ENVIRONMENT AND RESOURCES COMMITTEE

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INQUIRY INTO GROWING QUEENSLAND'S RENEWABLE ENERGY ELECTRICITY SECTOR

TRANSCRIPT OF PROCEEDINGS

MONDAY, 26 JULY 2010

Brisbane

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Committee met at 9 am

DENNY, Mrs Sharon Leanne, Manager, Industry Development and Government Relations, Australian Sugar Milling Council

HODGSON, Mr John Joseph, Business Development Manager, Mackay Sugar Ltd

LONGDEN, Mr Gary Frederick, Board Director, Australian Sugar Milling Council

MORIARTY, Mr Mark Robert, Manager, Business Development, Sucrogen

MORTON, Mr Euan Pye, Principal, Synergies Economic Consulting

NOLAN, Mr Dominic Victor, Chief Executive Officer, Australian Sugar Milling Council

RIESZ, Dr Jenny, Energy Analyst, ROAM Consulting Pty Ltd

RUTHERFORD, Mr Shayne, Executive General Manager, Strategy and Business Development, Sucrogen

CHAIR: Good morning, ladies and gentlemen. Thank you so much for your attendance here this morning. I call this public meeting of the Environment and Resources Committee to order. The committee conducts this hearing pursuant to the resolution of the Legislative Assembly of 23 April 2009 that appointed it. The committee has resolved to examine and report on the opportunities and challenges for the Queensland government associated with increasing the proportion of electricity generated from renewable energy sources in Queensland. For this inquiry, the committee will consider and make recommendations on (1) the value for money from the Queensland government's investments in renewable energy projects for electricity generation; (2) whether the Queensland government should adopt a target for increasing the proportion of the state's electricity generated from renewable energy sources and, if so, what form the target should take; and (3) actions the Queensland government should take to encourage investment by government owned energy companies and the private sector in producing more electricity from renewable energy sources.

This is the second inquiry by the committee focused on energy policy and reflects the importance of reducing the state's energy consumption and overall dependence on fossil fuels to environmental and economic outcomes. Energy use in Queensland has trebled over the past 30 years and Queensland's per capita energy demand is the nation's highest. This is not a good record. Moving to a more sustainable energy base also holds the key for the government to meet its commitment to reduce greenhouse gas emissions levels by 60 per cent from 2000 levels by 2050. This target is in line with international moves to mitigate global emissions and climate change risks needed to avoid the most damaging effects of climate change.

Ladies and gentlemen, my name is Carryn Sullivan. I am the chair of the Environment and Resources Committee. I would like to introduce my committee and secretary to you. On my right is Julie Attwood, the member for Mount Ommaney; on my left is Peter Dowling, the member for Redlands; Simon Finn, the member for Yeerongpilly, gives his apologies although he will be here later; Chris Foley, the member for Maryborough; Mark Ryan, the member for Morayfield; and Jeff Seeney, the member for Callide and our deputy chair, is unable to be with us today. He apologises for that. I also introduce my hardworking research director Rob Hansen and assistant research director Rachelle Stacey.

Today's proceedings are lawful proceedings of the parliament and are subject to the Legislative Assembly's standing rules and orders. Witnesses should have been provided with the instructions to committees regarding witnesses adopted by the Legislative Assembly, which the committee is bound to follow. Have any of the witnesses not read these guidelines? Hansard, please note all witnesses answered in the negative.

Under the guidelines, you may object to answering any question put to you on the grounds that the question is personal or not relevant, or that the answer may incriminate you. The committee will not require you to take an oath or affirmation. However, we expect our witnesses will respect the proceedings. The recording of today's proceedings, except by Hansard, is not permitted. It is our intention to keep to the times on the hearing program. We will finish at 3 pm, if not before. We have a lot to get through today so to avoid the need for a further hearing please keep your answers succinct. If you take questions on notice we

ask that you provide your answers to us by next Monday, which is 2 August. Ladies and gentlemen, would you please state your names, positions and organisations for the record and, to assist the Hansard staff, we ask that you state your name before you speak this morning. Would any of you like to make a brief opening statement to the committee?

Mr Nolan: I might lead off, if that is okay. My name is Dominic Nolan, Chief Executive Officer of the Australian Sugar Milling Council. The Sugar Milling Council is the peak body representing raw sugar mill owners in Australia. With us today is Sharon Denny, who works with me at the Australian Sugar Milling Council; on my left is Mr Gary Longden, a director of the Australian Sugar Milling Council and also representative of Bundaberg Sugar, with mills in the far north of Queensland as well as in the southern region; Mr Shayne Rutherford and Mr Mark Moriarty are both from Sucrogen, with mills in the central, Burdekin and Herbert regions; Mr John Hodgson is from Mackay Sugar, with mills in the central region; and we also have Dr Jenny Riesz from ROAM Consulting and Mr Euan Morton from Synergies Economic Consulting who are both, obviously, heavily involved in the area of renewable energy and have contributed to the Sucrogen submission to this inquiry. We are conscious of time. I would like to provide a couple of very brief opening comments and a few of the others will also take that opportunity. For the most part, we would like to get into the question-and-answer type session.

A very brief overview of the Australian sugar industry: we have around $2 billion in raw sugar revenue and around $1.6 billion plus in raw sugar exports. Employment is in excess of 15,000 people across cane farms, mills, harvesting and direct support services. There are 4,000 canefarming entities across 400,000 hectares. There are 25 mills owned by 10 companies in Australia and all but one of those companies are in Queensland, operating 22 of the 25 sugar mills.

There is no doubt that sugar cane is an iconic Australian agricultural industry. Queensland has a proud history of growing sugar cane for over 145 years. It is important, in the context of this inquiry, to look at where the industry is centred and what it contributes. It is certainly not just about revenue and export dollars, important though they may be. Co-generation is not just good for sugar; it is good across regional energy and security and supply. It provides the generation of electricity in regional hubs that suffer most from the vast transmission requirements of taking energy from southern Queensland to northern Queensland. It is good in terms of securing existing jobs. It is good in terms of providing additional regional employment and diversification of the Queensland electricity generation portfolio.

The sugar cane industry is based in regional communities and, indeed, in many instances is the economic hub of regional communities right along the coastal strip of Queensland and extending down to northern New South Wales. The outlook for Australian sugar and sugar cane derived products is better now than it has been for many years. There is no doubt about that. It is due to the stabilisation of global sugar prices, access to price risk management opportunities in a deregulated industry, the rationalisation and consolidation that has occurred over the past decade and some of the other global sugar market implications. I have to say that there is a sense of quiet optimism in our industry. There is capital investment in sugar mills and industry infrastructure on a scale that has not occurred in years and, while crystal sugar will remain the backbone product for the sugar industry, there is no doubt that investment in diversified business opportunities such as co-generation of electricity will contribute to the stability and the sustainable growth of this great industry. Investment in renewable electricity is just one of the opportunities that is available, but it will not happen on a large scale without government and industry partnership, and a solid policy platform and a commitment to renewable energy by the Queensland government that leads to tangible investment.

Sharon Denny is the Manager of Industry Development and Government Affairs with ASMC. She is going to run through the electricity story for Australian sugar and some of the key factors that impact on those investment opportunities. John Hodgson, from Mackay Sugar, has been front and centre of the most significant recent announcement of a co-generation project in the industry. He will provide some direct comments on the Mackay experience. Shayne Rutherford and Mark Moriarty will provide some comments from Australia's largest sugar company, having built and managed significant co-generation facilities in Queensland. Our two colleagues from ROAM Consulting and Synergies Economic Consulting will contribute their broad experience around their expertise in this sector. Finally, Gary Longden, who is from Bundaberg Sugar and is a director of the ASMC, has not only an understanding of the Bundaberg Sugar operations but also an intimate knowledge of the broader industry. He can speak and is here on behalf of the other members of the Australian Sugar Milling Council and can provide information and a perspective on their behalf, given his level of experience and knowledge across the breadth of the industry. With those few brief comments, I might hand over to Sharon Denny, to run through the electricity story for co-generation for the Australian sugar industry.

Mrs Denny: Good morning. I am not going to tell you anything that you perhaps are unaware of here, but I would like to highlight the structure of the Queensland electricity network. It is a 1,700 kilometre ribbon network, principally fed by generation created in South West Queensland, which feeds into Brisbane and then flows up to North Queensland. That is actually quite significant and important to the renewable story, because it creates a high range of transmission losses. We have the highest transmission losses of anywhere in Australia.

The result, of course, is that we have a high cost of investment in transmission to meet peak demand, and that constrains regional development. We have seen some of the real impacts of this in the development of our key townships in North Queensland to the extent that several regional development corporations have grouped together and undertaken a modelling exercise that confirms that, and we are happy to provide that to you at some point if you would like.

The sugar industry is located in critical growth centres for the population and industry. Here we are talking about Cairns, Townsville, Mackay, Bundaberg and Maryborough. In that context, I would like to give you an idea of where we sit as an industry. We currently have 355 megawatts of installed generation capacity through our mills. That is located through those key centres leading up the North Queensland coast. Right now 185 megawatts of that is export potential.

Unlike other generators, we have the capacity to control when we generate. Having said that, we have a six-month generation season right now, but some of our mills generate beyond six months of the year. Some generate up to 40 weeks and for the current projects coming through will potentially generate 50 weeks a year. We have the potential to expand the size of our industry, with a total of 700 to 900 megawatts of installed capacity and with an export potential of 480 to 660 megawatts. The larger project potential of some of these projects is that they could operate up to 75 per cent of the year—as I have said, some of them can operate for longer than that—with an 85 per cent to 95 per cent reliability during that time. To give the committee some idea, that compares with a 35 per cent to 42 per cent variability of some of the other renewable energy technologies out there.

This level of renewable energy delivery and reliability is unmatched in the renewable energy sector at this time. However, we cannot begin to recognise the potency of this potential in our current environment, and that is because, quite frankly, renewable energy is cheaper in southern states. We cannot compete with wind farms in southern states, but we can compete with wind farms in Queensland providing there is a transparent market.

That brings us to our next key problem, which is that the vertical integration of major energy companies in Australia has reduced the competitiveness of the electricity market. There was a time when we went through the opening up of the Australian electricity market for full retail contestability but what we have seen emerge from that is this merging of generators and retailers so that a generation company can make an investment in its own generation and be the retailer that buys it as well. It cuts out some of those market exposure costs. It means that the pricing is no longer transparent. This is a real problem for us as we compete in this generation market.

The projects to date in the sugar industry unquestionably have been the lowest hanging fruit. Even the two most recently announced projects, as you heard Dominic mention before—both the Sucrogen project and the Mackay project—are still very much about the lowest hanging fruit. I am sure they will talk to you about those in a moment.

One of two critical factors retarding our future investment is price gap. Queensland needs to find a way to close the gap between Queensland renewables in southern states. That is the fundamental issue at stake here. We need to find a way to make greater transparency between these generator-retailer off-take agreements. As we highlight in our submission, we simply cannot finance projects if we cannot develop a power purchase agreement. But, if we cannot get transparency on that agreement when we are competing with a vertically integrated company, we are going to continue to struggle to get these projects up.

There is also a range of other barriers, and they are not the most critical stallers but they are important to be aware of, too. They are things like capital costs for infrastructure—this is an issue that has gone on across Australia in every industry—transmission and distribution network costs—in particular interconnection, and I am sure there will be some questions and an opportunity to discuss that soon—and regional energy planning, and by that we mean the time it actually takes to get a project up in the Queensland energy sector.

These are challenges. They are not insurmountable and they are not ones that government does have not necessarily have a role in either. Ultimately, our message here is that any policy that the Queensland government might consider to address this gap right now between Queensland renewables and the rest of Australia has to address these two most critical issues of price gap and vertically integrated companies with power purchase agreements.

Mr Hodgson: My comments relate to the most recent project that we are currently constructing in Mackay. It is a $120 million, 36-megawatt renewable electricity plant which will supply about 30 per cent of Mackay's electricity. Approval for that project was given earlier this year and we should be commissioning shortly.

CHAIR: Do you have a completion date?

Mr Hodgson: Sorry, I should not have said 'shortly'; the end of 2012. We still have another two and a bit years to go.

CHAIR: Thank you.

Mr Hodgson: That project will employ about 270 construction people on site. Two vital components contributing to the viability of the project were the 20 per cent RET scheme, which went through the federal Senate last August, and the $9 million grant that we secured through the Office of Clean Energy. That is a Queensland Renewable Energy Fund grant. Both of those were critical factors in our project being approved earlier this year.

I have listed in our submission some of the obstacles that we encountered while we were attempting to get this project approved. Capital cost was probably the major item. When we started work three to four years ago with a reasonably concise specification, the cost was $82 million. Our final sign-off cost was $120 million. We have found that over the last 20 years the real price of these large construction projects has doubled in real terms.

Fortunately for us we had the project approved before 1 July this year. Grid connection costs for our project will be recovered by Ergon Energy—the local network service provider—through annual network charges. There has been a charge in federal regulations, and those charges will have to be borne by the project proponent at the time that you go ahead with the project. If that had been the case prior to 1 July, if these new rules had been in place, our project probably would not have gone ahead.

Another negative for our project is that we had banked on receiving avoided TUOS payments, which are payments made by the local network service provider to Powerlink, the transmission provider. Until recently the energy component of those payments was available to large sugar mill projects, but again there has been a change to the national rules. They are demand only payments now, and our sugar mill co-gen projects will not be eligible for that.

Power purchase agreements have been another long, arduous journey for us. We did secure a six-year contract with Ergon Energy, but with wildly fluctuating markets that was a difficult exercise. Certainly for most sugar mill co-gen projects a power purchase agreement over a significant period is required by financiers in funding these projects.

Fuel availability is always an issue for renewable projects anywhere in Australia. In the sugar industry we have good fuel availability during the crushing season. We have to store some of our fuel to be able to run at least three to four months into the off season, otherwise the projects typically are not viable. Any supplementary fuel, providing it is cost-effective, whether it be coal or gas, would be a major benefit to top up and give us a better capacity factor from our projects.

In terms of the scale of the projects, the larger scale projects should be the most viable—just the size of the project—but you must draw on fuel from surrounding sugar mills. We also found it was a little difficult to find skilled staff to develop and construct these projects. We are competing, particularly in Central Queensland, with the burgeoning coal industry. In the resources industry it is very difficult to source cost-effective labour and materials, and that seems to be getting worse every year.

I have made a note in our submission, and I think it is an interesting point, that the $9 million QREF grant that we secured last year was very important to get our project over the line. The output from our project over its 30-year life will be about 6,000 gigawatt hours of renewable electricity. Dividing the $9 million grant by that quantity gives a price of $1.50 per megawatt hour as an effective subsidy for our project from the government. You can compare that to feed-in tariffs of over $400 a megawatt hour which is ongoing.

We have also done some modelling of co-generation and ethanol projects co-located where true co-generation is happening on a year-round scale. The figures look very interesting. This is the Brazilian model that they are developing over there where they have co-gen and ethanol side by side. I believe that will probably give the best economics, but you are bringing another fuel, or another source of energy, into the equation.

Finally, I turn to Mackay Sugar. We believe we have one of the low-hanging fruits, as Sharon mentioned before, as far as projects go. It is going to be difficult to get more up. We believe the frameworks are there and in place for the 20 per cent RET scheme, but extra incentives are needed, particularly in Queensland, to overcome some of the barriers I mentioned to get our projects up.

Mr Rutherford: I would like to make a few comments on behalf of Sucrogen. Some of you are probably familiar that Sucrogen is formerly CSR Sugar, the sugar division of CSR Ltd. I think many of you are familiar with our operations, but I would like to reiterate that we are Australia's largest biomass generator. We have a strong track record in this area. In fact, since 2005 our company has invested approximately $200 million in renewable energy. We have about 170 megawatts of installed capacity, and we currently export 100 megawatts. We have recently announced a small project in one of our mills in the Ingham region which we will be commissioning in 2011.

I want to make some brief remarks about our approach to this submission. What we have tried to do is take a very pragmatic and commercial approach. Project development, whether it is a coalmine, a sardine factory or whatever, is tough. There are always obstacles and challenges. That is no different from the renewable energy sector, but fundamentally we have tried to approach this perspective to the extent that we want to have a share of renewable energy in Queensland—just a really pragmatic response to: 'Is that going to happen?' Our view is that there are some real challenges. Our submission outlines the reasons for those challenges, but in summary, as my colleagues have said, there is, in effect, a structural economic gap. Sadly, that is a result of our superior coal resources and the fact that we enjoy cheap electricity prices in Queensland. Our wind capacity factors are also lower, but the net effect of that is that there is an economic gap in Queensland compared to southern states. What this essentially means is that the renewable premium that is required for renewable projects in Queensland is almost double that of the premium that is required in southern states, and that is quite significant. There are a number of second-order issues which impact renewables, and they probably impact renewables throughout the country. Some impact wind differently from sugar biomass, but the primary issue is this economic viability gap.

The other major issue that my colleagues have talked about is if you can close the economic gap then there are still some market constraints and issues. We operate in the sugar industry. We do not operate in the electricity industry, and it is challenging to manage the risk on these multimillion dollar projects, so off-take agreements are very important and critical. As my colleagues have said, the presence of vertically integrated generator retailers who are also wind proponents does make it challenging to secure off-take agreements to support projects, which is more or less an issue depending on how you finance these projects. I think it is interesting to note that most of the sugar industry co-generation projects in Queensland have off-take agreements with Ergon. To my knowledge, I believe they are the primary off-taker.

In conclusion, we have tried to put forward some policy options that the government might be able to consider to address these issues. We think they are very real issues, but we also think there are some potential policy options that are open to government. Some of my colleagues this morning have indicated that this is a very complex area and we have to be very careful because there could be unintended consequences.

I think that when we consider policy we should also consider the potential impact of such policy on wind and sugar biomass, because some of the policies will impact on those industries differently. We believe there are some tangible and intangible benefits of sugar industry co-gen. We want to remind the committee that, if those impacts could be considered along the way, that would be in the industry's and Queensland's best interests. That is all I wanted to say. I do not know whether any of my colleagues would like to add anything to that.

CHAIR: Thank you very much. You did have limited time to put in these submissions but on behalf of the committee I wanted to congratulate you on your very detailed submissions. We do have a number of questions.

Mr RYAN: I just want to explore the interconnection costs a little bit more. I wanted to get your view on the recent changes to the regulations from a federal perspective and also your view on whether or not the cost should be borne by the consumer. I think that is where the regulation change came through. Ultimately, if the cost is recovered through the distribution through the retail arm then that is passed onto the consumer. Whereas if it is payable upfront by the generator then that forms part of your business decision as to whether or not you construct the plant. So I just wanted to explore the interconnection costs a little bit more and get you to give us a bit of an idea about how much the interconnection cost could be as a proportion of a generation facility.

