst I do not necessarily agree with using a UK-style contract for difference or fee and tariff as a means to pull technology through the innovation path, for the UK it has been, and still is, a valuable tool in their arsenal. Ireland joins UK and Scotland in developing a feed and base pull methodology, while Canada and Chile are pushing investment into the marine energy sector.

The science tells us that the existing energy supply system and the demand side implications is a problem of risk management on an immense scale. The science tells us there is a problem that will be politically very difficult. Understanding these implications is key to thinking about the economics, the ethics, the policy responses, and the political economy.

Policies with sustainable development require breaking the link between production and consumption activities on the one hand, and omissions on the other. This will be very difficult in an extraction-based economy.

I take this opportunity to visit a noteworthy news item from the past couple of weeks which may be of relevance to these hearings. From *RenewEconomy* on 30 January, the Western Australian South West Integrated System grid was identified as being in danger of a death spiral as solar rooftop PV installations suddenly started to have an impact on the grid. While a significantly larger grid than the Darwin/Katherine Integrated System, the implications of between 2000 and 2500 customers a month installing rooftop PV has startling implications - more than 31 000 customers last year. The message is there is a price point at which unsubsidised renewable energy - in this case solar PV - just makes sense.

The SWIS - the South Western Integrated System - is seeing a 10% drop in demand in two years. The National Electricity Market is experiencing that drop in demand year on year. The corporate plan for Power and Water Corporation is to plan for a 2% year-on-year increase in demand.

The Northern Territory already has the highest uptake of rooftop solar hot water in Australia, and it could be suggested that is globally. Conversely, the Territory has the lowest uptake in rooftop solar PV. When - not if - domestic storage becomes price competitive either through advances in battery technology or electric vehicles, one would hope Power and Water Corporation has built a new business model based on a new utility paradigm.

The Northern Territory is a land of opportunity in which the national government appears to be giving mixed messages. While scaling back on innovation opportunity the Territory is, by necessity, attracting innovation and building opportunity.

Thank you for your time.

Mr CHAIR: Thank you. In your submission you mentioned you have a memorandum of understanding with Power and Water to build a 2 MW tidal energy plant. Can you give us some indication about the potential environmental impacts of tidal energy facilities with the agreement? What sort of anticipated power generation do you see coming out of Clarence Strait, and is there an implementation time frame associated with that?

Mr MAJOR: Certainly. The Memorandum of Understanding we have with Power and Water Corporation is to recognise that in the Northern Territory they are the primary off take partner. From that perspective we need to negotiate a grid connection agreement and a power purchase agreement with Power and Water. The intention is to use a pilot in the Clarence Strait project. The initial pilot project is to build on the global body of knowledge on the environmental effects of tidal technologies, understanding the technologies and industry, at the moment, is flourishing in the north of Europe and north of Canada.

This will be the first of its kind in a tropical environment. A technology designed to operate in a 2^o to 7^o ambient temperature, what will it be like in 28^o ambient temperature, particularly water cooled generators. They are looking at seals and whales interacting with turbines; we need to look at crocodiles and turtles. We need to look at what different biota will grow on steel and composite structures at 40 m depth in the Territory. They have 100 days a year where they cannot put a boat in the water to service their equipment. We will probably have one to two weeks a year when cyclonic conditions are near the Territory coast.

In Canada they have boulder waves. Sand waves you get around Central Australia from the wind action - you get the same with sand waves. In Canada they get boulders the size of VWs in 10 m or 20 m waves. It is a very harsh environment.

The pilot project is designed to contribute to that as well as provide us with the opportunity to go through the environmental approvals process and an adaptive management process.

Mr McCARTHY: Alan, where is Clarence Strait?

Mr WOOD: It is in my electorate.

Mr MAJOR: It is in Mr Wood's electorate. If you go to Gunn Point and look north towards Melville Island, that is Clarence Strait.

Mr McCARTHY: In regard to this infrastructure, you would be building from point to point or from land mass to land mass?

