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SENATE

SENATE SELECT COMMITTEE ON WIND TURBINES

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MONDAY, 18 MAY 2015

CAIRNS

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SENATE

SENATE SELECT COMMITTEE ON WIND TURBINES

Monday, 18 May 2015

Members in attendance: Senators Madigan.

Terms of Reference for the Inquiry:

To inquire into and report on:

The application of regulatory governance and economic impact of wind turbines, with particular reference to:

- a. the effect on household power prices, particularly households which receive no benefit from rooftop solar panels, and the merits of consumer subsidies for operators;
- b. how effective the Clean Energy Regulator is in performing its legislative responsibilities and whether there is a need to broaden those responsibilities;
- c. the role and capacity of the National Health and Medical Research Council in providing guidance to state and territory authorities;
- d. the implementation of planning processes in relation to wind farms, including the level of information available to prospective wind farm hosts;
- e. the adequacy of monitoring and compliance governance of wind farms;
- f. the application and integrity of national wind farm guidelines;
- g. the effect that wind towers have on fauna and aerial operations around turbines, including firefighting and crop management;
- h. the energy and emission input and output equations from whole-of-life operation of wind turbines; and
- i. any related matter.

WITNESSES

ALLEN, Ms Sophie, Pre-Contracts Manager, Ergon Energy	1
ALLWOOD, Mr Trevor Allan, Private Capacity	57
CHEMELLO, Mr Gregory John, Deputy Director-General, Planning Group and General Manager, Economic Development Queensland, Department of Infrastructure, Local Government and Planning	16
DALTON, Mr Owen Leslie, Principal, Planning, RPS Australia Asia-Pacific, on behalf of RATCH- Australia Corporation Ltd.....	1
EDMUNDS, Mr David, EGM Network Optimisation, Ergon Energy	1
FINNEY, Mr David Hubert, Technical Director, RPS Group, RATCH-Australia Corporation Ltd	1
FORBES, Mr Vivian Richard, Chairman, Carbon Sense Coalition	47
GARGAN, Mr John Ernest, Private Capacity	57
GREENACRE, Mr Simon Espie, General Counsel and Company Secretary, RATCH-Australia Corporation Ltd.....	1
HALLENSTEIN, Mr Joseph, Project Development Manager, RATCH-Australia Corporation Ltd	1
HEWITT-STUBBS, Susan Jane, Private Capacity.....	57
JOHANNESEN, Mr Terry James, Project Development Manager, RATCH-Australia Corporation Ltd	1
LYONS, Michael, Wind Energy Queensland	57
LYONS, Mr Bryan Alwyn, Wind Energy Queensland.....	57
MARTIN, Mr Stephen, Private Capacity	57
McAULIFFE, Mr Jeremiah, Private Capacity	57
McGUIRE, Dr Geraldine Mary, Private Capacity	57
McPHERSON, Mr Geoffrey Robert (Geoff), Private capacity.....	36
NANGIA, Mr Anil, General Manager, Business, RATCH-Australia Corporation Ltd.....	1
PAGANI, Ms Marjorie Elizabeth, Division 6 Councillor, Tablelands Regional Council.....	27
PATTISON, Mr Peter, Senior Planner, Tablelands Regional Council.....	27
REYNOLDS, Mr David Gordon, Private Capacity	57
SCHWERDTFEGGER, Mrs Lee, Private Capacity	57
THORNE, Dr Robert, Private capacity	42
WALKDEN, Mr Colin William, Private capacity	47
WATKINS, Ms Krista, Private Capacity	57

ALLEN, Ms Sophie, Pre-Contracts Manager, Ergon Energy

DALTON, Mr Owen Leslie, Principal, Planning, RPS Australia Asia-Pacific, on behalf of RATCH-Australia Corporation Ltd

EDMUNDS, Mr David, EGM Network Optimisation, Ergon Energy

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GREENACRE, Mr Simon Espie, General Counsel and Company Secretary, RATCH-Australia Corporation Ltd

JOHANNESSEN, Mr Terry James, Project Development Manager, RATCH-Australia Corporation Ltd

NANGIA, Mr Anil, General Manager, Business, RATCH-Australia Corporation Ltd

Committee met at 08:30

CHAIR (Senator Madigan): Welcome. We acknowledge the traditional owners of the land on which we met and pay our respects to elders past and present. This is a public hearing and a Hansard transcript of proceedings is being prepared. I remind witnesses that in giving evidence today they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to the committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to the committee. The committee prefers all evidence to be given in public, but under the Senate's resolutions witnesses have the right to request to be heard in private session. We ask that witnesses give the committee notice if they intend to give evidence in private.