Mr Nolan: I might ask Sharon to make some general comments then I think there will be some specifics that some of our company representatives might be able to add to that.

Mrs Denny: In the first instance, I think we should look at those changes. I am not sure whether everyone is aware of how much they have changed. Initially, we were required to make a guarantee. In fact, I think the Mackay project got up just before those changes in the legislation came through in terms of the guarantee.

This guarantee is to ensure that the connection company does not end up with a stranded asset. The reality is, though, that that asset is not built until the end of the project or close to the end of the project. If there was a problem with the project it would have been found long before then and you are not likely to get a stranded asset.

In terms of the cost of these assets I will give you an example. We have a mill in Tully right now that looked at doing an upgrade. It was a project that was probably only going to cost $20 million to $30 million. It was going to be a turbine upgrade. There would have been an extra 10 megawatts exported to the grid. But in order to connect that project to the grid they are looking at $8 million. So, in effect, a project that was around $20 million to $30 million is now up around $40 million and a quarter to a third of that price is actually grid connection.

We would argue that, yes, the consumer is picking up the cost at the end but our job is to actually generate electricity not to fund the network. The other side of this issue is that we are connecting with Ergon or Powerlink. They are both government owned corporations. More critically, when we do connect we are located in areas that already have high transmission losses. So when we connect we are actually helping to cut down those transmission losses. We are increasing energy reliability and security and lowering the cost of the community service obligations for government. It seems, from our end, that it is almost a double dip. We are actually helping government to lower its costs and we are paying for the privilege of supplying electricity into the network to lower the cost.

Mr Moriarty: Whether the costs are paid upfront by the project proponent or paid upfront by the network service provider and then recovered from the project proponent over time probably does not hugely impact the viability of the project. It certainly probably makes it more challenging to fund, especially for the smaller companies. But ultimately the consumer will pay those costs one way or the other. It is not likely to change the viability of a project by very much for larger projects but it certainly could be more of a factor in smaller projects.

Mr Hodgson: The interconnection costs for our project were about eight per cent of the capital. As I said, we did not bear that cost—that is with Ergon. It would vary widely depending on your distance from a transmission grid.

Mr Longden: These interconnection arrangements are almost unique for each site. They are not directly comparable. It does depend on the reticulation network in that region and the capability to supplement what is already in place versus the complete renewal of the reticulation system.

CHAIR: Can I just get some clarification. There are always people who tell us that we should not be using our food production to generate electricity because obviously there is a question of supply. In your industry it is purely only the waste product that is burnt and not the actual product, is that correct?

Mr Longden: That is correct. What we are talking about is the fibrous material in the sugarcane—the bagasse—which, at the moment, is used in the production of sugar or whatever other material is used at that facility. To demonstrate the capability, if we crush 30 million tonnes of cane in Queensland we will produce about 10 million tonnes of bagasse. In fuel energy terms that is about three million tonnes of coal. That is the value that that would have. It is used relatively inefficiently at the moment.

Mr DOWLING: Following on from that, I refer to your capacity to produce power 365 days a year. Are there any opportunities for you to partner with other sectors to pick up that shortfall in having product? During the opening statements someone said that they are able to go beyond the season by a couple of months. I note that Redland City Council and others have a supply of green waste going to Rocky Point to help with power production there. We have something that is not yet finished but has certainly been tabled that poultry litter would be used to produce power. Are there any partner industries in the sugar areas that might be able to pick up that shortfall? Following that on, what impact would that have on your bottom line and your capacity to be viable?

Mr Nolan: The short answer is yes. In the sugar industry I think we also recognise that significant projects going forward would, by and large, be looking at generating beyond the six months of the season and most of them would ultimately be targeting up around 50 weeks if at all possible. That is really where the end game lies. In terms of partner industries, Sharon or Gary did you want to kick off?

Mr Longden: There has been some experience with wood waste from the forestry industry. Certainly in the Bundaberg-Maryborough area there has been experience with that. That is not a substantial component of the co-generation capacity that is available. Supplementary fuels can certainly add to what is already available.

Mrs Denny: I think the other thing to add there is that for new projects you need to decide very early on whether you are going to have a blend of fuels. That fundamentally changes your investment around your boiler technology. While it is certainly something you want to do, there needs to be a whole landscaping, if you like, of what is out there as available biomass. Realistically, that means other agricultural industries or the forestry industry.

The other issue with forestry is that we have to be careful about what timber we take on and use as not all timber is eligible under MRET. There are often issues. I am not so sure we have seen them in Queensland, but certainly our New South Wales counterpart has experienced some real issues where their timber residues were recognised under MRET but not recognised under state legislation. There are those sorts of complexities that sit there as well. It is actually quite complicated to set up a range of supply agreements and relationships to get a project up if you are going to have mixed fuel. That is not to say that you should not do them, but they are not easy.

Mr Rutherford: Could I just add briefly to that comment as well. In the Burdekin we have an enormous fibre resource that is not currently utilised—that is the trash. You are probably aware that we actually burn our sugar cane prior to harvest. That fibre resource could generate, say, another 100 megawatts of electricity. This is additional fuel that is inside the sugar industry. The use of that fuel would actually permit 365 days generation because we would basically be able to store that fuel on farm and then bring it back.

There are two other points that I would like to make quickly. One is that the cost of handling this low-value, low-bulk density fuel is very expensive. It is not like coal—that is, light. It is expensive to store. This is part of the issue with storing and reclaiming fuel. The other point I would make is that we currently operate our Pioneer Sugar Mill for about 75 per cent of the year. We deliberately do not operate it in quarter two because of seasonality in Queensland prices. We have high electricity prices in summer and we have lower electricity prices in quarter two heading into winter. At the end of the day, we try to conserve the fuel to meet the available electricity profile. There is a break even point between handling this low-value, low-weight fuel and the electricity prices. Certainly there are options there in addition to the ones that my colleagues mentioned.

Mr Hodgson: Our project actually runs on coal for two to 2½ months of the year. We made that decision at the start. We have a refinery on our site which has to run all year round. We have to have steam and electricity available for that refinery. Our energy mix is about 82 renewable, bagasse, and about 18 per cent coal. That coal allows us to be on line for 50 weeks of the year. For a power purchase agreement that is quite attractive to a retailer. That is an option.

We are fortunate in Mackay in as much as we are very close to coalmines so we can get cost-effective coal. Having said that, if we did not have the refinery there it is not worth the money for us to bring coal down just to generate electricity. We simply cannot compete with the power stations because of our scale. While we have a colocated industry on our site—that is, the refinery that needs energy—it is worth our while to do that.

Mr FOLEY: We are very fortunate in that we have a timber industry as well as sugar industry so we can combine some of those waste products in terms of co-generation. Is there enough sugar being grown? The discussions I have had with millers is that there could be so much more that is milled but the capacity is an issue. What do you see as the barriers? Can you make some comments on whether you would agree with that or not?

Mr Nolan: Is that in terms of barriers to expanding sugar cane?

Mr FOLEY: Yes.

Mr Nolan: We have seen a decline over the last few years in the sugarcane area. That has largely been arrested in the last 12 months. In the next 12 months we are expecting a slight turnaround in cane production. That largely comes down to the profitability of the enterprise involved. As I mentioned earlier, the outlook for the Australian sugar industry is probably better now than it has been for perhaps 30 years. When it comes down to it, farmers will invest in their properties and millers will invest in their milling facilities if there is an economic incentive to do so and if there is profitability.

What we have seen in the last decade through deregulation, through rationalisation is profitability coming back into the industry. Price risk management tools are allowing both growers and millers to forward manage their price risk and lock in prices far enough in advance that they can have a little bit more confidence in their business operations. We are seeing global prices stabilise at a reasonable level over the last year or so and an expectation that that will continue.

I guess what it comes down to for our industry is the confidence in the business that is available. As I mentioned earlier, we are experiencing quiet optimism, is what I would call it, in the industry. I do not think we are going to double the area of the sugar cane available but I think we are going to continue to see strength in the industry. There might be some other comments.

Mr Rutherford: I would add to Dominic's quite extensive comments. The industry is really about the most economic use of land. Prices have been quite buoyant. We expect the outlook to be positive. The industry has also suffered from MIS forestry schemes. But with the recent demise of those schemes we are seeing further land coming back into cane, although some of those large areas are still tied up with administrators. I think the industry is optimistic. We have seen in the last year, probably across-the-board, up to a five per cent increase in the area under cane.

Mr FOLEY: With the current milling arrangements and the mills that are in place, what percentage uplift could you see the existing mill infrastructures being able to cope with if more sugar was grown?

Mr Rutherford: It is sort of how long is a piece of string. From Sucrogen's point of view, we have, for example, crushed 15 million tonnes of cane in our facilities. In recent times we have crushed high 13 millions and sort of early 14 millions. So just in our enterprise alone, there is potentially another million tonne of cane that could be crushed in our existing assets, and I suspect the trend is probably broadly similar across the industry.

Mr Longden: You would probably need to look at the agricultural base of the industry to form an opinion on that. I think last year we occupied over 430,000 hectares and, as Dominic has indicated, that is somewhat consolidated due to better pricing arrangements, futures trading and stronger returns from the market.

Mrs ATTWOOD: Just generally in relation to Queensland and producing renewable energy sources, can you tell us what you think is the most significant barrier to pushing forward in relation to renewable energy targets in Queensland?

Mr Nolan: In terms of the sugarcane industry, the two points that we mentioned earlier are really around the off-take agreements and the economic gap between renewable energy pricing and fossil fuel pricing—the coal pricing. They are the two most fundamental impacts for our part of the renewable energy network going forward. Shayne Rutherford from Sucrogen went into that in some detail in his opening comments but, Shayne, would you like to comment further?

Mr Rutherford: Please help me if I am running into deep water here, but essentially renewable energy is like any commodity and the price of the renewable premium is set by the lowest or least-cost producer. It is a national market under MRET. The least-cost producer in Australia is Southern Wind in South Australia and Western Australia and renewable generators receive two components of revenue—one from electricity and one from renewable energy certificates. In essence, you are looking at the total of those two revenue streams and the least-cost producer sets the total price, which is established in the literature at probably around $125 to $130 a megawatt hour. In Queensland we are the same, so we have electricity prices in Queensland and also the renewable premium. As we have indicated, Queensland enjoys the lowest electricity prices in the country due to our superior coal resources, so that unfortunately puts us at a disadvantage. I think we quoted some figures where there was something like a $20 a megawatt hour gap in wholesale electricity prices in our example, which is quite significant. Obviously the environmental premiums are the difference that is left.

I think the other issue that we face, as we indicated, is the lower wind in Queensland, which tends to put renewables in the sugar industry interestingly on par in terms of their viability with sugar biomass but at a level which is probably not competitive with the best science in South Australia and Western Australia. Because this is a continuum, it is very hard to identify the actual least-cost producer. I think the other

interesting thing to contemplate is the impact of carbon. Not only do we have really cheap coal; we have very clean coal. So to the extent that we see a carbon price, which impacts electricity price directly, it is likely to also differentially increase the electricity price in southern states because the coal resource is more carbon intense. So that is the primary issue. It is fundamentally about economics and there are a number of secondary issues, but that is a very challenging issue.

Mrs ATTWOOD: That is a significant one. Thank you.

Mr Morton: If I could just add to Shayne's comment, what it means is that if a 20 per cent renewals target is to be established it will require intervention, and in practice quite significant intervention through some mechanism to close that gap, as Shayne and Dominic have described it. I would endorse—strongly endorse—Shayne's opening comments that that intervention into the market is a very complex process and there is a great deal of scope for unintended consequences to occur. The important thing that one needs to focus on in that intervention is minimising the impact on consumers in higher electricity charges arising from achieving any target that you set, and that imposes some considerable discipline to the process around how you might go about increasing the component of renewals in our energy portfolio.

Mrs ATTWOOD: Thank you for that very comprehensive answer.

CHAIR: Mr Rutherford, I am actually pleased that you have reinforced the fact that Queenslanders are still being afforded the cheapest electricity prices in Australia. We have not convinced the public of that yet. Governments have subsidised electricity for many years and no-one has ever paid for the true cost of electricity—and of course that is not helped by the extent to which people are now using electricity—and governments are now grappling with that. We obviously need partnerships. Governments cannot do everything. We have received 61 submissions to this inquiry. That is considerable. All of the submissions have a couple of themes that are obviously the same, and that is for governments to help subsidise with any of these projects, and that is why partnerships are so very important. Mackay Sugar has formed that partnership which hopefully will be up and running in 2012 and will prove of good benefit to both industry and government. What I am grappling with is whether the government should put money into research and development and new technologies or whether we should concentrate on the established industries—and you referred, Mr Nolan, to the sugar industry as being an iconic industry in Queensland—and put our money into those well-established industries. Can I have a comment please?

Mrs Denny: R&D is an important part of the renewable energy sector, but the real risk here is that we have a 20-year window that the renewable energy target is operating for. If Queensland does not actively try to take its share of that window, then at the end of the 20 years it will end up having a higher carbon intensity on its electricity than perhaps other southern states because the greater investment in renewable energy will occur down there. Right now Queensland has a lower carbon intensity not only due to the cleaner black coal as opposed to brown coal in Victoria but also because of the high investment in the 13% Gas Scheme and the major rollout of gas in the last 10 years. So the risk I think for us is to actually end up focusing on what we might have in 20 years time and lose the opportunity that sits here today, because realistically the window for renewable energy in the sugar industry is not always going to be there. It comes down to what is the best value for our bagasse. In the carbon economy, the price signals that come through from that carbon economy are going to change what we want to do with that bagasse as well.

Mr Rutherford: I think Sharon has made some excellent comments there. In terms of sugar co-gen projects, John's project is about two years in construction and probably about two years in planning. So even for a technology that exists, is mature and everyone is comfortable with today, if we started from scratch today you are looking at four to five years before you are making electricity, and obviously you have to build the substantial network infrastructure as well during that time. So in the context of a 20- to 30-year scheme, mature technology off the shelf takes five years to implement. I think that a balanced approach is obviously prudent, because a large component of this is probably industry development. When you are looking at mature technology for four or five years to be investing in R&D and then you have to go through a commercialisation phase and then an adoption phase and an implementation phase, I think the lion's share of our renewable target could be met by existing technologies. As we have indicated, there are plenty of opportunities—something like an additional 700 to 1,000 megawatts. Sucrogen alone has probably 200 megawatts of projects investment somewhere between $800 million to $1 billion which we would be prepared to make under the right economic circumstances which would go a long way to underpinning the security of our industries and our local communities as well.

Mr Moriarty: I might just add that the Clean Energy Council has done some research that indicates that projects currently on companies' books with project names and proposals are enough to meet the 2020 target. So within the current target there probably is not room for projects for which the technology does not yet exist.

Dr Riesz: I think a very important point is that Queensland consumers will be paying for the renewable energy that comes under the 2020 RET, but that renewable energy is very likely to have only a small proportion built in Queensland. So for Queensland to see the benefits that come from that investment, there will need to be extra incentives to close that gap for those Queensland projects.

CHAIR: Thank you.

Mr RYAN: Mr Rutherford, I have two quick questions about your submission. Firstly, I just wanted to explore the decision making behind the additional investment at the Ingham sugar mill worth $24 million. That is a big investment, so I just want to understand, I guess, a bit of the commercial thinking that went behind that. Secondly, under some of the potential policy options you talk about feed-in tariffs. I just want to get some of your thinking about whether or not from a generator's point of view there is a preference for net or gross and whether or not you have had a think about, from the sugar industry generation point of view, how much you would need to cover that price differential.

Mr Rutherford: Okay. I think your first question is an excellent one in terms of the Victoria co-gen project, because it can be quite confusing when you see projects being announced and being delivered. There was a comment made earlier about the low-hanging fruit, and what you are seeing and what you will continue to see is opportunistic co-gen projects being announced and delivered in the sugar industry. In the case of our Victoria co-gen project, we had two ageing generators that needed to be replaced. We also had existing steam capacity. So this, if you like, was a very low-cost opportunity. Just to put that in perspective, capital cost is only one side of the equation. In terms of the Pioneer project that we implemented in 2005, the metrics are something like $3½ million per export megawatt. The Victoria project has something like $2 million to $2½ million. So five years later, it is a considerably cheaper project. Today I think some of the numbers floating around are more like $3½ million to $4 million a megawatt. So in terms of the economic gap, we are talking about generic projects of that capital cost. So our Victoria co-gen project was a very low capital cost. That was a great opportunity.

We also took the opportunity to replace our turbines and put in a bigger turbine generator than we would have otherwise, taking advantage of the additional revenue. So it had a strong staying business capital component in addition to a development capital component. In terms of policy options, our submission made mention of feed-in tariffs and government purchasing policy. I guess that we see those being attractive because they overtly address the two main issues that we see: one is the economic viability gap and the other one is the market commercial structure. So, if you like, they kill two birds with one stone and that is the attraction of feed-in tariffs, and you could potentially do that under an auction system as well.

CHAIR: I might have to interrupt there. Unfortunately, it is five to 10. I know that I had at least a couple more questions and the time has gone so terribly fast. We do very much appreciate the fact that you have come in this morning. Do any of you have any closing remarks before I call our next witness?

Mr Rutherford: My colleagues are just suggesting that, to the extent that the committee is interested, we would be happy to provide further comments on the feed-in tariff or anything else in writing at a later date.

CHAIR: Thank you very much.

Mr Nolan: The only thing I would say is that we appreciate the opportunity to be here today. Obviously our industry is vitally interested in this topic and we are looking forward to further work with you on it.

CHAIR: Thank you very much. As I said, we very much appreciate the time that you have taken this morning. Thank you for your most detailed submissions and your openness to answer our questions. Obviously there are not too many farmers amongst us!

BURGESS, Mr James Stanton, Resource and Environment Manager, Timber Queensland

CHAIR: Sir, would you please state your name, position and organisation for the record to assist Hansard, please? Would you like to make an opening statement for the committee?

Mr Burgess: I might say a few words but nothing extensive. Jim Burgess from Timber Queensland. I am the Resource and Environment Manager. In opening, I would like to thank you for the opportunity to come and talk to you and for taking an interest in our submission. The timber industry, as you can tell, is probably not quite as advanced as the sugar industry in terms of bioenergy and making the most of opportunities. However, we have identified bioenergy as a serious opportunity for the industry and we are keen to look at how we can take that forward. If we look at examples from Europe, then we can see that there are well-established bioenergy facilities in association with the timber processing sector. That is an opportunity that we would like to replicate here in Queensland. We are looking at what opportunities there might be to do that. That is all I would like to say.

CHAIR: Thank you very and welcome to our hearing this morning. Obviously, we would like to ask you a few questions. Who would like to start?