Mr MAJOR: No, we have approached the Territory government for a licence for 16.8 km² in that area considering it is around 25 km across. It has the Vernon Islands in there. There are three channels – the South, the Howard Channel and the North Channel. Within those three areas we are looking at around six discrete sites which are deeper than 20 m and have velocities in excess of 2 m per second. The initial proposal was to connect into the infrastructure corridor proposed for Glyde Point and, on a shorter term prospect, the intention is to look at the existing power line Power and Water has out to Gunn Point, which is 7 km from shore.

Mr McCARTHY: The technology is submerged? It is not like dam technology?

Mr MAJOR: No. If you imagine a wind turbine sitting 20-40 m below the sea - you cannot see it but you can still traverse through the channel. Currently prawn fishing is not allowed in Clarence Strait so that is not an issue. We

have been talking to AFANT about ensuring we do not site a turbine too close to one of their favourite fishing spots.

Mr CHAIR: I know we are talking about renewable energy so there is that side of it, but what about the actual costs of implementing this sort of technology, say compared to gas? How do the prices compare?

Mr MAJOR: That is the key criteria: economics. If you do not have an economic project, you do not have a project. In the current environment expecting government handouts to subsidise a project is not going to happen.

We have our target price for generation, what we think will be a commercially viable project, which will vary from site to site and from country to country. On a site specific, that varies because of the energy in the area, what the velocity of the water is. And country to country, it depends on what the support structures are available. As I said in my submission earlier, in Australia at the moment there is a concerted effort to pull back from innovation and industry development, whereas in Chile, for example, they are working with the Inter-American Development Bank to promote not only tidal and wave energies, but solar etcetera. They want to establish Chile as an international centre of excellence for renewable energy in Central and South America. Australian companies are at the forefront of working there. They are not using a feed-in tariff to do that, they are using different types of support structures to push the technologies and the industry, and get the resultant investment in jobs and cheaper electricity in the long term.

Mr CHAIR: Like solar with night and day, with tidal is there a period where there is no energy being produced?

Mr MAJOR: In the Northern Territory, certainly, you might see your tides pushed down to one end of the month. So, in some periods there is an 8 m tide fall, and in other times during the month there is a zero tide fall.

The reason there is an extractable energy supply in Clarence Strait is because, at one end you have the Beagle Gulf and at the other you have the Van Diemen Gulf, and there is a variance in the tides between the two. While one is at full tide, the other one is not quite there, and it pushes and amplifies the currents going through there. Anyone who has been fishing or sailing through Clarence Strait who has whizzed through at eight knots knows just how energetic those tides can be.

We are not replacing generation in the grid; we are providing an additional low carbon alternative to what is currently being supplied in the Northern Territory.

Mr McCARTHY: You will be faced with the same challenges as the solar industry, with peak demand and peak load and infrastructure challenges as a transmission?

Mr MAJOR: Not as so, because one key aspect of the tidal regime is that you know what it is going to be doing in 25 years time. When you have an accurate picture of what the tide is doing, you have an accurate picture of what a tidal turbine can do in the water column, then you can talk to Power and Water and they can program their generation profile months, even years, ahead based on a simple algorithm.

That being said, as I mentioned earlier, one of the holy grails in the energy system - it does not matter whether it is fossil fuel or renewable systems - is energy storage. You have greater minds than mine applying their thought processes to that. Elon Musk, the inventor of the Tesla car in America, is also providing solar storage facilities to households in California at a reasonable price. Every major battery manufacturer in the world - Siemens, ABB - are all applying their minds to that and it will eventuate relatively soon, I envisage.

Mr WOOD: Can I just ask a couple of questions? I get excited about the area of hydrogen - not because it is in my electorate, but I think it has a lot of potential, maybe even the technology for communities that are around the coast. One of the problems with developing hydrogen, which I think will be the future fuel for cars rather than just electric cars, is the production of hydrogen which takes a fair bit of energy. Would you see it as a possibility that your kind of energy, with which it would not matter so much if there was a gap where there was a slow-down and then speed up because of the tides, could be used for the production of another energy source, like hydrogen? This could then be stored and used to run vehicles. In other words, you are not part of electricity production; you are part of production which is able to be used for some other source of energy to produce it.

Mr MAJOR: That is a good question and very valid to the Clarence Strait. If we were to develop all 16.8 km² of our site we have conservatively estimated that to be around 450 MW. In Europe at the moment they are proposing 200 MW goes on 1 km² so there is a huge surplus within Clarence Strait for potential future energy.