Mrs ATTWOOD: I would like Mr Burgess to give us some briefing about how the bioenergy industry would work and just give us a background about that.

Mr Burgess: I guess there are a few opportunities for the industry. The most obvious one and readily available is the use of sawmill residue for power generation. The industry processes about 2½ million cubic metres of timber a year. You can convert that to about one to one in tonnes. In terms of sawn product, the recovery is something less than 50 per cent. The residue from that process is then used for a range of different products—board products, chip products, paper and the like—but there is also a significant volume that is not used. A bit of that is already used in boilers for kiln-drying timber and, depending on where you are—particularly in some of the isolated sites west—some of that residue has no real market. Some of it is burnt just purely for disposal. So I guess we see that there needs to be some change to make sure that that is used beneficially.

Mrs ATTWOOD: Is that a large quantity?

Mr Burgess: It is not a particularly large quantity. Most of the larger processors have markets for their lower-value product. It tends to be the smaller processors that are more isolated that do not have a ready domestic type of market for mulch and those sorts things. So I guess that is one of the first and obvious opportunities.

One of the others is plantations and plantation residue. At the moment, of that 2.5 million cubic metres of sawlog that is processed a proportion is left in the field, particularly in the plantations. We would be seeing opportunities for plantation residue. I do not have a particularly good handle on what sort of volumes are left there on the forest floor but, again, the European examples are that those sorts of residues are collected and processed and used for power generation.

On the plantation side of things, we see that there are opportunities to grow plantations specifically for bioenergy purposes. There is already a small plantation hear Tiaro that is about 250 hectares of she-oak that has been grown specifically for bioenergy purposes. So there is an opportunity to expand that sort of activity in the right location.

One of the other interesting products that is around at the moment or is emerging is wood pellets. Wood pellets are a major product used in Europe for domestic heating and a range of other processes. They are basically dried and compressed sawdust and the like. There is a fairly high energy content and there is a fairly significant export market to Europe for these pellets. I think if we in Australia compress our residues into pellets and then export them to Europe for bioenergy we add a whole lot of energy into the process in terms of transporting them to Europe and marketing them to Europe when we do not actually have that market here in Australia. So I guess there are some real issues and we really need to be developing the market here for those sorts of products and making them work.

CHAIR: Could I just come back to your reference to this Tiaro plantation where you said that there were 250 hectares of timber being grown purely for the electricity market.

Mr Burgess: That is correct—for biomass.

CHAIR: You were here this morning when the sugar industry was here and I note that you were listening with great interest. I would like to ask you a similar question that I asked them. My concern would be that, if there were major competition between whether you grew timber for the industry that you are growing for now or whether you grew the timber for electricity purposes, would this create a shortage of timber in the long term if it were that the price for timber for electricity were higher?

Mr Burgess: Yes, fair point. Right at the moment the value of residue even for energy purposes is significantly less than the value for sawn timber. That is also the case in Europe. So I do not think there is a huge issue in terms of competing with the sawn timber sector. That said, there is significant competition for those processors that currently use sawmill residue. So for the board manufacturers—MDF and chipboard manufacturers—there is a fair bit of competition for a resource there. I guess that is correct. There would be increased prices. I do not see it meaning that we would run out of timber, because we would end up burning it all.

CHAIR: Would your industry not sell to the highest bidder?

Mr Burgess: The growers would but the relativities—there is an order of magnitude, a difference between the value of the resource for timber and for energy.

Mr FOLEY: Just help me understand the sawmill waste. That is cut from green timber. What are the issues of drying that before it can be used for co-generation?

Mr Burgess: As far as I am aware, there are not that many issues in terms of drying it for co-generation. It can be used green. It does lower the calorific value somewhat—not dramatically—but, in terms of producing something like pellets, they need to be dried and they tend to use residue from the dry mill rather than residue from the green mill. But as far as I am aware, it is not a big issue.

Mr DOWLING: Just on the issue of that sawmill residue, what are the reasons given by the government as to why you cannot use the waste for power? Maybe I am asking the wrong side of the table this question but, being in the industry, I am hoping—

CHAIR: We are a bipartisan committee.

Mr DOWLING: Your knowledge of the background.

Mr Burgess: As far as I am aware, the government has no issues with using plantation based residue for power generation. There has been a policy position in relation to the South East Queensland Forests Agreement. In that agreement—I will just read you the clause—'There will be no harvesting of non-sawlog material and residues other than for products currently produced.' I think there was a higher level policy decision that they did not want to see residues, even sawmill residues, from native forests used for power generation and that clause has been interpreted—we believe misinterpreted—to imply that there is some higher level reason that sawmill residue could not be used for power generation.

We would very much like to see that interpretation changed. The issue probably in itself is not constraining all that many activities, although it does constrain a few, but it certainly puts a degree of uncertainty to anyone who is interested in investing in power-generation capacity that is associated with native forests. So there is always that concern—'What if we get this up? Are there going to be issues in terms of government regulation, or whatever, that are going to stop us?'

Mr DOWLING: I got the impression that there is a list of acceptable uses of that waste material from the native species. Is there an opportunity, do you think, for a government to change its position and add co-generation, add power production into that list?

Mr Burgess: There is no list.

Mr DOWLING: There is no list?

Mr Burgess: No. There is an interpretation of that clause and it has come down to—I guess the issues have been felt when a number of mills have previously tried to shift sawmill residue into some of the existing coal fired power stations and, despite moving down the technical path, suddenly find that there is a policy blockage that says, 'No, we are no longer interested in using your residue.' So I guess that is where the influence is felt. It is not necessarily overt but, at the end of the day, it means that some of the mills are not getting their residue.

Interestingly, some mills that have been processing resources in South-East Queensland have historically supplied their residue into power generation—some of the co-generation plants that are used by the sugar industry. So it is an issue that we would like to see cleaned up.

Mr DOWLING: Thank you.

Mrs ATTWOOD: I have a question about the economic viability of using waste for power generation—the labour intensiveness of it all—compared to what we get out of it.

Mr Burgess: Most of the mills are fairly mechanised. I would not have said that there is huge labour intensiveness but, in terms of financial viability, it is definitely an issue. The big issue is transport to facilities. With the sort of money that you get for residue at a facility at around—I do not know, 25, 30 bucks a tonne—if your mill is distant from that facility then your transport costs, even small handling costs, mean that it becomes non-viable. I guess the fact is that there are not that many facilities in the sawmilling region that are looking for a resource. Hence there are not that many opportunities to send the resource to processors.

Mrs ATTWOOD: Thank you.

Mr RYAN: You mention in your submission that you are holding a seminar on 1 July to discuss feasibilities and the industry generally. Was there any discussion at all about feasibilities that flow from the landfill recycling levy that will now be imposed and whether or not that impacts any of the commercial decision making? Because if there is 250,000 tonnes of wood that would normally end up in landfill, then at $60 a tonne that is fair bit of money.

Mr Burgess: Yes. Not very much sawmill residue actually ends up in landfill. The material that ends up in landfill is construction and demolition waste. That issue was not actually discussed at the seminar, but I guess you would have to think that the landfill levy would make a difference to the amount of wood that goes into landfill. I guess the issue is having the facilities and the opportunity to divert it to a new facility. The new environment with a landfill levy will obviously change the economics of a facility. Whether it actually makes a facility financially viable to establish is, I guess, the next step. But that certainly is heading in the right direction in terms of getting some of that wood residue out of landfill.

Mr RYAN: At the seminar what were some of the main discussions about feasibility? What were the key points that were hit by participants?

Mr Burgess: I think there are probably two things. One is the recognition that transport of biomass any long distances really kills the whole viability of a process. I think the other point that came through was the difficulty of making the economics stack up for actually establishing a facility. We had a couple of representatives from Sunshine Energy in northern New South Wales because we were actually keen to look at what opportunities there were to integrate with the sugar industry in terms of using residue. They have just had two of their bioenergy plants on the market because they did not stack up for a range of reasons.

I guess those are probably two of the issues. Given that transport issue and the excess resource tending to be in relatively small volumes, as you bring the scale of your facility down then the cost per megawatt goes up. So you have an increase in inefficiencies as it gets smaller from a financial perspective making it that much more difficult to use that residue. I guess they would have been the two main leanings.

CHAIR: In your submission you said you have made numerous representations to the government about this native forest sawmill residue for power generation. Obviously you have not convinced the government to change its policy. Are you going to make any further representations to government? If so, do you have any new arguments to present for your case?

Mr Burgess: We made some quite direct representations early on when we first became aware that it was going to be interpreted that way. Every inquiry of this nature or any other inquiry that is looking to improve the renewable energy sector we have made similar points in our statements. You guys are the first ones to come and ask us about it so I would be keen to see some action as a result of this committee.

That said, we have to some extent put it a bit on the backburner until we have actually got, I guess, a proposal that is being constrained by it. There is not much point—well, there is a point, but you tend not to get listened to if you go forward and say, 'This is going to happen'. You actually need an example of where this is constraining industry. I am aware that there has been a proposal for a bioenergy mill in Oakey that certainly had some initial concerns about that particular clause. It turned out that none of their resource is actually being drawn from South-East Queensland so in effect they are not affected by it. But it does produce some concerns in terms of security and certainly about whether they are able to proceed with projects like that.

CHAIR: I am mindful of the time, but we did start a little bit late so I would like to ask if you have any closing remarks for the committee before we call our next witness?

Mr Burgess: I guess apart from those financial aspects and support to improve the financial viability of bioenergy, from an industry that is interested in getting involved in bioenergy, the degree of support for an industry to fully understand what the opportunities are for bioenergy, to actually get some technical expertise without spending huge amounts of money on a consultant to just in the first instance understand what the opportunities are. I think that it would be of assistance to the industry to actually have some really serious and sound support from people who understand the sector and understand what is required to actually get involved.

I think that there are certainly a number of our member mills that are keen to get involved, even on a relatively small scale, but they simply do not have the finances to engage a consultant to tell them that it is going to cost them X millions of dollars that they are not going to be able to find. So it is really, I guess, that expertise, particularly in small scale generation, and how small scale generation can then link back into the grid and sell energy into the grid and get into the market. I would see that that would be an area that would be of some assistance to the industry.

CHAIR: Thank you very much for attending this morning. We very much appreciate the time that you have taken and we wish you well in your endeavours.

Mr Burgess: Thank you.

LIVINGSTONE, Mr Alex, Chief Executive Officer, Growcom

PUTLAND, Mr David Alan, Climate Change Officer, Growcom

CHAIR: Gentlemen, you probably know the procedure but I will go through it very quickly for you. If you would please state your name, your position and organisation for the record to assist the Hansard staff and state your name before you speak this morning. Would either of you like to make a brief opening statement for the committee?

Mr Putland: Growcom is the peak industry body for the fruit and vegetable industry, the horticulture industry in Queensland, and we provide agripolitical representation as well as a range of services to the growers. Growcom is strongly supportive of efforts to increase renewable energy and other forms of clean energy in Queensland. As we have shown in our submission though, we do have a couple of concerns. One is that any pursuit of higher renewable energy targets does not compromise other existing industries and also that it is done in the most cost-effective manner in terms of the interests of consumers.

Mr Livingstone: Just to expand a little bit on what David was saying, yes, we do support renewable energies very strongly and we have actually taken some steps in relation to that in terms of generating gas on-farm from waste renewable sources. So we are a little bit down the track on this and we are very supportive that the government is actually taking note of it and actually moving forward.

CHAIR: Thank you very much. Are you happy to answer some questions?

Mr Livingstone: Certainly.

CHAIR: We welcome Mr Simon Finn.

Mr DOWLING: I noticed in comments to question 7 your concern about using good cropping land and turning it into harvest plantation for alternate energy. How do you see, going forward, the use of land? Do you see that we are constrained with what we currently have by way of a footprint for agricultural land and/or harvesting of anything, or do you see that Queensland has a capacity to grow that? Do you see this as a battle line between either power production through a fuel growth strategy or through a food based strategy through providing our needs to the world for our own requirements for consumption?

Mr Livingstone: There are multiple competing factors for good quality arable land. It is not only for food production or the production of things that can be turned into fuel; we also have major competing issues around the periurban area, where residential areas are encroaching on what is traditionally the best quality farmland. So there are multiple factors competing for the land as it exists at the moment. We are a bit concerned that by using up that land we are not replacing it. You cannot replace the best quality agricultural land. And we are not creating more intensive agriculture friendly areas—areas that have irrigation, dams, access to water and security and that sort of thing.

Mr Putland: I might just add that obviously it is related to the protection of strategic cropping land, which is another issue that governments are dealing with at the moment, and I think the two are related. It also comes back to one of the points that was raised with the sugar industry earlier about the use of waste products rather than food production generation. That is also something that we are concerned about: that we do not see food products going into generating electricity forcing up the cost of food as well. That has been the experience overseas. We want to make sure that any increase in biomass in particular is using waste products. An example of that is our existing one, the Banana Waste 2 Energy project. It is using waste or reject material to generate gas on-farm.

CHAIR: I was interested to read about the Banana Waste 2 Energy project. Can you tell me where it is and explain a little bit more about it?

Mr Livingstone: The project actually started a number of years ago. It builds on some very basic research from Queensland University that says if you actually put some biomass into an anaerobic digester it will rot, produce methane and then you can use the methane to go and power engines or generators and produce electricity. We thought we would have a shot at this on-farm—to take the laboratory research out on-farm and see how it works. We wanted to do it from the point of view of sourcing materials from your local supplier so that you did not have chemists and fancy computer-controlled techniques and all that sort of thing. It was going to be fairly rough and ready. We have built a large anaerobic digester. We feed the banana waste—the stuff that feeds straight out of the banana packing plant which used to get chopped up and thrown back on the fields and would rot in the open air—into the digester. It breaks down inside the digester, produces methane, the methane is taken off through a compressor and compressed into bottles for use in whatever you want to do with it. Then the liquid can actually be taken off and put through the irrigation system as a fertiliser back onto the fields.

Our first digester that we have built has a couple of teething problems. We are sorting through those. It was not unexpected that there would be some problems. That is why you build a prototype and have a look at it. It does work, it does produce methane and we can power engines from it.

CHAIR: What is the waste? Is it all those bananas you cannot sell?

Mr Livingstone: There are stalks and bananas. They can be blemished bananas which are perfectly fine but you are not going to sell them in a shop. They go through a series of rotating knives that cut them up into two to four inch chunks and then they go down a chute into the digester.

CHAIR: Someone was trying to start up a banana wine industry with all of those bananas that you could not sell. What happened to that? It did not get off the ground?

Mr Livingstone: I don't know. There are lots of good ideas with bananas, but we only have one.

Mrs ATTWOOD: Was that digester your invention? Is this a new thing?

Mr Livingstone: I suppose the science of it is well known. The actual digester—we thought of a slightly different way to do it, but it has been done overseas that way. We have done it here. It is actually quite suited to North Queensland because it is a big black bladder sitting in the tropical sun. So it gets nice and warm and soaks up the heat.

Mr RYAN: I want to explore some of the thinking of some of your members with an attractiveness to renewable energy generation. Would it be correct to say that generating your own electricity on a large property is better than getting the electricity from the network because of those infrastructure costs which are often borne by the private landholder, I imagine, to run powerlines into a house? Is the appeal from your membership more about generating the electricity on site than having to make the infrastructure investment to get the power from the network? If so, would your members be more likely to invest in battery storage rather than necessarily connection to the network?

Mr Putland: I think the short answer is that it depends on where they are and what they are growing; they may simply not have a food stock available to generate their power on site and, of course, there is the distance from the electricity grid to consider. In terms of a cost-benefit analysis, the short answer is that it depends.

In terms of what is most appealing to certain growers, I do not know that we have the information on that at this point. Some will certainly be interested if they have the waste product available. As we have shown from the banana plant in Tully, it is possible to generate your own methane to run a car or run a generator on site to power their packing shed. I think some of the impediments there though are about removing that initial risk of going into a venture like this; it is the capital cost. A lot of them would be a little bit wary of that. The other is the demonstration of a mature technology, that this will definitely work. I think the banana waste to energy product is not quite there yet. It is rough and ready. It is very low tech. It has had some teething problems. It works but we have some sorting out to do yet before other growers would look at it and say, 'This is something we could do to power our farm.'

Other growers are probably interested not so much in generating their own power on site, but what they can do—those that overlap with the sugar industry, and this is coming back to the earlier one again—looking at integration of waste streams in those areas where horticulture and sugar overlap. That might be a way of getting the sugar co-generation plants to run 365 days a year: to get that waste product from somewhere else. We have had some initial conversations with the Sugar Milling Council about doing that. In other areas they would be looking at other renewable energies that they could employ on farms such as wind and solar and how they can do that cost-effectively as well.

Mr FOLEY: Obviously the breakdown of biomass and all of that is very straightforward. In relation to the production of methane, roughly what is the process of then turning that into power? You talked about the fact that raw methane generated could be used to power a car, for instance. What do you do with the methane then?

Mr Livingstone: The methane is actually taken off the top of the digester and we then put it through a compressor and compress it into gas bottles. It is then compressed natural gas. Once you have that compressed natural gas you can actually run that straight into a generator. So there are generators which are built specifically for that sort of thing. So they are expecting an air mix of about 50 per cent methane, which is roughly what we get out of the digester. One thing we have played around with is actually using that compressed natural gas to substitute diesel in a diesel engine. So you still run maybe 50 per cent or 60 per cent diesel and then you put 40 per cent of compressed natural gas on top of that. But that is a little bit more sophisticated than just running the gas straight into it.

Mr FOLEY: So that becomes a blended volatile fuel sort of thing?

Mr Livingstone: Yes, but it is only blended in the air intake, not before then. So it is two separate fuel supply systems.

Mr FOLEY: Injected simultaneously?

Mr Livingstone: Yes.

CHAIR: I just want to pick up on a point that you made in your submission on page 4. You were talking about a number of different renewable energy sources. You were interested as to why in our issues paper No. 2 we had not included wave/tidal, which you say here is peculiar given our coastline. This is a fairly new committee, but we have managed over a small period of time to have a look at a number of renewable energy sources. We were fortunate to meet up with a company which has actually been given about $4 million from the New Zealand government to try to get a prototype of a wave action model, which we found quite interesting.

I understand where you are coming from in relation to our coastline, although we do not have a huge amount of wave action along a lot of the coastline due to the Great Barrier Reef and other impediments. We had some concerns, though, as a committee about this prototype. I particularly asked them about what type of anti-foulant they were using on the equipment. They said that it was the same as anybody else would use in the marine industry. I did query them on that environmental aspect. They basically said it was not their concern. Obviously, as a committee we need to look at all of those aspects. All renewable energy sources do have environmental concerns, although obviously not as harsh as the fossil fuels. Do you have any comment on that and whether you have actually thought about those environmental concerns on renewable energy sources?

Mr Putland: I guess this was just a little personal note rather than anything to do with Growcom's official position here. I think it is very important—I am sure you realise—to consider all of the options. One thing that struck me when we were looking at the plot in the discussion paper that was sent out is that it did not include wave/tidal. I was just a little curious as to why that might be.

Given that we do have issues with the water supplies as well and it looks like desalination may be something that needs to be employed further in the future, having desalination and a power supply co-located might be something very beneficial, including some of the new technologies where the single plant can do both and you can literally switch between desalination and power delivery as you like. That was more of a personal note.

The other thing we would add there, too, is that in that same point we raised that it is important to consider not just renewable energy but other clean energy options in a transitioning period going to closed cycle gas turbines, for example, and then of course there is always the spectre of nuclear that people do not seem to want to discuss. Again, this is a personal view and is not an official view of Growcom. I think it is something that comes up quite often.

CHAIR: We are happy to clarify that.

Mr Putland: Another point that does come up quite often is a question about whether renewables can, in fact, deliver the energy we need and whether nuclear needs to be on the table as well.

CHAIR: Were you here this morning when the sugar industry people were here?

Mr Putland: Yes.

CHAIR: I basically asked that question that governments do grapple with, whether they should put their money into R&D or whether they should put it with well-established industries. They made the point that it was the timing that was the most important issue here to reach our target for 20 per cent by 2020.

Mrs ATTWOOD: I just want to raise the point about the barriers for Growcom in pursuing renewable energy.

Mr Livingstone: There are a number of barriers. The principal one is just getting the capital together, to take all the lessons we have learnt and go and build a new one from scratch. That is obviously a barrier. There is significant interest from our producers who, contrary to their broadacre friends, are generally much smaller establishments but have a much higher power requirement and the more remote you become, the less reliable that power supply is. To have the ability to kick in and out and source your power from renewables makes a lot of economic sense. But before that can be taken up, we have to go and do at least another one pilot site where we take all the lessons we have learnt and try to work the bugs out of it and make it 365 days a year. That is going to be difficult.

Mrs ATTWOOD: What are the costs of having a digester?

Mr Livingstone: For a reasonable size digester, we could probably get it down to the order of about $150,000, maybe a bit under—maybe $120,000.

Mrs ATTWOOD: I guess you have got some work to do on it, so that is a further cost.

Mr Livingstone: Yes.

CHAIR: Any further questions? Morning tea will be served shortly. We are more than happy to invite everybody to morning tea, but do you have any closing statements that you would like to make?

Mr Putland: I think we have covered all the points we wanted to make. I would just like to thank the committee for showing interest in our submission.

CHAIR: Thanks for coming. Gentlemen, thank you so very much for attending this morning. We do appreciate your time and we are very grateful for your most detailed submission. I am pretty keen to talk to you about your award-winning RE project. I will look forward to doing that over a cup of coffee if you can stay around for a couple of minutes. Thanks very much. We will actually be back here by 11.10 and the next witness is Centre for Appropriate Technology.

Proceedings suspended from 10.40 am to 11.12 am

DONNELLY, Mr David, Bushlight Program Coordinator, Centre for Appropriate Technology

GRANT, Mr Andre, Senior Technology and Project Manager, Centre for Appropriate Technology

PRESTIPINO, Ms Cheryl, Queensland Regional Manager, Centre for Appropriate Technology

CHAIR: The next part of our hearing is unfortunately going to have to be done by teleconferencing. You will have to just bear with us.

Mr Grant: Good morning. This is Andre Grant speaking.

CHAIR: Good morning, Andre. It is Carryn Sullivan here, the chair of the Environment and Resources Committee. How are you?

Mr Grant: I am great. We also have Dave Donnelly here.

CHAIR: Hello, Mr Donnelly.

Mr Donnelly: Good morning, Carryn.

Mr Grant: We also have, just observing, our Regional Manager, Cheryl Prestipino.

CHAIR: Good morning, Cheryl.

Mr Grant: She is actually not sitting here. She has been called off on another phone call at the moment, but she will be back in a minute.

CHAIR: Thanks, Andre. We are just putting a microphone very close to the phone. I would like you to be mindful that we do have Hansard here. If you could speak as loudly as you possibly can, that might help proceedings.

Mr Grant: Certainly. I will try to tame down the Scottish accent as well.

CHAIR: That is much better. Thank you very much. Most of our committee is here except for Mr Jeff Seeney. I do not think we have had the pleasure of meeting you and we will not be able to do that today. We do appreciate the time that you have taken out obviously to answer questions from this committee. Would you like to make an opening statement before we ask you some questions?

Mr Grant: I guess my opening statement would be around the focus and the general themes of the submission that we sent to you. Obviously we are putting a heavy focus on our own personal experience or our own experiences in organisations working with remote Indigenous communities. We have been working briefly with the Torres Strait Regional Authority on a small project, looking at opportunities up there. This is very much an outcome of some of the things we have been looking at in regards to remote communities and renewable energy opportunities. There is very much a focus on that.

CHAIR: Are you ready for questions?

Mr Grant: Yes. Would you be interested in a run-down on our organisation? Would that be of benefit to the committee?

CHAIR: Yes, it would. The only thing we have had from you is the submission, so a bit of history and a breakdown would be great. We are mindful of the time, so if you could make it brief.

Mr Grant: Yes. The Centre for Appropriate Technology is a national Indigenous organisation. We employ about 100 staff across four offices, being Cairns, Derby, Darwin and our head office is in Alice Springs. One of our most relevant programs and where we are drawing our expertise from is our Bushlight Program. That is a renewable energy program that supplies energy services to remote Indigenous homelands and outstations mostly, and does some work around energy efficiency in larger communities at the moment. We have installed around 130 remote area power systems, that is stand-alone units, in homelands around Indigenous Australia. We have quite a bit of capacity in that area to comment on, I guess.

CHAIR: How long have you been operating?

Mr Grant: We have been operating for 30 years. We just celebrated our 30th anniversary.

CHAIR: Congratulations. You must be doing something right.

Mr Grant: Let's hope so, yes.

Mr FOLEY: What forms of renewable energy do you encourage for use in rural settings? In your 30 years experience, have you found that certain forms are more appropriate for communities than others, as in not as accessible to other communities?

Mr Donnelly: We use almost exclusively solar renewable energy. There are several reasons for that. Firstly, there is the maintenance side of it. We find it is very low maintenance. There is no maintenance work to do, apart from cleaning the panels occasionally, which can be done by the local community. The other reason we have not gone into wind turbines so much is that in a lot of the areas that we work in the wind resources are fairly limited and, secondly, there are a lot of issues with occupational health and safety and all the other issues with maintaining wind turbines. It is exclusively solar.

Mr Grant: I think solar is the easiest to predict your outputs, as well.

Mr Donnelly: Correct.

CHAIR: Sorry, what was that last comment?

Mr Grant: It is easier to predict your outputs with solar power, as well. It is easier to predict your power production.

Mr Donnelly: With each of our systems, we look at meteorological data and climate data, and we can actually predict with reasonable accuracy the output of the system and, therefore, match that to the requirements of the customers.

Mr Grant: The centre has done some cost projections, life cycle sort of projections over a number of years into the future of a system, so you can actually project 25 years into the future with solar incidence data that you can get—David is keeping me right there on the terminology—so a cost analysis is more predictable than with your wind data.

CHAIR: Thank you, gentlemen.

Mrs ATTWOOD: What would you define as an ambitious target for the Queensland government on renewable energy, as you stated in your submission, and over what time frame?

Mr Grant: I had not actually thought about what that target would be. I would say that would be something that would be assessed in a realistic fashion to the way the renewable energy industry is now, how quickly the infrastructure can be mobilised or developed. Queensland has a lot of opportunities yet to be capitalised on for renewable energy, especially around wind. There are a lot of projects in the pipeline. I think you would set something that would be achievable and possibly in line with the MRET, though I believe Queensland is slightly behind other states on that.

CHAIR:I have read your submission and you talk about some enormous savings over time when compared to diesel costs. However, you do not state which forms of renewable energy you are referring to. Can you just enlighten the committee on what those are?

Mr Grant: Certainly. That would be what I was talking about before, about life cycle assessments, so looking at a 25-year projection, say, on a 24-hour diesel power solution on a remote outstation specifically, our modelling shows that over that time there are enormous savings over diesel. Obviously, in the first few years the capital costs of putting in a solar power option are way higher than a diesel generator, but after a few years—not a significant number of years, five to eight years—that tipping point comes and then you are into quite significant gains. The cost of the fuel and the cost of maintenance on generators is very high in remote areas, whereas they are significantly less for solar power. That has been our experience with solar power, so it is easier to predict these costs.

CHAIR: Probably the transportation of getting those in there as well would add to the cost.

Mr Grant: Yes.

CHAIR: Can you give the committee some specific examples of the savings that have been achieved by remote communities under your programs?

Mr Donnelly: We can probably send you a report. That is probably the best idea. We have some systems up in the Cape area. We did five of them. We actually have independent data on the fuel usage prior to the solar systems going in and we have data, now, from the resource agency there a year later. It looks extremely good. We can send you that data if you wish.

CHAIR: We would very much appreciate that. What is the time frame for that? How long have you been collecting this data?

Mr Donnelly: The systems have been installed for 18 months now, so we have 18 months worth of data now.

Ms Prestipino: How big are they?

Mr Donnelly: They are only reasonably small systems, most of them. They would be in communities with from three to 12 houses in each. Basically, we have replaced 24-hour diesel systems with what we call a diesel hybrid system, so solar power, in most of those communities, has replaced approximately 80 to 90 per cent of the power usage with renewable resources.

Mr Grant: In addition to that, whereas that may seem like quite a small community, we are talking about three to 12 houses or something like that, when you are looking at some of our remote communities and larger communities on remote grids run by Ergon, obviously you cannot extrapolate fully from a small stand-alone system to a large diesel generated grid. But I think there are certain comparisons you make and it would be interesting. One of our recommendations is to look at an independent study into this on those remote grids, just to look at that and see whether those savings are transferable, as we think they would be to some extent.

CHAIR: With the renewable energy sources that you are referring to, what is the payback period? How long does it take to get money back with renewable energies? How long before they become viable economically?

Mr Grant: I think every community is going to be slightly different, but as I said before it can probably be between five and eight years.

Mr Donnelly: Five to 10 years, typically.

CHAIR: Is that enough incentive for others to take on these schemes? It seems a fairly long period. Industry might say to you that that is a fairly long period to wait for some sort of payback time.

Mr Donnelly: If you look in the short term, the initial capital investment is significant, and that does pose a barrier to putting any systems in. But if you do the life cycle costing, it works out considerably less expensive as opposed to diesel. That is not factoring in the expected increases in fossil fuel prices, as well.

Mr Grant: We are talking about stand-alone systems on remote Aboriginal homelands, so very small communities with a small number of houses. There are large capital costs in terms of battery banks. When we are talking about the focus of this committee, Queensland's renewable energy plan and what you are looking at, we are focusing on the larger communities having a stand-alone Ergon power station where you do not have that battery problem that we are talking about—grid interactive systems. The payback periods for that need to be calculated and they should be less because you do not have a massive battery bank. You are actually grid interactive, so you are offsetting diesel costs directly. As long as the sun is shining, the diesel generator is spinning less and we are using less fuel. You do not have that capital cost of the batteries.

Mrs ATTWOOD: What are some of the major barriers for delivering effective RE programs in remote communities?

Mr Grant: I am just looking at my notes again. We have a few points that we made in our submission. It is hard to find a clear, what they call, penetration limit on these remote grids. So if we take an example of somewhere like Coen on the Cape. It is a community of about 350 people. They have a diesel power plant that supplies power. How much renewable energy can we install in tandem to that diesel generator? In theory, you could go to 100 per cent, but the technology of that is quite expensive. The simplest way to do it is to build a big solar panel array and put it alongside the power station. But there is a limit, there is a certain percentage limit to how much you can put on there before you make things a bit technically complex for the generator. We need some more clarity on exactly what those limits are. That is a technical limitation.

There are opportunities there with the current federal government, the Renewable Energy Certificate Scheme, RECS, that people could be installing household systems in communities. That might be a more cost-effective model for reaching that 20 per cent penetration limit, if that is the limit. But we are not sure how that pans out with government owned housing rather than private, whether there are arrangements that could be made and that is something that we want to look into for the Torres Strait. Obviously the up-front costs are pretty high on installing those grid connect systems on houses. There are ways to get around that.

The feed-in tariff is a point that we really wanted to make here. For these remote grids, it really does make sense to have a gross feed-in tariff, even a special tariff arrangement, for these remote power grids that are not on the main national grid. Because the costs are higher to supply power, significantly higher, it makes sense that if the Queensland government could set up the 60 cent per kilowatt hour gross feed-in tariff on these remote grids to send a clear pricing signal to developers, and even the communities themselves, to be able to set up basically to install solar panels and be able to supply power to that grid at a set price. I think one of the major barriers is really not having clear arrangements for companies to set up the renewable energy supply to these remote grids. They need clear pricing in the form of a feed-in tariff or a clear Power Purchase Agreement to set up for non-Ergon operators to install solar power or other renewable energy power. Does that makes sense?

CHAIR: It did make sense. Do you support the increased development of biofuels? Have you any thoughts at all on biofuels? We had the sugar industry in this morning.

Mr Grant: There are a number of issues with biofuels. It depends where your source comes from, where you are sourcing your biofuels. There is a large amount of debate now around whether it is coming from food stocks, whether it is offsetting food production, which I think is a major issue. The costs of biofuel are probably not that predictable still. You still have the same problems you have with fossil fuels. You cannot predict the cost of it 25 years into the future. We have no idea what the cost of biofuels are, so a long-term pricing strategy is not possible. You can do that with renewable energy. That is the wonderful benefit of it. You can predict 15 to 20 years into the future the price of your fuel, because your fuel stock is essentially free. Sun and wind will always be free, so you can predict that.

I think there is a long way to go for biofuel. Also, it is hard to know exactly what the savings are in terms of carbon emissions from biofuel. It is really down to where you are sourcing it and how it is being done, and the savings are not that significant.

CHAIR: We had representatives from the sugar industry, the timber industry, and the vegetable and fruit growers industry this morning, and there was a slight difference of opinion between a couple of them.

Mr Grant: I am not an expert on that. Definitely, as I said, it is the source.

CHAIR: Because you have been in the industry for 30 years, what lessons have you learnt from implementing these renewable energy solutions in remote Aboriginal communities?

Mr Grant: David, could you comment?

Mr Donnelly: With the approach that the Centre for Appropriate Technology takes, the technology part of it is only part of the solution. A lot of the work we put in is engaging with the community and making sure they understand the limitations of the system, how to support the system and just giving them some ongoing support. We find this works extremely well. The industry has had a history of bringing in a lot of operators who have put technical solutions into places and have then disappeared, and the residents have no idea how to maintain the system afterwards. A lot of the success of CAT and the Bushlight project is based on the ongoing support given to the residents of the community. That is probably the biggest lesson we have learnt, I think.

With respect to the technical side of it, it has not changed too much over the years. As I mentioned, we have used solar technology mainly because the resource is extremely good in Australia. It is one of the best renewable resources in the world for solar power. That is why we use it. The ongoing maintenance, as I mentioned previously, is still very necessary but it is minimal compared with other technologies.

CHAIR: Thank you very much for that, David. There are no more questions from the committee, but is there anything that either of you would like to add before we wind up?

Mr Grant: I would like to reinforce the idea of a special feed-in tariff to encourage renewable energy on those remote grids. It is part of the Queensland Renewable Energy Plan that there is a desire to look at these remote grids and to get renewable energy going in these remote grids.

I would also emphasise that there needs to be an independent body, outside of Ergon, to look at that. I think that with state owned utilities whilst they are great entities they are not in the business of being innovative or looking laterally. It is just not the nature of a state owned enterprise. I think you need to engage an external review to look at what the possibilities are and really quantify those.

CHAIR: You are certainly not alone in those remarks. I think most industries would agree with you on both counts.

Mr Grant: Yes. I think there needs to be continued investment in looking at those technologies and even an opportunity for Queensland to become a bit of a hub for expertise in these remote grid systems. I know there is some work going on which is sort of concentrated in Western Queensland and different places, and I think that is fantastic. That needs to be encouraged more. I think there are some significant savings to be made there.

Another point that has not been emphasised that we made was looking at the community service obligation for the supply of power to remote grids—looking at a review of that legislation to see what can be done and what are the impediments in that legislation to other operators or to communities themselves setting up their own solar power or wind power. If you take an island in the Torres Strait and the community invests into putting a wind turbine in place, do they have access to community service obligation funds?

CHAIR: Thank you very much. On behalf of the committee, let me say that we very much appreciate the time that you have taken this morning and we are very grateful for the information that you have sent us. We wish you every success in perhaps another 30 years and beyond. We look forward to maybe meeting you at some stage in the course of our inquiry.

Mr Grant: Certainly. We would be more than happy to meet with any of the committee members at any time in the future.

GEORGE, Mr Andrew, General Manager, Energy Markets, Infigen Energy Ltd

UPSON, Mr Jonathan, Senior Development Manager, Infigen Energy Ltd

McALPINE, Mr Ken, Director, Policy and Government Relations, Vestas Australian Wind Technology Pty Ltd

CHAIR: On behalf of the committee, I thank you for attending this morning. We welcome your submissions. You may have heard me say earlier that we have received 61 submissions, which is a huge interest. We are very grateful that we have had the opportunity to read through a number of those. We as a committee know a reasonable amount about wind technology. We have had the opportunity to study your industry and to go onto a wind farm in New Zealand which was an incredible experience. We are grateful that we are also able to have this opportunity to ask you some further questions. Who would like to start with an opening statement?

Mr McAlpine: Thank you again for the opportunity to appear before you today and to present to the committee. I am the policy and government relations director at Vestas Wind Systems. I am based in Melbourne and look after policy matters for the Australian business, but I also have a bit to do with our interests in New Zealand. I am familiar with the visit the committee took to New Zealand and the meetings you had, including with the New Zealand Wind Energy Association, of which I am a board member.

I have been working on policy matters for Vestas for about 2½ years and have contributed to debates at both the state and federal levels, all with a view to increasing the amount of wind energy that Australia has. You would all be familiar with the federal government's policy, which is really a bipartisan policy. It is not a Labor or Liberal policy. All parties supported the 20 per cent renewable energy target when it was first legislated last year and also when it was reformed last month in the federal parliament. We think that is an appropriate level of renewable energy and an achievable target, too. It is not without its barriers and hurdles, and there is a lot of work to do to get up to 20 per cent renewables in Australia by 2020. I suppose as part of that each state has a role to play in terms of smoothing the path for renewable energy.