Mr WOOD: How does that compare with what we produce at the moment for the Territory in megawatts?

Mr MAJOR: At full production and full development we are suggesting with Power and Water that Clarence Strait would be ultimately suited to around 100 MW. That is a quarter of what the resource potentially has available. We are looking at the potential for hydrogen generation and globally hydrogen producers about the price points, the pressure points, and what the opportunities are considering in America they are rolling out charging stations for electric cars and in Europe they are rolling out hydrogen refilling stations for hydrogen cars. There is a lot of investment going on globally.

From the Territory's perspective we have the resource and patience and we can tie the two together when it reaches the right price point.

Mr WOOD: The other question is siting. The government has brought out the greater Darwin plan and part of that is to reintroduce a port at Glyde Point. Are there any complications in relation to your plant siting and a port?

Mr MAJOR: No, we also proposed a project in Port Phillip Heads in Victoria where they have just dredged to 17.6 m to allow the supper container ships access to port facilities and the Yarra. It would be a bit remiss of us to put a turbine in there shallower than 17.6 m.

The areas we are interested in in Clarence Strait are deeper than 20 m through to 40 m, and in some areas 60 m. The intention is to not impede passage through the channels of Clarence Strait but to extract energy while activity still continues around us.

It is worth noting we have been engaged by an Indigenous community in Western Australia sitting at the doorstep of one of the great tidal resources in the globe. We have been contracted by them to do a resource assessment and provide a pathway to development for them. They have a community of 500 people who rely on diesel generation and Horizon Power is offering \$500 per megawatt hour for feed and tariff for renewables, be that solar, tidal or whatever, which is an indication of what the cost of diesel generation in remote communities is like.

We have also been approached to look at projects in Papua New Guinea where they are using diesel. Australian companies are getting aid funding to install desalination plants at a community scale adjacent to significant tidal resources. However, when you price a project and a diesel generation set is worth virtually nothing, but then you burden the community with diesel costs and diesel storage implications for the next 25 years, where a cost benefit analysis would show that an alternative power source can provide a cheaper solution over 25 years. That is where we see the Northern Territory, and what we learn from Clarence Strait, as being an important factor and able to export that expertise in the Asia Pacific Region.

Mr WOOD: The life of your generator compared to the life of a generator above water - is there any comparison? It is obviously easier to maintain on the ground rather than in salt water, but do you think you will end up having modules to replace part of your generating plant when it gets too old? You drop it in and away you go or will it require ongoing maintenance? How will it work over time? Will it be a costly job to produce electricity under water?

Mr MAJOR: The first aspect is the fuel is free and will remain free for the life of the project. That ongoing fuel cost and escalation of fuel costs over 25 years or 50 years is not a factor in the commercial tidal energy project. The two key aspects are the capital cost to construct, and the ongoing operations and maintenance in a very harsh environment.

If you look at who is industrialising the technology at the moment, globally, it is DCNS, which is a French company that builds nuclear submarines for the French government, Siemens, Voith, Andritz - all the big electricity generator OEMs have all bought technologies in the tidal energy sector and are industrialising that technology with the support of their governments. A key component of a commercially viable tidal energy project is going to be what the ongoing cost is to maintain. Each technology has its own variation on a theme for swapping out the turbines for looking after, either at sea or ashore.

One of the key components from a Territory perspective is there is a developing supply chain that will be associated with this technology in this industry. In Canada, their support structures for the industry are tailored towards developing a foothold in that supply industry, that supply chain, and they want to have 50% of that supply chain by the end of 2050.

If you do a back-of-the-envelope calculation on the tidal resources in the Asia Pacific region and what an O&M regime might look like and how you would factor in the costs for that, you could suggest that annual revenues for an O&M contractor is between \$1bn and \$2bn a year. That drives their industry policy in Canada.

I believe the Northern Territory has the opportunity here to look at what the future of the resource is and what can be leveraged out of that resource through learnings at CDU and associating the innovation in a tropical environment with research facilities around the world.