My speciality is wind energy. Vestas Wind Systems, as you can guess from the name, does little else. We are a technology provider headquartered in Denmark but we have interests and employees all around the world in more than 60 countries with 20,000 staff. We provide the design, we manufacture, supply, install, operate and maintain wind farms all around the world. We have worked on that technology for about three decades now. We like to think that we are quite good at it, and we have worked very hard to improve the efficiency of turbines and to get the costs down, because that is the biggest barrier for most, if not all, forms of renewable energy.

Renewable energy has some advantages such as the low or free cost of fuel, but the technology involved is very capital intensive, whether that is for wind, solar or geothermal. Our focus is always on reducing the cost of energy so that wind can compete with conventional fuels and break into markets all around the world. There probably would not be many more markets where the energy is cheaper than Queensland, which is blessed with a lot of gas and a lot of coal, and a strong history of developing those resources. As you will have seen from recent maps released by the federal government, Queensland is also blessed with a lot of wind. The wind is in some areas where there is a natural synergy with other developments of economic resources in Queensland.

Many of the committee members, if not all, would be familiar with the Mount Isa to Townsville economic zone study that was released earlier this year. That has been pretty much welcomed by most people in the renewable energy business, because it shows that there is a future for renewables in Queensland at a large scale. It shows one way—by developing a transmission line—that can help a number of industries across Northern Queensland develop and get up to a scale that is going to make a serious contribution to Queensland's prosperity and its energy security as well. I might leave it there and allow my colleagues from Infigen to make their opening statements. We will then welcome your questions.

Mr George: Thank you for the opportunity to discuss this with you today. The first thing I want to do is give you a potted history of my background. I am somewhat of a wolf in sheep's clothing when it comes to the renewable sector. I have spent most of my career working in the fossil fuel power generation sector.

I started many years ago doing accounts and tax advice for the Portland aluminium smelter which was the most intense carbon-emitting consumer of electricity in Australia. I have worked for Queensland state government power generators and retailers—for example, in the procurement of gas and the bidding of electricity from the Gladstone power station and Oakey power station and the conversion of Townsville to a combined cycle plant in the early 2000s. Then I spent five years working for Alinta Energy in Western Australia with the development of their electricity business in competition with the state run Western Power.

It is only for the last six months that I have been in the renewable space. I think my perspective is a little unusual. I tend to look at these issues from the basis from which we are all working and that is as a fossil fuel dominated base and how renewables are moving into that space as opposed to being somewhat of a specialist.

There are five opening points that I think are worth making from Infigen's point of view. They are more broad based than just Infigen. The first is that Infigen is the largest wind energy generator in Australia. There is 508 megawatts of wind currently established in Australia that we own. There is another 42 megawatts being built near Canberra. So that will be a total of 550 by the second half of next year. Infigen is also short-listed for the photovoltaic, the solar panels, section of the Solar Flagships Program being run by the federal government which is 150 megawatts of solar PV that we believe we have a very good chance of being the winning bidder for.

The third point is the one that Ken just mentioned, that is that Queensland is blessed in some respects with fantastic coal and gas reserves. That also leads to lower wholesale power prices than most regions of Australia. It has some quality wind resources but probably not the uniform quality you would see in the areas hit by the roaring forty winds which are south-west WA, Tasmania, South Australia and the Victorian coast.

The impact that has is that it creates a bigger envelope that you need to bridge in terms of the cost gap between the wholesale power price based on fossil fuels here and the cost of getting renewables into the system. That is without worrying about things like network augmentation. In Australia wind is by and large twice the cost of fossil based fuel delivery at the moment. Solar is about four times the cost. That means that there is a need for REC to bridge that gap in the majority of Australia but probably something other than just the REC value if you are going to get large scale rollouts of renewables into Queensland.

The fifth point I would make is that the last 12 months has seen a range of things happen on the regulatory front, most of which have been away from the federal government taking ownership of this issue in a way which advantages all states and into a period of continuing uncertainty. There is a lot of smoke and probably a little bit of fire to some of those issues that are looming, such as the refinancing of privately owned baseload power stations which is looming in the next three years and an underinvestment in generation in the face of rapidly growing demand and population. Those issues are going to blow up at some point and you will not have 12 months to think about it. It will happen within a matter of one summer and suddenly the urgency will increase.

The fact that that is not being owned by the federal government and that uncertainty is continuing means, as much as I tend to prefer to see things done federally and stop changing my driver's licence every time I move states, that there is a need for the states to pick up that mantle and do what they think is in the best interests of themselves in order to at least provide certainty to the industry as a whole. That applies whether you are a gas generator looking for a carbon signal or whether you are a wind or a solar generator looking for the certainty to invest. I think that applies to all forms and certainly most of all to the coal sector.

With that in mind, I think it is more than timely that the state of Queensland is looking at this issue. Being still Brisbane based and commuting to Sydney four days a week I am the classic example of someone who gets home and reads about this on a state basis three days a week and then goes back to Sydney and tries to bat for it the rest of the week.

CHAIR: Thank you very much for those introductory remarks. I mentioned before that we have been very fortunate as a committee to be able to visit a wind farm. We noticed that they were the three bladed type. Obviously they are very suitable for those high-velocity winds. Because you design them my question is to you, Ken. You said that Queensland has a lot of wind. I have seen a lot of wind maps and I cannot see that in a lot of areas in Queensland we have a lot of wind. Some of it is very low velocity. Have you come up with a design that might better suit the conditions in Queensland as opposed to the ones that we saw?

Mr McAlpine: Yes, we have, and thank you for the question. As you would expect from a company that handles a lot of conditions all around the world, we have had to come up with quite a few solutions to different geographic conditions and wind velocities and other weather factors such as storms and hurricanes. In the case of Queensland, you already have investors such as AGL, Windlab, Infigen looking here. So that gives you some indication that while the wind may not be as strong as in the southern states there is still enough wind for investors to come here because they believe there is a way through. Be encouraged by the fact that there are already companies here looking around to develop sites.

In terms of our own technology, the answer is a very clear yes. Some of the biggest markets for wind energy are in Europe. Europe is not generally a windy place. Parts of Denmark are. Certainly the west of Denmark which faces the North Sea is very windy. As you go further inland it changes. For example, a country like Germany does not have high wind speeds at all and certainly no higher than in Queensland for the majority of the sites that have been developed. We have had to develop wind turbines that will meet those really turbulent, breezy, consistently strong wind conditions and then also design turbines that make the best of the conditions that you have got in a country where the government has decided to go down the path of encouraging wind energy.

I can probably provide you with a bit more information on notice. If you will bear with the acronyms for a moment, the wind regimes around the world tend to be rated in three classes—classes 1, 2 and 3—under the initials IEC. Even on class 3 sites, which are the third best, there is enough wind to make a power station work if you have the right turbine. We have a suite of turbines that range from those for sites that are IEC 1 right through to IEC 3 and everything in between. Most of what we have been doing for the last 30 years is designing our machines to capture as much energy as possible from the wind available as often as possible. The wind turbines cut in at lower wind speeds and can keep working at the absolute highest wind speeds before they have to shut down for safety reasons.

CHAIR: I was absolutely surprised when standing under one of these large turbines that they did not make any noise. I have been told that they are quite noisy things. These were going at full speed—at 220 kilometres an hour.

Mr McAlpine: The key to noise when it comes to wind turbines is really background noise. There is a swishing sound that you will hear, but often that is the wind itself. It makes a noise. There will be people who complain about the wind turbines for all manner of reasons.

CHAIR: I was just going to ask you whether they may have been the opponents of wind turbines as opposed to them genuinely making a large noise which we did not hear at all.

Mr McAlpine: The industry does not make a lot of noise. Noise is actually lost energy. So there is an incentive on companies that make wind turbines to reduce that. So if anyone thinks that we are just ignoring the issue then they are wrong because lost energy means lost revenue for our customers. We have been continually working to get the noise down and make as much money as possible for our customers.

CHAIR: I was actually on your side.

Mr McAlpine: In New Zealand the resources there are fantastic. I remember going to a wind farm and facing the wind. You only had to turn into it for a couple of seconds and your eyeballs would dry out, it was so windy. I have not been to any wind sites in Queensland yet that are being developed. Perhaps Infigen can tell you a bit more about the resource here.

To go back to your original question, we make wind turbines that are suited to all conditions. I am sure we have something that customers of ours would like to use in Queensland. It is just a question of measuring the resources and working out which one would be best suited.

Mr FOLEY: I am very, very interested in the end of wind technology which is the very small scale house end of it. The more I have researched this issue the more I have found that there are a lot of urban myths. We went to New Zealand and had a look at the large scale wind farms. They were up on the top of the hill where it is very windy. In my home city of Maryborough we have averaged 16.1 kilometres an hour wind speed for the last 53 years. It would seem to me if you have smaller capacity turbines that do not need as big a wind speed to start them up that it would work. For instance, the ones that you would see on a yacht.

In my car I have a 600 watt inverter that plugs into the cigarette lighter. Plug it in and you have 600 watts of 240 power. I am working on ideas of maybe coupling a few of those together with some of the smaller scale fans. The technology is there. Now we have the big push on solar PVs we have the capacity to put power back into the grid. Why could a small roof mounted system on local housing not contribute very substantially to that even as a mix with solar?

CHAIR: Do both of you want to answer that question? I am happy to hear from both of you.

Mr Upson: I guess I would have to say it is not our area of expertise because we do focus on the utility scale ones but I am familiar with the technology. There is a guy in my street who, even though there is a powerline going right down the street, is not connected to the grid. He has a wind turbine and PV panels.

There is nothing wrong with residential scale wind turbines. They are available. You can buy them from any of a number of different companies. They are not terribly expensive. What makes it really expensive is all the gear that has to go with it such as the inverters and if you are going to export into the grid then the control system and hardware and software you need for that.

It is a relatively expensive way to produce a lot of renewable energy. I would think the wind speeds you are talking about are not terrific even for the small scale ones. They would be generating some electricity at that speed but not a huge amount. If the idea is to generate as much electricity as possible at the least cost then the larger scale projects will sometimes be five or even 10 times cheaper than the residential scale technologies.

Mr McAlpine: Vestas does not focus on the really small scale end of the market. Our smallest machine these days is 850 kilowatts. We go from there up into the megawatt range. The reason we do that is that we want to compete on cost. We want to get our prices down. We want to make a big contribution to the electricity supply of your state.

For some years now the vision statement for our company has been wind, oil and gas because that is where we want to aim our future development. We want to get to a scale and bring the cost of wind energy down so it can actually compete with the conventional fuels that have powered the economies of the world for the last hundred years.

Mr RYAN: Ken, I wanted to ask a question about your submission. I think correctly you identify transmission as being one of the major barriers for renewable energy generators. I note you came up with an example that is happening in Texas with the competitive renewable energy zone. I wonder whether you could expand a little bit on the experience in Texas and also give a suggestion about how it might work in Queensland?

Mr McAlpine: I would be happy to do that. In the case of Texas, most people around the world would know that Texas is an oil and gas state rather than a wind energy investment destination. That has changed a lot in the last 10 years. Texans are very proud of their energy supply but also very independent people. They do not like importing energy. Their view of wind energy as an attractive investment is based on their goal of energy independence. They do not want to import oil from anywhere and they want to maximise the use of their own resources. If you know Texas, it has some very large cities and a very big electricity demand. Over in the north-west corner—what they call the Panhandle—it has a very low population but incredibly good wind resources.

The only catch, of course, is that you have to get that wind resource, harness it and transport the electricity to the population centres such as San Antonio, Dallas, Houston and the big cities there. The X factor there is the grid. Some time ago the state of Texas government made a decision that they would embark upon a form of almost central planning, if you like—a bit of a rarity in the US, but Texas is big enough to do it. They invented this concept of competitive renewable energy zones. They said that they wanted to harness that wind energy and they identified, after speaking to investors, that grid upgrades and a new grid build out into that remote area of the west Panhandle were the biggest barriers to investment in Texas. So the government on behalf of taxpayers took on that investment risk itself, did a forecast of where wind farms were likely to be and talked to developers the whole way. What they did was reduce the cost for each developer as they built their wind farm and connected in. They paid a connection fee and a significant one when they built their wind farm, but at least they did not have to pay for the entire grid upgrade themselves, and it was not a disadvantage for the first mover. Each subsequent company that has built a wind farm has then paid a fee, but it has only been a segment of the original cost of getting that grid out there.

Texas is bigger than the entire Australian energy market in terms of renewable energy. It is a huge market that adds at least 2,000 megawatts of wind each year—sometimes 3,000—and still has a great growth path. I can send the committee more information on notice which will give you a bit more detail about when this started and how this investment approach worked. But I really do think that while Queensland retains ownership of its transmission companies and distribution companies there is also potential for the government to play a role here. If that is the choice that the government makes—that it wants to go down the path of encouraging large scale renewable energy—Texas did it, they have done it fast and they have been a real success. I think it is a good approach for Queensland to follow, and I can provide that extra information should you want it.

CHAIR: Thank you very much.

Mr Upson: On that same subject, I guess I would like to point out that the current Prime Minister has announced that if they are re-elected they want to spend $1 billion on increased transmission assets throughout the country to connect renewable energy projects. We certainly think this is an opportunity, should that occur, for Queensland to try to get its share of that transmission investment.

Mr McAlpine: Yes. We did notice that over the weekend the Prime Minister did keep mentioning northern Queensland as one of the likely areas to get some of that investment. So that is a billion dollars on the table if the government is re-elected. I do not know what the opposition is likely to come up with, but it is a pretty good policy and it is something that we have been asking for at a federal level for some time now. That investment in the grid will help get Australia up to 20 per cent renewables inside this next decade.

Mr RYAN: From your work and your mapping in the industry, would that investment in transmission get a few projects off the ground? Is that the only thing holding things back—that is, the transmission expansion to some of the more remote places of Queensland—or is there still more need because there are more barriers?

Mr McAlpine: We are a supplier to the industry, so I think the question is better answered by an aspiring investor and developer of renewable energy. So I will pass over to Andrew and Jonathan on that one.

Mr George: Mark, there are two issues really. One is the ability for the network to absorb larger capacity wind investments which is a network upgrade issue. The other one is the wholesale market value of electricity produced in Queensland, and there is a question there at the present time around when that will be sufficiently high to encourage new investment. It is remarkable to me the parallels between where we are today on wind in Queensland and where we were on gas-fired generation about 10 years ago prior to the GEC scheme being introduced. There are probably very similar levels of cost gap involved in bridging from coal to gas as there is from bridging to today limited, if any, wind investment to something that will be far heavier in terms of new investment.

CHAIR: Can I just come back to you, Ken, being the designer of these wind turbines. You have talked about a number of impediments in your industry—obviously the capital cost, the access to the grid, the grid upgrade. You mention in your submission about transport. As these turbines get bigger, some of our roads certainly would not be able to cope with accessing where the wind is. Is bigger better in your industry? In terms of wind turbines, are the bigger ones better? If so, how do you anticipate that we are going to be able to get this infrastructure where it has got to go without that good road network?

Mr McAlpine: That is a question in two parts, so I will answer the first one very quickly. The general trend in the industry is that bigger is better. The trend in the wind industry for the last five to 10 years has been for taller turbines with longer blades on taller towers. The reason for that is to catch as much wind as possible on the same environmental footprint as a lone tower. You are able to get better efficiencies and have wind turbines working at more hours of the day on lower wind speeds with these taller machines. The second part of your question is how do we get these things on to the site. The scale is definitely increasing, but this is not a problem that has not been overcome. I think Queensland would probably be familiar with a lot of large pieces of machinery being transported around some of the highways and back roads of the state.

To give you an indication of the sorts of dimensions we are talking about for wind turbines though, the towers can range as high as 80 to 90 metres tall and they are generally split into three sections. So you can split that into the 30-metre sections at their biggest at present. The blades, however, do not split into sections and we are currently marketing a turbine that has 56-metre-long blades, and that is our biggest. In countries around the world those blades are transported on trains or they are transported on long wheel based trucks. I am trying to think of other pieces of machinery for agriculture or coalmining or other heavy industry in rural Queensland, but I cannot put my finger on any particular one. I know there is a lot of industry out in rural Queensland.

I suppose the answer to this is to talk to the road transport authorities to see what the current limits are and what arrangements are made for other things such as generators or dredges or huge tractors and that kind of thing and then see if the rules can be adapted to allow for transport of wind energy parts over the next decade. It is a nice problem to have, I would say, because we have not had to do it up to this point in Queensland. I thought I would flag it in the submission so that if the government is considering a report from the parliament as to how to develop this industry it is one of the things they factor in so that that barrier does not present itself in a couple of years time and no-one has addressed it.

CHAIR: Just on that, does the higher the unit mean that the blades have to be longer?

Mr McAlpine: They do not have to be. The goal is to get as much energy generated from the wind available, and that depends on a lot of things including turbulence. One of the factors behind turbulence is a concept called surface roughness. It is what wind energy engineers refer to when they are talking about trees, houses or any sort of barrier or thing that stops the wind moving smoothly through and the wind turbine capturing most of it. If the turbine is being buffeted by winds that in turn have been buffeted by rocks or trees or any other shrubs, the further the wind turbines are off the ground the better it is because they are away from any other objects that might divert the wind.

CHAIR: So if you could come up with a blade that was less than 30 metres, it would not pose that same problem? The ones we saw in New Zealand were 40 metres, which was longer than the actual segments of the units.

Mr McAlpine: Yes.

CHAIR: My last question—you did not mention it in your submission—is that obviously with building these turbines you have to have quite a few of them in an area. Is land availability a problem in Queensland?

Mr McAlpine: I do not believe so, but perhaps that is another one for Infigen to address as a developer that is investigating a number of sites. I will say before I leave that issue that, compared to a lot of other forms of electricity generation, wind energy has a very low environmental footprint. We are normally building on cleared farmland for the reasons I mentioned earlier about surface roughness. The farming activities can co-exist in large part with our wind farming activities, so that is a big benefit that we have. We will send maintenance trucks along from time to time to make sure that the machines keep ticking over, but the farming can continue and that is why farmers across Australia love wind energy so much.

Mr Upson: There certainly is not a shortage of land in Queensland to put wind farms. Obviously it is a very large state. We do congratulate the government for making some changes to allow farmers on crown land that is currently being leased to come to an agreement with companies like ourselves, so that was a good step forward, because a lot of the land where we would want to build wind farms is actually crown land. One of the other issues we raised in our submission is that a lot of land in Queensland has native vegetation on it. We only need to clear maybe two per cent or three per cent of the land, but as far as whether that is seen as something that we would be encouraged to do is another question that I think is unresolved at the moment. Obviously if it was high-value vegetation that would be a no-go thing, but there could be just native scrub and things like that that might make it difficult to get approval to do that.

CHAIR: Especially since we have just passed legislation that actually protects it, yes.

Mr Upson: Also before we are done I would like to follow up on Mark's question when he asked if there are any other things that need to be done to facilitate wind energy investment in Queensland. The renewable energy target scheme—the Commonwealth scheme—does actually result in a bit of competition between the states, because companies like ours can invest and build projects in any state that we would like under that scheme. I think it is fair to say that Queensland probably did not get their fair share of investment under the original MRET scheme. For example, South Australia was the winner and they got the most investment.

There have been some developments even recently, and I do not know if you noticed but last week the Victorian government announced a solar feed-in tariff scheme to have five per cent of the electricity in Victoria generated by solar energy large scale projects by 2020, and that creates kind of an interesting situation. Obviously the solar resource in Queensland is superior to Victoria, and I live in Melbourne so you do not have to tell me, but if the economics of that and the feed-in tariff—the details are not known yet—was worked out correctly, it would result in companies like ourselves building solar plants in Victoria because of the feed-in tariff as opposed to Queensland where the solar resource is actually better. You probably did not see this, but I brought along the *Age* for you today because it talks about 'Brumby lays down gauntlet on carbon'.

CHAIR: We try not to read newspapers!

Mr Upson: The Premier of Victoria has announced that he is going to reduce greenhouse emissions by 20 per cent by 2020 from the year 2000 levels. Again the details have not really sorted out how it is going to happen, but these kinds of initiatives at the state government level certainly are noticed by our company and will sway investment decisions.

Mr DOWLING: In terms of the issue with Victoria, the difference between Victoria and Queensland, apart from the sunshine, is the vast distances. Is that part of the reason why Victoria is able to offer a five per cent target as opposed to Queensland not? Do you see that as part of the mix, because Victoria is so small that it is easy enough to feed into the grid for those large scale projects?

Mr Upson: They are proposing the projects up in the north-west corner as the obvious place in Victoria. You would obviously have to ask the government for their exact motivations, but if I were to guess I would not say that they were doing this because of that reason. I think they are doing it because they want to get solar investment in Victoria. They know that, all things being equal, that probably would not happen because Queensland and New South Wales are sunnier. So they need to actually get a leg up and do something to try to get that investment to come to Victoria even though the solar radiation index is not as high as here.

CHAIR: Did you want to make one final comment?

Mr McAlpine: Just before we wind up, it would be remiss of me to not mention the Office of Clean Energy here and its role and also the Office of the Coordinator-General, too. I highlight both of those bodies because I would like to see them play a bigger role than equivalent bodies in other states have played in order to smooth the path for investors in Queensland. In Victoria and in some other states you often get a situation where the government at the top level will set a renewable energy target but lower down there is a lot of confusion between agencies and investors that can be quite hard to get through the maze to get a project off the ground.

Some states are taking steps to improve that coordination. South Australia and New South Wales are good examples in recent times but, in Queensland, you have already set up the Office of Clean Energy and the Office of the Coordinator-General has also been there for some years getting large investments through that process. I would urge the committee to in turn recommend to the government that those two bodies be used very carefully so that they can help investors through the maze and get these things built in the shortest space of time as possible. Otherwise you will end up with the sort of delays that we have seen in states like Victoria, where a lot of projects have been caught up in quite a bit of bureaucracy with investors losing heart and looking interstate.

CHAIR: Are there any final comment before we wrap up? No. We thank you very sincerely for your time here today. We do appreciate it. We have had a rather large interest in this hearing and, as I said, most of us know at least a little bit about your industry and we appreciate you filling in some extra details for us today. We look forward to talking to you again in the near future. Thank you very much.

RYNNE, Mr David, Chief Economist, Queensland Resources Council

CHAIR: Would you like to make an opening statement for the committee and then obviously we would like to ask you some questions?

Mr Rynne: Sure, absolutely. Thanks very much and thanks for the opportunity to speak to our submission, which really concentrated on more of the practical consequences of the impact of greater renewable energy generation, especially as it impacts upon the Queensland resources sector.

Briefly, the QRC is a non-government organisation representing the interests of all companies in resources. So we cover the length and breadth: exploration, mining, minerals processing and energy production in Queensland. The Queensland resources sector is a very large consumer of energy. We estimate, using ABARE government data, that in 2006-07 we consumed approximately 22 per cent of Queensland's total electricity. The Queensland resources sector is also a very large sector within the Queensland economy, currently employing one in eight Queenslanders and contributing 20 per cent of Queensland's gross state product. We therefore have a significant interest in energy policy and to ensuring that we have continued access to reliable and affordable energy, which is an important source of competitive advantage in increasingly competitive global commodity markets.

The sector's largest consumer is the aluminium sector in Gladstone, which is the Boyne smelter, and the copper and zinc smelting and refining activities in the north-west, predominantly Xstrata. The north-west is currently an isolated electricity network not connected to the NEM or the grid. This is an issue, as energy is increasingly scarce and expensive and is impeding the development of this very highly prospective region. A number of proponents are currently considering options to develop a powerline from Townsville to Mount Isa, which would provide access to the national electricity grid. To this end, we welcome the ALP's climate policy announcement last Friday and the commitment of $1 billion nationally to assist with the cost of transmission infrastructure that would connect renewable energy to the grid.

When discussing renewable energy and what government policies might be considered to pursue them, we think that it is important to take some learnings from the previous MRET and today's RET. Both of these policies have the dual objective of renewable energy development as well as greenhouse gas abatement. However, these objectives may not favour Queensland. The Access Economics report for the Clean Energy Council at the height of the CPRS debate last year indicated that Queensland, even under the most favourable carbon setting, may not enjoy very high employment generation from a renewable sector. Furthermore, as a greenhouse gas abatement measure, the RET also performs quite poorly, that is, and as Treasury modelling showed, again under the CPRS, the RET achieves potential emission savings at a cost of around three times what a carbon or market based mechanism would achieve.

The QRC believes that reconciling economic growth and the need for affordable and reliable energy with the need to reduce greenhouse emissions represents a tremendous global challenge. To that end, the QRC and the minerals sector nationally recently agreed to an energy and climate change policy position. This recognises this challenge. From this policy, the sector supports three main policy pillars to drive a comprehensive, least-cost and measured transition to a low-emissions global economy. We must have a global agreement on greenhouse gas emission abatement that includes emissions reduction commitments from all the major emitting nations. We have a very high preference for a market based mechanism that promotes the abatement of greenhouse gas emissions at the lowest cost while minimising adverse social and economic impacts whilst also preserving the competitiveness of the traded commodities sector. We also call for substantial additional government and industry investment in a broad range of low-carbon technologies and adaptation measures.

The resources industry believes that there will be a need to deliver a suite of renewable and non-renewable energy sources to meet our significant future domestic and global energy requirements and to lower greenhouse emissions. The significant distinction, though, is that, unlike the RET, a broad market mechanism that provides a clear, predictable and long-term carbon price will in turn also provide clear, predictable and long-term incentives to allow investment in low-emission technologies and, importantly, to meet climate targets at least cost. It would therefore be of concern if Queensland were to bring into effect an additional distortion into the energy market by imposing an explicit state renewable target.

We also recognise that in both the global and domestic context a carbon price alone, at least in its early implementation, is unlikely to be sufficient policy to tackle the array of national, sectoral and technological circumstances and challenges. In particular, there will be a need to stimulate research and development and deployment beyond that that would ordinarily be delivered by the private sector. In short, and in closing, the QRC's position is that all governments should tread with extreme caution in mandating for additional renewable energy supply due to the cost impacts on the traded sector.

CHAIR: Thanks very much, David. We are hoping that we might be able to ask you a few questions. Who would like to start? Chris?

Mr FOLEY: David, your submission does not seem to agree with other existing government policies and initiatives to encourage or support renewable energy. Are there other policies or approaches to encouraging renewable energy that your council would support?

Mr Rynne: As outlined, we support a carbon price. We do want a carbon price and we think that a market based mechanism would achieve greenhouse gas abatement at the lowest cost. We also think, even with a carbon price, we are still going to get significant market failures. So there will be a need for a government to intervene to stimulate research and development and deployment of technologies.

Mrs ATTWOOD: Your submission raises concerns about the impact of renewable energy on Queensland jobs—presumably in coalmining and coal fired power stations. Wouldn't any loss of jobs in these industries be more than offset by the growth of new jobs in the growing green energy sector?

Mr Rynne: We do not think there will be any job losses in our sector per se from renewables. That is not what we are saying. What we are bringing to the committee's attention is that the job creation from an enhanced renewable energy sector in Queensland may not deliver the tremendous amount of jobs that we may believe. That is simply the point that we are making. I do not think that we are going to get jobs displacement in the coal sector if we have a greater renewable sector.

Mrs ATTWOOD: But not in the immediate future?

Mr Rynne: No, I do not think so. I think there is enough scope there and enough demand. There will be a full suite of options that will hopefully grow.

Mr FINN: You mentioned that the council supports a price on carbon. Do you think a price on carbon can work without also having a renewable energy target?

Mr Rynne: I think that is an interesting point. I think we have had report after report—the Wilkins review and Ross Garnaut—that have said, 'Really if we have a carbon price injected into the Australian economy we probably don't need a RET. We do not need that safeguard.' That has been proven by independent reports pre and post the CPRS. So there seems to be enough evidence on the table to say that these are not indeed complementary measures and, perhaps if we do get a fully effective market based mechanism, hopefully the market will start to work.

Mr RYAN: David, looking forward for a time line, there is probably much regulatory uncertainty at the moment about whether or not there will be carbon prices, emission trading schemes and the like. Do you think that there needs to be a transition period where more investment or more focus goes on to alternatives like gas or some of the other nonrenewables but less carbon-intensive energy sources?

Mr Rynne: I think we are starting to see governments take that step. We saw some policy on Friday at the federal level where, effectively, all new coal fired power stations will not be able to occur unless they are CCS ready or they meet very rigorous emissions standards. So I think the regulators are on to that and that will force, by default, more gas to the market for base and peaking capacity

Mr RYAN: With that, do your council and your members have a buy-in with the transitional period? Is there much investment from your members in carbon geosequestration or focuses on clean coal technologies?

Mr Rynne: Geosequestration is very, very important. The Australian coal industry does contribute a levy on every tonne that it sells and the Australian Coal Association does collect that levy. There is currently in excess of $1 billion there in that levy. It is a voluntary levy and that is used to propel the deployment of full scale demonstration CCS plants in Australia. So the industry is on the front foot. Governments, both state and federal, are supporting the three main CCS projects that we have going in Queensland at the moment. They do have some problems but they are not insurmountable problems. More money does need to be thrown at CCS and that needs to come from private and public sources.

CHAIR: Are there any more questions from the committee? David, because the committee does not have any more questions, were there any final comments that you would like to make while you have the opportunity?

Mr Rynne: I think we should be cognisant that the resources sector is very energy intensive and that it is susceptible. These policies, if not done right, will have an impact. So we have to tread very carefully. The industry is committed to a lowering of its greenhouse gas signature, but we have to walk that delicate balance between doing that and ensuring that we protect the competitiveness of the sector.

CHAIR: Thank you very much for your time today. We really appreciate it. We wish you well and we look forward to perhaps talking to you again in the near future.

Mr Rynne: Thanks very much.

CHAIR: All the best. Ladies and gentlemen, we are going to break for lunch. We will reconvene the hearing at 1.15 pm when our next witnesses will be from local government. Thank you.

Sitting suspended from 12.29 pm to 1.15 pm

CHERRY, Mr John, Executive Director, Council of Mayors (SEQ)

JORDAN, Mr John Patrick, Manager, Natural Environment and Sustainability Branch, Brisbane City Council

WALLACE, Miss Michéle Kara, Project Manager, Council of Mayors (SEQ)

CHAIR: Welcome. We do appreciate you coming in today. We are grateful that you made a submission to our inquiry—one of 61. There has been a fair bit of emphasis on this committee and we are very grateful for that. We would appreciate it if you could make a brief opening statement and then we would be very keen to ask you some questions. Who would like to start?

Mr Cherry: I will start and then I will allow our largest member, Brisbane City Council, to make much more intelligent statements than I can give. The Council of Mayors represents 10 of 11 large councils in South-East Queensland—around about 2.7 million people. The mayors decided early last year that they would establish renewable energy as one of their key priorities for work for the next 12 months. At the time we were looking at the CPRS breathing down our necks within two years. You would be aware, as much as I am, about the politics of that at the moment.

The key question that the mayors wanted to look at was the question of aggregation of demand. One of the key strategies they wanted to look at was how do we look at using the potential purchasing power of the large councils in South-East Queensland to actually kick-start demand for a renewable energy and, in turn, kick-start the bring forward of development of baseload generation power. One of the key questions with getting a serious, large scale renewable energy industry running in Queensland is how do we move from the level we have been fiddling at at the moment—and a lot of the state government policies are around demonstration projects, small projects, local research and R&D—to actual baseload generation. Because the work that has been done by at least three of our councils—by Redlands, by Gold Coast and by Brisbane—looking at the cost-effectiveness of small local level, demonstration level projects versus large scale baseload projects—if we are really going to make this industry work, the most cost-effective way for councils to do it is to buy baseload power.

At the moment there are essentially very few baseload power generators in Queensland. We wanted to look at whether we could use our purchasing power to move forward to develop a baseload capacity. The total actual aggregated demand of the councils across South-East Queensland is around 339 gigawatt hours per year in 2010 rising to around 504 gigawatt hours by 2030. Those sorts of figures are enough to actually justify pretty much all of the demand for a baseload power station the sort of size that AGL is considering for some of their wind plants out in the Darling Downs region. The question for us is trying to work through how do we turn that into a product.

One of the very hard questions for councils across-the-board in shifting from black power to green power is how much will that cost their ratepayers. That is the key question. At the moment green power is around about 40 per cent more than black energy, but on some of the projections, with the expected increases in costs of black power we have seen over the last few years and also with the expected reduction in the costs of green power production, at some point in the next 10 years those two costs curves will narrow and almost certainly cross each other. The best projection we could make, even in the absence of a CPRS, would be that over a 20-year period the councils would probably save about two per cent on their total power bills, but you would be offsetting short-term costs for long-term gains and you would appreciate, as elected representatives, it is very hard to justify that to your electorates.

One of the challenges for us is, obviously, how do we actually start to move in that direction to get baseload power happening in our region. Councils are looking at all of the various work which Michéle's project in association with AECOM has actually put together and are now crunching the numbers as to how that might fit into their budgets. At this stage we have no commitments other than the commitment from Brisbane City Council. There are climate change management plans from both Sunshine Coast and Gold Coast councils which will consider in the future the question of renewable energy. I think those have great options, but at this stage their priority is more in the energy efficiency area rather than the purchase of green power. Brisbane City Council has the most advanced program, which I am sure John can talk to.

The final thing I want to mention, which is worth mentioning in our space, is the question of turning waste into renewable energy. It was not covered in our submission but it is a very important one because since we put in the submission obviously the state's waste strategy has been released. One of the huge potentials there is the third element of the waste strategy, the $90 million that has been allocated for a green futures fund for initiatives within the department of sustainability. At this stage the department is talking about using that for purchase of national parks. The Council of Mayors is totally opposed to that. We believe that all money raised in the waste levy should be hypothecated back to expenditure on waste. One of the real opportunities which you could have here is to use some of that green futures funding for actually encouraging and bringing forward large scale waste-to-energy initiatives.

There have been some fund initiatives in the past, as you would be aware, such as Luggage Point and the Rocky Point Sugar Mill which has a large waste-to-energy biomass conversion facility, and there are other options we could have. In fact, we could actually use some of that funding to ensure that across all of the waste facilities in Queensland we could actually have a renewable energy facility in place. That

would be a very, very good use of that green futures funding which is actually also consistent with the notion of hypothecation of that funding into that amount. That is probably my opening statement and I will hand over to John.

Mr Jordan: I guess from council's point of view everything that John has just said we support. We are a little bit more advanced than other South-East Queensland councils in that we are already paying in 100 per cent green power and that is an investment of in the order of $5 million over and above our electricity expenses otherwise. So the cost equation for Brisbane City Council to move to renewable energy is a lot different to the other South-East Queensland councils.

As a consequence of that, council is moving to test the market beyond just simply being a purchaser of green power. It wants to use its purchasing power to actually try to underwrite some level of commercial scale operation in South-East Queensland and that would be within two hours of Brisbane. We are very keen to have a locally generated solution rather than a nationally provided solution around green power purchasing.

Council also believes that in pursuing that testing of the market—and we envisage it will be about October when we will be in the market—it will be very keen to leave the door open for other South-East Queensland councils to follow suit. So scaleability of a commercial operation is important to accommodate growth and so forth. But it is the underwriting of investment that is important. There are plenty of examples of, as John alluded to, small scale experimental or just not quite there expressions of renewable energy around the place. We really need to think about what investment climate we create by virtue of our spending power and the scale of our custom to allow these commercial level plants to come to fruition. That is my opening statement.

CHAIR: Thank you very much. We are very keen to ask you some questions. If I could now open it up to the committee.

Mr DOWLING: John, in your opening you talk about waste to energy. Have you isolated the type of waste that you would be considering? You also talked about it being a fairly large waste-to-energy plant, I suppose, for want of a better word. Why has the Council of Mayors come to a large power plant through waste to energy as opposed to a series of small ones perhaps?

Mr Cherry: The analysis that has been done by the various people who have looked at this question has always been that a baseload renewable energy generator will actually be more cost-effective than small scale local plants. It is a no brainer. There are economies of scale involved with renewable energy and I think that would certainly work. Having said that, I think the small scale waste-to-energy plants at a local level can also be very cost-effective but they are not going to generate the sort of power that we need to soak up a large amount even of council demand let alone demand for the industry as a whole. The advantage of actually looking at waste to energy is actually twofold—one is you reduce the methane emissions from landfill sites as well as the advantage of converting that to power. So it is a twofold cost. Were a CPRS in place then obviously councils would be facing a significant cost if they did not reduce their methane emissions from landfill sites. So it is a twofold benefit in that regard.

Having said that, the modelling which has been done by various councils—the Sunshine Coast has done it most recently—is that by looking at waste-to-energy initiatives within their council areas you can get significant amounts of energy but certainly not anywhere near 50 or even 100 per cent of their energy needs let alone out into the community.

Mr DOWLING: Your definition of waste is purely rubbish type waste, not human waste?

Mr Cherry: Well, I think there are a number of options there. I think Brisbane at Luggage Point does have methane collection off the Luggage Point treatment plant, so there is obviously that option from sewage works. If we were looking at a CPRS, obviously the methane emissions from sewage treatment works would be a significant issue for our water companies and obviously there are options there but they are expensive to put in place. Methane is obviously easier to collect from a landfill site and there are very low-cost mechanisms for collecting the bulk of that already in place in councils like Gold Coast, Logan and I think also Brisbane.