Mr WOOD: Could I ask a political question? Do you think the carbon tax was a good idea and that money should, perhaps, go into development of your sorts of energy? You do not have to answer that, but you were saying at the beginning that other countries' government and are obviously putting money into your type of development, and Australia is moving away from that. Yet, you are giving us a good reason why we should be investing, I thought.

Mr MAJOR: Probably a better way to reframe it is that ideology should not drive policy. Ideology is great to have around a kitchen table, but when you are looking at a national or a Territory based GDP, it has no place.

We are in a competitive environment. You have had the oil and gas industry here this morning saying they are in a competitive environment. Our competitors are Germany, France, Canada, the UK, and Chile which is prepared to put tens or hundreds of millions of dollars into renewable energy. They have fantastic supplies of renewable energy, and so has the Northern Territory. However, they want to innovate, and be the leaders of innovation in clean energy and emergent technologies in the South American region, and they are investing in it.

Australia has, at this point in time, the policy structures to support that type of innovation, but in the electricity sector no one has been investing, other than the Northern Territory which has a confined and constrained marketplace. Certainly, on the national electricity market, nothing has been seriously built in the electricity sector now for eight or 10 years. I cannot foresee any bank supporting a major electricity infrastructure for another decade under the current policy settings, because it just does not match the reality in the real world.

Mr CHAIR: Based on that and your experience with this, what sort of policy initiatives, investment incentives, or regulatory considerations do you see as having the potential to encourage renewable energy project developments in the Territory?

Mr MAJOR: The Northern Territory has shown value adds in the past, as I mentioned with PowerCorp. There is SRA Information Technology, Envirosys solutions.

There are companies in the Northern Territory that are doing globally significant work in this sector. At the moment it tends to be ad hoc. The infrastructure exists in the Northern Territory through CDU and CAT in Alice Springs. That is where I see significant opportunity to link those programs into. The Horizon 2020 I mentioned earlier I am funded to go to Europe for is funding three key strains in Europe at the moment: sustainable populations, life sciences and clean energy. That is two billion Euros a year into clean energy out to 2020.

The UK government has recommitted to innovation in clean energy. Ireland last week committed another 20 million Euros to ocean energy innovation. It does not have to be monetary, but it should be supporting the innovation industries the Northern Territory has the potential to build considering the learning that goes on in the Northern Territory because we have to supply electricity to remote areas and supply electricity in an environment where diesel is very expensive to get to the community and purchased to begin with.

There are so many opportunities that need to be exploited, can be exploited and will be, but it has to be in tandem with industry and government.

Mr CHAIR: If I come back to my earlier question, one thing still in the back of my mind - I know renewable energies have a benefit but the cost. I am not asking exact dollars, but when we talk about putting a tidal generation system in somewhere and we cost it over 25 years, how do those costs compare to coal? Is coal half the price? Will tidal energy be cheaper? I know it will not be, but how do we compare that? Government always has to look at how much money it has and, for people living in houses, how much money can they spend on electricity. Renewables, if they cost 100 times what we have now you wonder if we can afford it.

Mr MAJOR: It is a valid and interesting question to come in the Northern Territory - looking at coal generation. You have opened the door and I am quite happy to walk through that. The world's electricity infrastructure was built by government's generations ago and we are paying the price for that legacy now. The price is how to innovate when you have legacy companies and legacy industries that do not want to innovate and are quite happy with their business model. Solar is a challenge to that business model. As I mentioned, if Power and Water do not innovate their business model and get ahead of the curve then the investment the Northern Territory government has made in Power and Water will be written down to junk status.

Coal, as a generation source, was provided by governments at subsidised cost to producers and is still being subsidised in Australia to the tune of \$2bn a year. We, as a renewal industry, are being lauded as trying to suckle

at the government's test for asking for subsidies a fraction of what the mining and coal industries get. What we would rather is coal and mining have their subsidies reduced to zero and have a level playing field and look at cost of production.

The electricity market in Europe at the moment is based on the cost of production as opposed to the life of the generation plant. Places like Denmark and Germany are producing better than 50% of their energy from renewables at the moment because those fuel costs are zero.