The third area is actually burning of waste, which occurs at Rocky Point Sugar Mill and other places. That one tends to be a little bit more controversial, particularly in a suburban context. It certainly is another option that could be looked at. So the organic waste at landfill sites can be collected fairly simply through proven technologies. You can collect methane off human waste. The third one, which is a bit more controversial, is the burning of biomass and that is another opportunity.

Mr DOWLING: Just with the biomass, are you talking about green burning or the solid waste from sewage treatment plants?

Mr Cherry: I am not familiar with the mechanism used at sewage treatment plants. Maybe, John, if you could talk to what you have at Luggage Point.

Mr Jordan: I am not a technical expert.

Mr Cherry: We can get you a bit more information on those options.

Mr DOWLING: Thank you.

Mrs ATTWOOD: I just want to talk a little bit more about that large-scale waste to energy initiative. Have you any idea of how much this would cost, funding wise? Have you got down to the detail about working it out?

Mr Cherry: We have not got to that stage—there are two questions there. One is the general question of the capital cost of developing a large-scale wind plant for example. Of the current renewable energy technologies that are out there, wind power is obviously the cheapest and wind power is obviously the most mature technology. Queensland, as you know, is not the best place to develop wind farms. However, there are still areas of Queensland that lend themselves quite well to wind farms and AGL has some very advanced proposals at Coopers Gap and at Crows Nest for potential wind farms. They are quite large investments at several hundred million dollars apiece.

In terms of the sort of modelling work which I have seen, our best guess is you could probably purchase power from those sorts of plants for between 16 per cent and 40 per cent more than the current cost of black energy. Over a 20-year period, assuming that black energy continues to rise by the sort of cost increases we have seen in recent years, there will be a point at which it crosses over. The wonderful joys of renewable is obviously that all the cost is capital. So the cost from then on becomes a constant cost, whereas with coal based energy those costs are going to continue to rise over time, even in the absence of a CPRS. At some point they will cross over. Our guess is that in the first three years—if we did go to full purchase 100 per cent renewable—it would add about 16 per cent to our energy costs, but over a 20-year period there would be a two per cent reduction.

Mrs ATTWOOD: I understand that. However, I am not talking about wind power; I am talking about your idea about large-scale waste conversion to energy? What about capital costs for that and how much would it cost to actually create—

Mr Cherry: I am not an expert on that.

Mrs ATTWOOD: Okay. I just thought you would have gone into it.

Mr Cherry: That was not within the scope of our aggregated demand question, but certainly we have been looking at, more generally through our waste management projects, some of the questions of how we could actually look at reducing our emissions. There has been some work done within councils on that, but I am just not across that.

CHAIR: Are you happy to ask them to provide it?

Mrs ATTWOOD: It is probably a lot more work to try to get that sort of information.

Mr Cherry: I think the Sunshine Coast has put in a submission to you.

CHAIR: Yes.

Mr Cherry: They recently released their regional waste strategy. I think that might deal with some of those questions. Probably the most recent work has been done at the Sunshine Coast.

Mrs ATTWOOD: We will have a look at that. Thank you.

Mr Cherry: There was one small comment I did forget to raise. We have been in discussions with the Office of Clean Energy over the course of the past year and are keeping them well briefed on our project. One of the things which we were hoping is that if we do ever move to a point where we are looking at going to market for aggregated renewable energy, we would hope that we could actually expand the size of the buy by doing that in partnership with the state. The potential for the state to leverage even part of its spend on energy by buying baseload renewable energy—these are the sorts of options. If we want to get baseload renewable energy happening in Queensland, doing that with cooperation between both levels of government would be the way to make it happen. That spreads the risk for both levels of government.

Mr DOWLING: In your opening comments, John Cherry, you said three councils had been supportive of this strategy of the waste to energy initiatives and you named the three councils. One was Redland—obviously it is my home range and my ears pricked up. Who were the other two and why have the other seven councils not signed onto it, or did I misunderstand something?

Mr Cherry: Our project is in mid-project at the moment. I was saying that three councils have fairly advanced climate change policies which they have adopted. Brisbane is obviously the most adopted one and is out the front, and John has spoken to that. As you know, they are moving to a large buy of green power. The other council is Gold Coast council, which adopted a large climate change policy last year including some significant funding. At this stage their policy is looking predominantly at giving priority to energy efficiency measures in the first instance. They are looking at renewable energy buys further down the track. The third big council that has been doing a lot of work has obviously been the Sunshine Coast, which has recently released some policy work. Redlands did some work some time ago. You would be aware they commissioned a consultant to look at the question of renewable energy options locally and came to the same view as the work which was done at the Gold Coast, that it was more cost effective to look at baseload options.

Mr DOWLING: In relation to the Council of Mayors, the 10 members—and it may be something that is better targeted through the Local Government Association. Why is it that the councils appear to be working individually on this—and that is probably wandering off, so I will take direction from the chair if that is the case—that they have not worked as a whole in South-East Queensland to develop one policy around renewable energies, around their climate targets et cetera?

Mr Cherry: There are probably three parts to that question. One is obviously that this stuff costs money and obviously that is a commitment that each council has to make. As I said, Brisbane has the most advanced commitments and the Gold Coast has probably the next most advanced policy and Sunshine Coast is rapidly catching up. All mayors through the Council of Mayors have committed to the project I am talking about here. In fact, we have three projects working in this space. The renewable energy project which I am talking about today is about aggregated demand. Our Regional Waste Management Project is about looking at better management of waste. That will include both regional solutions as well as council solutions, but obviously it is an ongoing discussion. The third area that we were working on is the regional carbon sink, which is the question—particularly when the CPRS was alive—of trying to work out if we could not reduce our emissions and how we actually offset them through the planting of trees. Councils have already committed, through the Council of Mayors, a couple of hundred thousand dollars on developing regional carbon sink proposals.

Inevitably, the solutions which we are trying to present to our councils are a combination of things which can be done collectively such as aggregated purchasing of power and things which could be done individually such as those local based solutions such as waste to energy initiatives on their own facilities. The other new element of that is obviously the creation of the water companies, which will regionalise solutions about looking at some of the waste to energy options coming out of sewage treatment plants as well. I do not know, John, whether you want to supplement that.

Mr Jordan: No, that is fine.

Mrs ATTWOOD: This could go to either BCC or the Council of Mayors.

CHAIR: Or both.

Mrs ATTWOOD: Or both. In your submissions you suggest that a potential area of influence by the Queensland government could include fast-track permit and planning approvals for new renewable energy baseload stations. Could you give the committee some examples of the timeframes for RE projects to get approval under the current system of approvals? Can you also suggest some specific changes that would be required to fast-track the assessment process? Thirdly, can you give the committee an idea of costs and time frames required to secure approval for a medium- to large-scale RE generating project?

Mr Jordan: Look, I cannot give any specific indications as to the detail and the time frames. I know that the time frames and the complexity of the regulatory environment in terms of approvals is something, for example, that the Office of Clean Energy in our discussions about going to market has indicated is a space that we need to be very careful with in terms of the lead time to actually get a plant operational, and they have certainly offered their assistance to Brisbane City Council to navigate through that. That whole regulatory environment—it does not matter whether it is in a planning sense or whether it is in a market sense in terms of carbon trading et cetera—is a very complex set of arrangements that needs to be navigated through. That is really all I can say on that. I cannot give you an indication of specific responses to your questions.

Mr Cherry: Similarly, because it was in my submission, I do not have specific instances for you. I can try to find out whether we do have any. I think it was a general comment that declaring these projects to be state significant, getting the Coordinator-General involved, working in partnership with councils, we have actually developed some better responses. The lead times on even the two big baseload stations that AGL has been proposing have been quite substantial. One of them is actually now approved and the other one is still in the planning process. They have been going for some years. Certainly, when we get into the areas of waste to energy, which are more local level things, they can also become quite complicated because it involves waste and it is also closer to urban areas. It is really a plea for much closer cooperation in terms of trying to make these things happen on the ground.

Mrs ATTWOOD: Trying to make them a bit quicker I suppose. The more you do, the quicker they get eventually.

Mr DOWLING: John, a BCC question initially and then a part two through the Council of Mayors. Do you know what portion of Brisbane City Council energy is renewable at the moment and then the same question to the broader Council of Mayors, and I appreciate you may not have that off the top of your head, and I do not recall picking it up in the report. Redlands I think used to have five or near 10 per cent as a target, moving up obviously. How are the other councils travelling?

Mr Jordan: From 1 July Brisbane City Council is 100 per cent green power.

CHAIR: Congratulations. Well done.

Mr Jordan: And prior to that, 50 per cent green power.

Mr DOWLING: Hell of an example.

Mr Cherry: A very good example. I do not have that figure here. I think we did actually—did we have it? Do you want to talk?

Miss Wallace: We have individual information on each of the councils in some information put together by our consultants. John has spoken to Brisbane. Gold Coast has nothing at the moment, but they have a step process over the next 10 years. Ipswich has indicated none at present and it is the same with Lockyer. Logan has 20 per cent green power in a number of community facilities but is looking at exploring

that further this year. Moreton Bay has no current policy as do Redlands and the Somerset. Sunshine Coast has commitments in the future but they are finalising their carbon neutral plan, and there is no information on Toowoomba. Scenic Rim has a policy of 10 per cent renewable energy beyond 2012 subject to budget.

CHAIR: Just on that green power—a question for you, John—why is green power more cost effective than feed-in tariffs?

Mrs ATTWOOD: Which John?

CHAIR: BCC, my apologies.

Mr Jordan: I do not believe it necessarily is. I am not the expert in terms of the head-to-head comparison of those. I think the feed-in tariffs are one consideration and they relate to a smaller scale repeated many times. Green power is something that in the current marketplace allows Brisbane City Council, for example, to satisfy its large-scale demand for a renewable energy source. The cost efficiency of larger commercial plants I think far outweighs the feed-in tariff, small implementation at a residential/ local sort of area.

Mr Cherry: It would be worth the committee actually talking to an expert on energy engineering on these questions. The actual energy losses that go from a photovoltaic cell on your roof into the home are phenomenal. Something like 60 or 70 per cent of the energy is lost from the roof down into the home. It is quite extraordinary. With a baseload plant they can get a much more efficient conversion of energy. Even though you are still going to have transmission losses along the transmission network, the actual energy losses are much lower. It is one of the reasons why, in looking at the question of, say, photovoltaics on the roof and feeding in through those or other options, the baseload comes up so much more efficiently.

In fact, earlier in our discussion the mayors had a discussion about whether we should be promoting rebates on photovoltaics in the roof and those sorts of questions. But the more you looked at the economics of it, it really makes more sense to be putting rebates into big baseload things and reducing the upfront price of green power. Certainly that would be the suggestion that we would be making to you.

Mr Jordan: I have just found some figures from our submission that I can give you. Green power costs on average $50 a megawatt hour, whereas the feed-in tariff costs the community $400 to $600 a megawatt hour, in terms of the costs back into the overall system. Green power costs are borne by the customer alone, whereas feed-in tariffs are subsidised by the whole community. You can actually turn that around to ask the question: is there a case for incentives for those using green power as a solution?

Mrs ATTWOOD: Back to the BCC, and congratulations on your 100 per cent green power achievements. Can you give me some information on how you achieved that and what was the cost of achieving that?

Mr Jordon: The cost for this financial year is budgeted at around $5 million above our black power purchase. How it has been achieved is simply a process of actually working out, in the context of the reporting legislation for greenhouse emissions and following through that model, what our energy use is and factoring in a purchase arrangement based on that energy use. Obviously, we adjust periodically throughout the year based on actuals. We start off with an estimate. You don't know your actual energy consumption upfront, so the process is that on a quarterly basis we will analyse our actual consumption as opposed to the estimate, and adjust our purchase accordingly.

CHAIR: Since there are no further questions from the committee, would any of you like to make a final point before we adjourn for the next witness?

Mr Cherry: I have just a very quick comment, that we welcome this inquiry. The Council of Mayors is looking at a partnership approach with the state. We have been working very effectively with the Office of Clean Energy, but as we get to the crunch time of trying to turn these discussions into more realistic programs on the ground, we will be looking for more detailed commitments from the state. There is a chance to develop an industry in Queensland and we think that the state and local governments working together could actually help bring that forward by several years, even in the absence of a CPRS, because it is worth doing.

CHAIR: Thank you very much. Thank you again, John, for standing in at such short notice.

Mr Cherry: I returned from leave this morning.

CHAIR: That was very quick. We certainly appreciate your comments. We are grateful for the time you have taken to be part of this hearing. We wish you every success in the future and look forward to maybe talking to you again in the near future. We will take a quick break.

Proceedings suspended from 1.48 pm to 1.57 pm

CRADDOCK, Mr John, Director, Clean Energy Australasia

REICHMAN, Mr Joe, Managing Director, Clean Energy Australasia

CHAIR: We have a 15-minute window of opportunity, so we will not waste the time. Gentlemen, you have been sitting diligently for the whole day so we thought we might get some information from you. We are not right across geothermal RE programs. If you would like to state your names and positions for Hansard, at least we will get something on record about your activities.

Mr Craddock: My name is John Craddock, a Director of Clean Energy Australasia. We are a geothermal energy company that, in fact, has exploration tenements in Queensland. My colleague is Joe Reichman. He is the Managing Director of Clean Energy Australasia. First of all, I must say thank you very much for the opportunity to address you because we are very passionate about geothermal energy and its capacity and capability in Queensland. A lot of people will not know that Queensland has the largest potential for geothermal energy of any state in Australia. Not only that, it is close to the surface. One of the big difficulties about geothermal energy—

CHAIR: How close to the surface? What are you talking about?

Mr Craddock: Within one to 1.2 kilometres depth. I will just give a little bit of background, and in our submission we described this a little bit. Geothermal energy exists right throughout the world. What you are looking for, in terms of accessing geothermal energy, is an insulating blanket that is actually stopping the energy from escaping at the surface. A very good insulating blanket is, in fact, the Great Artesian Basin. That is actually stopping and creating a large temperature gradient close to the surface and you can access that a lot better than in most places around the world.

For instance, as you probably know, Geodynamics is in the geothermal energy business in South Australia, and so are we. We have tenements there as well. They are drilling down to about 4,000 metres or four kilometres, compared to our access regime which would probably take us about one kilometre to one and a half kilometres into the granite underneath the Great Artesian Basin. The big issue in relation to drilling is that the deeper you go the more expensive it is. That is an exponential process. Every foot gets much more expensive the deeper you go. Therefore, in terms of cost, the potential for geothermal energy is huge in Queensland.

There are a couple of other things that we raised in our submission that we think are very important and that are missing the boat at the present time. One of them is the issue of intermittency. At the last presentation here I heard a gentleman talk about baseload wind energy. That is just not true. There is no such thing as 24 by seven wind energy availability in Queensland, or anywhere for that matter. The issue in relation to intermittency is that you have to have the infrastructure available to supply power to the community when that energy is not available. In fact, you are doubling up on your infrastructure in relation to what you need for that alternative energy business. Geothermal energy is baseload, 24 by seven. It is the only renewable energy form that can give you baseload power.

Mrs ATTWOOD: Does it ever run out? How long does it last once you have dug—

Mr Craddock: It will last for about one million years. The issue is that you are getting it from the centre of the earth and, in fact, what is happening down there—and Joe is much better at physics than I am—is that you have very low grade radioactive decay, which is heating up the rock. In fact, you have an underground nuclear power station that you are using to provide the heat that you are extracting. Not only that, but within the earth's mantle and the liquid core there is a frictional process going on that is also creating heat energy, besides the internal energy of the earth.

In fact, we are looking at two nuclear power stations. One is a few million kilometres way out there and it shines every day, and there is another one underneath the earth. You cannot get away from it. They are both pretty benign. They do not produce radioactive fallout, radioactive issues and all that sort of thing. They are both pretty benign. Our process is to circulate water through two well systems with fractured rock in between. In actual fact, it is a continuous closed circuit circulation process. You do not, in fact, get any losses; you do not, in fact, get any interaction between anything that is going on. It is pretty benign. Obviously everybody covers up their environmental issues that they have in relation to wind noise and all that sort of thing—

CHAIR: We are aware of that.

Mr Craddock:—but we have not come across too many really difficult environmental issues in relation to it. When we make this heat exchange underground we crack a rock.

CHAIR: You actually crack the rock?

Mr Craddock: We actually crack the rock, and there is a small seismic event. People say, 'It will create these huge earthquakes,' and that is rubbish. The petroleum industry has been fracturing reservoirs for years and years, and there is plenty of information or knowledge base about that sort of thing that occurs. You just do not have those things. In fact, in the situation that we are talking about we have to have the rock in stress so that, when you actually fracture it, the rock will move and leave open the fissures that you are going to pump the water through. Anyway, that is getting a bit technical—

CHAIR: It is very technical.

Mr Craddock: We could go on for hours about that.

CHAIR: I have a question about control. Because you are working so far underneath the surface, I am concerned about how much control you have over this as opposed to something that is on the surface that is easily seen.

Mr Reichman: The geothermal industry is basically an adaptation of the petroleum industry. I am a petroleum engineer by background and John has worked in the petroleum industry for many, many years. Basically the wells that we drill for geothermal are exactly the same as the wells we would drill for petroleum. The fracture stimulation of the granite—the hot rock—that John was previously discussing is exactly the same technology that we would be using in petroleum.

In my case and in John's case we have had a lot of experience in developing the south-west Queensland gas projects and on the other side of the border in South Australia the Moomba gas and oil projects, where we have been involved in drilling petroleum wells and the fracture stimulation of rocks that are readily adaptable to the geothermal industry. In fact, we will be taking that wealth of experience and simply adapting it to the geothermal industry.

Mr DOWLING: You have talked about doing the cracking and other industries having used that technology for years quite safely. My understanding is that they have not done it within the precinct of the Great Artesian Basin or that body of water. They have not exposed themselves to that risk. Am I right or wrong in that?

Mr Reichman: I would beg to differ. In fact, there is a significant petroleum industry, as you may be aware, in the Cooper-Eromanga basins. That extends into south-west Queensland and the north-eastern corner of South Australia where there have been thousands of wells drilled and hundreds of wells have been fracture stimulated. The Great Artesian Basin overlays the Cooper and Eromanga basins.

Mr DOWLING: Do they go to the same depth that you are proposing to go, or are they at the one to 1½ kilometre range?

Mr Reichman: No, the depth range of the petroleum industry is between one and 3½ kilometres. If we find it economically and technologically advantageous, we may go to those sorts of depths ourselves, but again I stress that having come out of the petroleum industry we are very familiar and very comfortable with both the drilling, well completions, the production and the fracture stimulation that will be required for geothermal because we have done that over the course of our working lives.