As I said earlier, you will not build a commercially viable plant unless the technology is at a cost which makes it viable. That is the challenge for the industry, the challenge for the governments, and the challenge for innovation is getting those costs down. It does not happen in isolation, it happens at scale. When you start building at megawatt scale, then hundreds of megawatts and then at gigawatt scale those prices come down rapidly and the prime example is solar where, less than a decade ago, to say you could have a utility scale solar project built in America, let alone in Australia, would be a fallacy. At the moment they are rolling out gigawatts of solar in California and Arizona. As we speak, they are commissioning gigawatt scale plants in those areas. So, every technology has a price trajectory that brings it down through innovation and through scale, and we expect tidal energy will be the same.

Mr McCARTHY: Alan, you talk about ideology. In 1989-90 I founded two schools in the Nicholson River region fully solar-powered, with solar power battery storage inverted to 240 V. Yet, the pastoral community around northeast Barkly's ideology was how much it cost. When I told them it cost \$220 000 to do both projects for the power they basically said, 'Well, that is a lot of diesel, mate.' There is a lot of ideology still in this debate.

Mr VATSKALIS: I listened to what you say, Alan, and I agree with you. But, the reality is if we are going to go down that way it is better to build a nuclear power station. It will last for 40 years at least, or 50 years, and produce massive amounts of energy which, when you subdivide it, becomes really cheaper than coal. But, the thing again is ideology comes in the way, so the Australian government of either persuasion just said, 'No, we are not going to do it,' because they are afraid of the political cost. What is the amount of energy that your project can put on the grid in the Territory?

Mr MAJOR: We are projecting to meet the demands of the grid on the Darwin/Katherine integrated system; that we would cap our generation potential at 100 MW. The reason ...

Mr VATSKALIS: But it has the potential to go further?

Mr MAJOR: Sorry?

Mr VATSKALIS: It has the potential to add on?

Mr MAJOR: That would be a quarter of the potential of the site at this point. As the technology's innovation increases it could, potentially, be a tenth of the energy available on that site. As mentioned to Mr Wood, the opportunity then comes for energy storage and transfer as those technologies develop.

Mr VATSKALIS: That is the biggest problem with the renewable energy. It produces a certain period of time. The storage is not there yet unless you have some really innovative ways of storing, like the sea swap - pumping water up in a lake and have it run down again - with a hybrid nuclear and hydroelectric?

Mr MAJOR: If I could just make a comment on nuclear, because we have been talking about ideology?

Mr VATSKALIS: Yes.

Mr MAJOR: I do not want to be the spokesman for the environmental groups which are following me later in the day, but certainly if you look at the USA experiment and the UK at the moment, UK is offering the French nine times the cost of electricity to subsidise the construction of a much-needed nuclear plant because all of the nuclear facilities in the UK are reaching the end of their usable life. That is not enough for the French to build it.

The Americans have not commissioned a nuclear plant since Three Mile Island, and that is despite offering anyone in that industry \$2bn up-front just to propose the construction of a nuclear plant.

Australia has a long way and should be very patient and watch what goes on in the rest of the world over the coming generations before we start committing to a nuclear path in Australia. When you have the price trajectory of solar and the opportunity for 2000 households in Darwin to hook into solar panels - and that is the pent-up

demand in Darwin at the moment. That is not the potential marketplace, that is just the pent-up demand - you would not need to build a power plant in the Northern Territory until 2030.

Mr VATSKALIS: I agree with you, but there are two issues you brought up: one is subsidy and the other is the poor infrastructure. Currently, there is a limitation on how much power you can put in your house because the infrastructure in Darwin cannot take it. The other thing, of course, is how many people really would put a solar plant on their house if they did not get any subsidy? It comes down to that too ...

Mr MAJOR: Mr Vatskalis, if I can make a prediction? That is, if Power and Water puts the 11% increase on the power price in the coming years to pay for the much-needed infrastructure upgrades they need, and if they put the price up to meet increasing gas costs as they have to in the coming years, and subsidise the diesel generation they do in other parts of the Territory, it will be like Western Australia. There will be a tipping point where the population says, 'It is cheaper for me to pay \$8000 to get solar panels on my roof than it is to pay Power and Water for electricity over the period'.

Mr VATSKALIS: They have just increased power prices by 30% and another 5% this year, and they will increase it by 5% every year so people already. The problem is Power and Water will not let people put big panels on their roof because our system cannot take the energy generated by those panels.