CHAIR: Are there any more questions from the committee?

Mrs ATTWOOD: It is worth looking into, that is for sure.

CHAIR: It is. The representatives from Powerlink have just arrived. Gentlemen, I thank you most sincerely for offering to fill that small gap that we had rather than waste the time. We obviously have a fair bit to learn with regard to your technology. Some of what you said was well over my head, but, as I said, the committee is relatively new and we have had to try to grapple with any number of renewable energy technologies. We wish you every success for the future and we look forward to perhaps talking with you again. John, I appreciate your passion for the industry. Thanks for talking to me and filling me in at lunchtime.

Mr Craddock: Thank you very much, Chair.

Mr Reichman: Thank you very much for the opportunity.

JARDINE, Mr Gordon, Chief Executive, Powerlink Queensland

MILLER, Mr Terry, Manager, Network Development, Powerlink Queensland

CHAIR: We appreciate the time that you have taken today to be here as a witness at our hearing. We are very keen to hear an opening statement from you and also to ask a number of questions.

Mr Jardine: Powerlink is responsible for planning, developing, operating and maintaining the Queensland high-voltage transmission grid, which moves electricity in bulk from the power stations where it is generated to the various regions in the state from where it is distributed by Energex and Ergon. Powerlink's grid is part of the interconnected national grid which covers Queensland, New South Wales, Victoria, Tasmania and South Australia. The transmission grids in all these states are subject to uniform national rules and national regulatory frameworks which are set and administered by national institutions: the Australian Energy Market Commission, which makes the rules, and the Australian Energy Regulator, which applies and administers the rules. One of the rules is that transmission grids must provide open and non-discriminatory access to generators that wish to connect, regardless of their fuel source.

Of possible relevance to the committee's deliberations is a new rule currently being formulated by the Australian Energy Market Commission known as the scale efficient network extensions rule, abbreviated to SENE. The aim of this proposed rule is to facilitate the extension of the grid to geographical locations where clusters of new generators are likely to be developed and to size that extension to provide the ultimate expected long-term capacity. The need for the SENE rule was driven by the recognition that many quality renewable energy resources are located well away from the major population centres.

We also note the Prime Minister's announcement on Friday of Commonwealth funding contributions for grid extensions to remote renewables. That announcement stated that the implementation details would be worked out with these national electricity market institutions such as the Energy Market Commission and that those grid extensions that are going to get funded would require substantial co-contributions from other sources. All of that indicates to us that it is likely to be built into these SENE rule change arrangements should the Commonwealth government be re-elected.

CHAIR: Mr Miller, would you like to make an opening statement?

Mr Miller: No.

CHAIR: Thank you very much, Mr Jardine. We will now open it up to questions from the committee.

Mrs ATTWOOD: Would you mind giving the committee an idea of the proportion of the state's electricity users that receive power through your network or grid?

Mr Miller: Pretty well a majority. I do not know the exact number because that happens within the distribution network, but it would be in the order of the high 90 per cent—towards the 98, 99 per cent mark. There is some energy generated within the distribution networks called embedded generation, which is at the very small end of the total energy generated. I do not have the numbers with me. I can find that out if you need to know it, but it is fairly small.

Mrs ATTWOOD: We might get that from you later on if that is okay.

Mr Miller: Yes. We will get that out of our annual report.

Mrs ATTWOOD: Can you also give us an idea of the proportion of electricity charges to consumers that is the cost to operate and maintain the network or grid?

Mr Jardine: It is typically of the order of around 10 per cent on average. So around 10 per cent of the average electricity bill ends up paying for the transmission grid.

Mrs ATTWOOD: That is pretty reasonable, isn't it?

Mr Jardine: We think it is modest, given the geographical extent of the grid.

Mrs ATTWOOD: I can understand that.

Mr RYAN: One thing that I have been very interested in is how we expand the transmission network so that we can get out to some of the remote locations which, for Queensland anyway, is where we are probably most rich from a renewable energy generation point of view. It was very interesting to hear about the SENE stuff and the Prime Minister's announcement. Can you give the committee some idea about costings to expand the network to places like Western Queensland? Is it billions, is it hundreds of millions or is it a dollar?

Mr Jardine: If you are looking for a ballpark figure, it is of the order of a million dollars a kilometre. That is probably the ballpark figure to use on those calculations. The SENE arrangements that are proposed are designed to identify which grid extensions—and these things are being done nationally—ought to qualify for those sorts of arrangements.

The criteria involved are going to be around there being willing foundation generators in those remote locations willing to pay for some of the grid extension. We saw the other day the announcement of the Commonwealth perhaps being able to make a contribution as well. In the short term, the remainder of the cost of those extensions will be borne by electricity consumers.

Mr RYAN: I notice that there was also a change in regulations, maybe it was in the middle of this year, with the interconnection cost to the grid now being borne by the new generator rather than necessarily by the retailer, the end user?

Mr Jardine: It has been a longstanding arrangement that the payment for the assets that actually connect the generator to the shared grid are paid for by the generator. That is a longstanding arrangement. So the connecting generator pays for those connection costs. This is where the challenge comes in for the remote ones because the costs are pretty large given the large distances. That is where the SENE rule is targeted.

Mr DOWLING: With all the new players coming into the market, what do you see as the major impediments—obviously it is partly dollar driven when it comes to the cost of those entities being viable—what are the government impediments that are in the way, what are the business impediments in the way? If you were the Premier tomorrow, how would you change the electricity structure to get this thing to flow right and to make that transition to renewable energy?

Mr Jardine: If you look at the arrangements that are set up at the moment those arrangements are all national. The 20 per cent mandatory renewables is a national target. One of the design criterion behind that is the aim of trying to source that 20 per cent in a way that represents the least cost to consumers for that particular bundle of renewables.

The way the mechanism is set up is that the legal obligation is on the retailers. So the retailers are really in the driving seat in terms of where the renewables get sourced from. They have the legal obligation to buy the renewables. From what we can see, most of the retailers are running a buy or make strategy. A lot of them have their own portfolio of renewable generation that they can develop themselves or they can buy it off third parties. The whole thing is set up to run on the basis of least cost sourcing.

I am not sure why or what direction you are trying to take that other than least cost sourcing for consumers at large. That is where it has been set up to run nationally. The challenge has been that some of these quality renewable resources are a long way away. This is where this SENE rule change has come in—that is, to see whether there is a way of accessing those or at least accessing some of them. The rule change is headed in the direction of trying to find the ones that are closest to economically efficient, if that makes sense.

Mr Miller: One other barrier is land rights. For remote connections generators need to build their connection infrastructure on easements. The easements need to be secured in advance of construction. In Queensland we probably have one of the more streamlined easement acquisition processes either through some of the government agencies or through the department of infrastructure with significant state designation. It would take at least two years to acquire easements under that process in round terms. That is a barrier for an investor before they get a project up and financed and before they can actually start construction. I think SENEs will give an opportunity for easements to be acquired earlier. They will be identified as hubs and allow easements to be strategically acquired in advance, which I think may be again lessening some of the barriers.

Mr FINN: This is a bit of a hypothetical. If you were advising government and we were looking at hitting the renewable energy targets as fast as we can, should we be trying to find ways to find the $700 million to get transmission out to the hot rocks or should we be buying a wind farm in South Australia as the Queensland government wind farm in South Australia and hooking it up to the grid where it is close? What is the best spend now to get the best result now whilst we develop the technology that goes around those other renewables?

Mr Jardine: A lot of the things that are happening are driven by the notion of getting the most economic resources earliest. The most economic ones are the renewables that are not as high cost as others. In Queensland that means sugar mill biomass predominantly. There is limited wind resource in Queensland. If you look at other states like South Australia there is a lot of wind resource being developed relatively close to the grid. All the developments are relatively close to the grid.

If you are out there looking for the low-hanging fruit, then it is the renewables that are close to the grid that are generally at the lower cost of the renewables scale which in Queensland means biomass. In South Australia it means wind. We are already seeing that that is the trend. Those are the first cabs off the rank.

The other bit of advice we have given to the Office of Clean Energy is in relation to the Commonwealth government's Solar Flagship Program. The Commonwealth is going to part fund large scale solar. There are four short-listed proponents of that in Queensland and all four are relatively close to the grid.

Mr RYAN: There are a few sayings being used in the vernacular with the federal election going on. Do we really want to look at a big grid or do we want a sustainable grid? By sustainable grid, is it better to have a look at developing the resources we have closest to the grid and then maybe adding better battery storage capability than having a huge grid at a huge expense?

Mr Jardine: I am not sure where the economics will ultimately flow. The challenge in that regard is that the battery storage is pretty embryonic in terms of its development, and particularly in terms of large scale arrangements. I think the biggest advantage that the storage can bring, if and when it is developed to a commercial scale and commercial levels of cost, is that a lot of the intermittent sources can become

more viable in terms of supplying electricity—that is, things like solar which is intermittent and wind which is intermittent. The whole promise of the storage is to get those things to be able to provide load outside of their normal operating schedule.

CHAIR: We had a gentleman previously talking about the difficulties of intermittent renewable energy. I have been told that if you put every household onto solar your existing grid would not be able to cope because of the technical issues. Can you explain those technical challenges that the intermittent nature of renewable electricity sources present to your network?

Mr Jardine: I will let Terry talk about the technical side of that. If every household were on solar they would have blackouts on the cloudy days. One of the intermittency problems is that anyone who does put solar on their house still relies on the grid on cloudy days, rainy days and after three o'clock in the afternoon type usage. I will get Terry to answer that.

Mr Miller: I think that is probably the big issue. Because of the intermittency or the nonavailability at certain times then there will need to be grid support. I think the comments that people make about the grids not working effectively refer to distribution rather than transmission in that you are looking at reverse flows. At some times in the day there is power pushing out of houses into the grid against the flow of the system. For protection it looks in one direction. There are transformer tap changes that adjust voltages that are looking the wrong way. The system is set up for power to flow from the upstream grid down to the houses. If it flows in different directions the grid is not set up for that. That is a fairly big change. If it evolves slowly it is probably able to be changed rather than if it happened overnight.

From a transmission point of view I guess we are a bit more used to power flows moving around a bit. We have generators spread around the grid that are dispatched nationally on merit and on price. They actually move around. We do have power flows in different directions. We set our network up for that. It is probably less of an issue for us. If it happened overnight it would be a big change in the way the whole system is set up. If it happened gradually over time I think networks would evolve to cope with that. In the end, it is a question about what happens when it is not there. How do you manage that? There is probably a lot of grid there for standby at off-peak times for example.

Mr Jardine: In relation to large scale renewables, a similar thing happens in relation to seasonality. The South Australian experience with wind farms is that they get most of their wind in winter. In August the wind farms can contribute anywhere between 30 and 40 per cent of the electricity on any given day in South Australia. On a hot summer day in February they get very little wind and the wind farms are good for about five or six per cent. It is quite a difference.

Mr Miller: I have one other comment on wind. This is the South Australian and Tasmanian experience. They have a lot more wind than we would see in Queensland. A lot of wind generators use different technology to spinning generators. They are probably a less sophisticated technology and therefore the interconnector grids do not operate as effectively as the percentage of wind generation increases. They are called induction machines. The normal generators that we are used to at coal fire stations, gas fire stations and hydro stations are synchronous generators.

Synchronous generators are a lot more expensive. The wind for some reason needs that. I am not sure why the technology drives that. There are concerns in southern states and certainly standards are being raised. The bar is being raised in terms of what sort of plant is acceptable. There are a lot of issues out there in terms of what happens if all the generators out there happen to be wind and there is a drop in the wind. How does the system respond? Does it remain stable? Again, it is not a big deal in Queensland at this point in time because we are a bit sheltered from that. Most of the wind is in the southern states right now.

CHAIR: Is there a limit on how much of the state's power needs can be drawn from these renewable energy generators?

Mr Miller: With wind there are some hypothetical figures floating around like 15 per cent. That is a stability issue. I have heard some figures quoted. It is fairly intermittent. It depends where they are. If they are all in the one location you can get a gust coming through and then backing off. Something has to take its place. If you lose 50 per cent of your generation or 10 per cent of your generation in 10 minutes you need some other plant that can respond to that pretty quickly.

They are some of the issues that people are grappling with. We see in some of the European markets that they are highly interconnected. They have a higher percentage of wind and they are learning how to deal with those sorts of issues. Certainly there are technical challenges and there are some costs that come with that that people are learning about in terms of maintaining stable networks.

Mrs ATTWOOD: There is a lot of R&D going on around the globe in relation to renewable energy. As far as Powerlink is concerned, what sort of R&D are you tapping into and are you doing any projects of your own?

Mr Jardine: No, we do not do any research into generation. In fact, the rules around transmission are that we have to stay out of the generation space other than connect them, so we have to stay neutral—if you like, in the middle. What we do watch in terms of developments in terms of seeing what is coming is information out of organisations like EPRI, the Electric Power Research Institute, out of the US which is doing a lot of research into renewables and doing a lot of research into networks as well in terms of network response. We contribute to EPRI's research in a whole range of grid type areas, but we do get to see the research results that come out in the renewable space as well.

Mr Miller: You might be aware that the University of Queensland has a centre of excellence for geothermal research. I am actually on a reference committee for that because part of the thing they are looking at is how they connect remote stuff to the grid. So while it is about the technology for geothermal, there are some grid issues that they are grappling with. So Powerlink does sort of support that part of the project.

Mr RYAN: How much work are we doing at the moment from a Powerlink point of view on those long distance transmission connections? I imagine you have seen plans for geothermal in Western Queensland. Do you start doing strategic plans now and say that that will take us 15 years to get out there?

Mr Jardine: What has happened in the transmission network planning space in the last year or so is that that has gone national as well. The Australian Energy Market Operator has now got a role of producing a national transmission plan. We contribute to that, but the national plan gets published and developed by the national market operator. The first one of those is coming out later this year. We provide input in terms of where we think there are potential opportunities. With our non-discriminatory approach, we have to look at where there are opportunities for clusters of, say, gas-fired generators as well.

CHAIR: Just going back to the intermittent nature of these renewable electricity sources, is there a limit to how much of the state's power needs can actually be drawn from those RE generators?

Mr Miller: I cannot say that we have done anything theoretical. Right now we are nowhere near that limit. No, I would not guess a figure. When you are getting up into the 15 per cent to 20 per cent, I think that would create some issues. That would create some challenges, but it is not a number that we are anywhere near in terms of levels of intermittency.

CHAIR: We have a target obviously of 20 per cent in 2020 and we have kind of reached our 10 per cent fairly quickly. From all that we have read it is going to be a lot harder and a lot longer before we reach that extra 10 per cent, so I dare say that nothing is going to happen overnight. So I think you have a bit of time up your sleeve.

Mr Miller: In terms of the Solar Flagship projects, there were some that had a mixture of gas-fired stations and solar, because one of the objectives of that project was to try to develop less intermittency and more of a continuous output and there was a supplementary gas firing to drive that. So there are probably some options of managing reduced carbon output and a higher renewable content while still meeting the low patterns. There are other technologies like pump storage that people have looked at where it is like a big battery but you use water to store the energy rather than within a battery, and the Wivenhoe pump storage system in Queensland does that very thing of storing energy at certain times of the day and releasing it at other times of the day. So there are other technologies and I think in the end some of those innovative solutions will start to come to the fore as the percentage of intermittency increases.

Mr FOLEY: Can you just give us a lay description in terms of the solar PV units and the link that takes that back into the mains power, because my understanding is that in the Queensland system we use whatever we want to use and then any excess goes into the grid on the net feed-in tariff. In terms of the conversion unit, as it were, that puts it back into the grid, what is that in simple terms and can that be applied to other technology other than just solar? For instance, if you had wind generation at a domestic level, could you use whatever that unit is?

Mr Miller: It is probably a bit too sophisticated for that because we call it an inverter. It converts DC—

Mr FOLEY: It is just an inverter, is it?

Mr Miller: It converts DC back to AC whereas if you have a wind generator, because it is spinning, you have probably got the opportunity to get some form of AC straight from it. So it probably does need some electronics or control but not to the same sophistication as, say, solar conversion.

Mr FOLEY: So solar is just basically going into an inverter?

Mr Miller: Yes, and it is just reversing DC voltage and it gets inverted back to the mains.

Mr FOLEY: That is even simpler than I thought.

Mr Miller: Even the large scale solar thermals just have a whole lot of inverters.

Mr FOLEY: So it is virtually a sophisticated version of what you might plug into your car?

Mr Miller: Yes.

CHAIR: Do you think you will be ready to accept into the grid the 20 per cent by 2020?

Mr Jardine: I think we are going to be in a position to be able to connect these generators, as long as they can identify where they are going to be in enough time. As Terry mentioned, if they are away from the grid we have to go and get easements and that is a time-consuming process in its own right. But our expectation is some of this national planning that is being done is going to give us a bit of a view on where the renewables are going to crop up. The 20 per cent is an interesting topic in the sense that the only legal obligation is in the national scheme and it is a national target so that Queensland retailers can source it from anywhere. So whether 20 per cent turns up in Queensland is probably a moot point.

Mr Miller: Can I just comment as well in terms of planning for that. Historically, even before we were talking about carbon emissions, with coal generation it was an interesting exercise to plan for future coal stations because there is plenty of coal that is away from the grid. It has the same issue in that people develop lower quality coal next to the grid for the very same reason—to avoid the cost of connection. Part of our process was an annual process of understanding where the next coal plant would come along in the merchant sense. It is that process of being in contact with developers, understanding hubs and locations and planning for that. So it is a continuation of that particular evolutionary process.

CHAIR: We are questioned out. Would either of you gentlemen like to make a closing statement or have any final remarks?

Mr Jardine: No.

Mr Miller: No, I do not think so.

CHAIR: If not, we thank you so very much for attending this afternoon. We appreciate your input, and you have gone to great lengths to provide a very detailed submission which we are very grateful for. Obviously, as I said before, we are a new committee and we are still learning as we are going. We have learnt an awful lot today and, as I said, we are very appreciative of the time that you have taken. We wish you all the best and we perhaps look forward to talking to you again in the near future.

Mr Jardine: Sure. Any time.

CHAIR: Thank you very much for attending. That concludes our hearing. You were our last witnesses. I want to thank my committee most sincerely and my secretariat and Hansard for all of the effort that they have also put in today. I particularly want to thank the audience as well, and some of you have been here all day. It is wonderful that you have shown that interest. The transcript of today's hearing will be on our website as soon as we can finalise it. If you would like a copy of our final report, please give your details to our staff who are here today, either Rob Hansen or Grace Field. Grace is very new to our committee and we welcome her. I now declare this hearing closed. Thank you.

Committee adjourned at 2.38 pm