We have a chicken and egg situation here. Power and Water is not prepared to spend the money to upgrade the infrastructure and people are not allowed to put bigger panels - generation on their roof. We have a long way to go in Darwin. I agree with you. I have a lot of roof and can generate power for my own needs and sell it, but Power and Water says, 'No, you can't do that, only 4½ kW'.

Mr WOOD: One of the issues with solar - I might refer it back to your power generation - is people put stuff on their roof but no one is doing the mathematics on how many carbon emissions has been required to get it onto the roof; however, that is another issue. They use power lines provided by the government - they do not pay a rent on putting my electricity back down the line - and in your case would Power and Water require you to pay a rent to use their power lines to transmit your electricity?

Mr MAJOR: In my submission I mentioned Vector Energy in Auckland, New Zealand, which is not a retailer, not a generator, but they have responsibilities for the poles and wires - the distribution. From their perspective it made sense to offer their customers a hybrid solar and battery system. It is not leased, it is not sold, it is on a service agreement which means Vector Energy at any time during the day or night can tap into that battery and use that energy supply to reinforce their grid if there are fluctuations or issues.

When I say Power and Water needs to innovate, these are the areas where any utility company on the globe has to innovate. America is innovating, Australia is trying not to innovate by coming up with proposals to penalise solar households for having solar. Queensland and New South Wales are two of the jurisdictions at the forefront of doing that. We are not working in Queensland or New South Wales so I feel comfortable saying this, but they own the utilities, they own the generators, they own the retailers and it is in their best interests to make solar the reason for attacking their business model ...

Mr WOOD: That is the Cloncurry site is it not?

Mr MAJOR: The business model has to change.

Mr WOOD: The Cloncurry project they scrapped.

Mr MAJOR: The business model has to change. The utility business model in Australia is we have a massive generation project next to a coal mine with massive transmission line into the population centres, another distribution company then a retailer. That is missing the point. That business model is under threat and has to innovate. Governments supporting the status quo and propping up a failing business model is not in the best interests of government or the customer.

Mr McCARTHY: Alan, is anybody building nuclear in the global context?

Mr MAJOR: Yes, China. China is coming up with new fast breeder reactors and the like, but I come back to there has not been a nuclear facility built and commissioned in the United States since 1975.

Mr CHAIR: Are they building one now in the States?

Mr MAJOR: They are building two at the moment.

Mr VATSKALIS: So is Britain.

Mr CHAIR: We have run out of time Alan. One thing in your report I need a bit of explanation on is smart infrastructure. Can you clarify that for me?

Mr MAJOR: Certainly, I alluded to it in response to Mr Wood's question. The way the grid infrastructure is being developed at the moment is an integrated system which brings in the distributed generation of households and potential for electric vehicles or domestic solar storage and any number of opportunities in the future.

If one thing that Hurricane Sandy in New York proved, it is the value of a micro-grid. If you can supplant that legacy infrastructure, where you have a major plant that goes through to transmission lines and distribution feeders into a community, and supplement that with a micro-grid using solar and storage and more distributed generation, and use the backup of the baseload to underpin it, then you come up with a sensible business model.

With ABB and Siemens and all the smart people in Japan and Europe coming up with software and hardware to supplement a smart grid methodology, it just makes perfect sense. From our perspective it means that tidal energy continues to provide a low carbon electricity supply into the grid. If you were to now look at the perfect model, we would be topping up the household batteries overnight or when required while the solar panels are doing their job to feed industry down here in Darwin.

Mr CHAIR: I do not want to add to a political question yesterday, but would the policy of splitting Power and Water up facilitate any of your innovations? Do you see that as a plus or a minus? Just a simple answer on that one.

Mr MAJOR: The simple answer is we did not contribute to the Utility Commission's review of the wholesale electricity market. It is a waste of time for us to expend the energy and the expense on doing that. The only way we could get a project across the line in the Northern Territory would be to have a power purchase agreement with Power and Water.

There are no projects in Australia I know of that are relying – sorry, there are two projects I know of in Australia that rely on a merchant agreement on a wholesale market, and we are not one of them.

Mr CHAIR: Thank you very much for that, Alan.