There will be an opportunity at 2.45 today for people who are not listed as witnesses on the program to give a short statement to the committee. This session will run for 30 minutes. There will be a strict three-minute limit on the statements. To participate in this session, I would ask that you register with the secretary. The order for speaking will be on a first come, first served basis. I would also mention to everyone concerned that the committee does have copies of your statements to the committee and we would appreciate if you keep your opening statements short so that we can get to questions and answers soon as we can. I would also like to make everyone aware that there is a TV camera here from *Today Tonight*. If anyone has a problem with being filmed in evidence, they should let the secretariat know.

I note that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. The committee has your submissions and I now invite you to make a brief opening statement and at the conclusion of your remarks I would invite members of the committee to put questions to you.

Mr Nangia: Good morning. My responsibilities include the overall management of greenfield development activities for RATCH. On behalf of RATCH-Australia, thank you for the opportunity to appear before the committee today. RATCH-Australia is owned by a major Thai power-generating company and a major Australian ASX listed public company. RATCH's operating assets include three gas fired power stations, one coal fired power station and three wind farms. RATCH also owns a portfolio of wind and solar development sites. These include the solar PV project at Collinsville and 50 per cent of the Mount Emerald wind farm project in the tablelands.

I would like to introduce my colleagues here with me today. Simon Greenacre is RATCH's general counsel and company secretary. Terry Johannesen is RATCH's project manager for the Mount Emerald wind farm. Joe Hallenstein is RATCH's project manager for the Collinsville solar PV project. David Finney is the technical director for the environment of RATCH's RPS Group, based in Cairns. Owen Dalton is the principal for planning for the RPS Group, also based in Cairns.

At the outset, I would like to emphasise that the construction and operation of renewable energy power stations stimulates growth in regional economies, creates long-term industries and jobs and community investment that complement existing agricultural activities in these districts. We are not alone in this view. Infrastructure Australia's northern Australia audit report released on 8 May noted that electricity generation is one of eight critical sectors for the development of northern Australia. It also found that electricity availability and higher cost remain major issues for residents, businesses and northern Australia. It went on to highlight high electricity cost or inefficient supply as a barrier to economic development in northern Queensland and recommended that electricity generation be better located to address this. I also note about \$5 billion was allocated by the

government in last Tuesday's budget for the development of infrastructure in this region and the rest of northern Australia.

I would like to give you an example of the economic impact of our Mount Emerald wind farm development. The construction costs will be in the region of \$350 million to \$460 million—\$100 million to \$150 million of this will be spent domestically; \$70 million to \$90 million of that is expected to be spent in the tablelands region alone. The construction phase of the project will be around 24 months. A range of skills will be required during construction. The majority of these jobs will be good quality, highly skilled technical jobs that attract highly qualified workers into the tablelands area.

Much of the domestic cost relates to the provision of foundations, assembly and the erection of wind turbines at the site, the construction of roads and the installation of electrical cables and equipment. During construction, it is anticipated that the project will create 60 direct and indirect equivalent positions in the tablelands region and a further 90 direct and indirect full-time equivalent positions in Queensland. Employment during the construction phase is expected to peak at around 150 to 200 workers.

RATCH-Australia will work with the construction contractor to maximise local employment opportunities during the construction phase of the project. It makes good economic sense to maximise the local workforce. Expenditure during operations is expected to be between \$13 million to \$70 million per year. Anticipated employment positions for the operation phase include: 10 to 12 maintenance and service technicians; one site manager; a site administrator; four park rangers, part time, sourced from the local Indigenous community; two cleaners, groundsmen and handymen.

Experience gained from other wind farms around the country show that technicians who operate Australian wind farms are local, who commute to work on a daily basis. At the time they were employed, the majority of these technicians did not have the skills required to operate and maintain wind turbines, but they were trained and reskilled to do so.

I would like to raise the issue of cost of power in northern Queensland. The Infrastructure Australia audit report referred to previously states that, for industry, there is an electricity price differential between northern Queensland and southern Queensland of up to 25 per cent. This is the result of electricity prices reflecting the cost of supply. Having most of the state's power generated located down south, means higher transmission charges in the north of the state because of transmission losses. For residential customers, the majority of Queenslanders pay the same price for electricity no matter where they live, due to the Queensland government's tariff equalisation policy. Under this policy, Ergon Energy offers tariffs throughout regional Queensland that are similar to those in the south-east. The difference between Ergon's charges and the real cost are paid for by the Queensland government. This is known as the customer service obligation.

RATCH engaged an electricity industry consulting firm to look into this and they identified that if we were to construct a Collinsville solar PV project and the Mount Emerald wind farm, the Queensland government's customer service obligation payments would be reduced by between \$11 million and \$25 million per year. This is due to a reduction in transmission losses. Wind energy is currently the cheapest form of renewable energy. We are confident that it will play a large part in the Australian energy mix when energy is secure, reliable, affordable and forecastable. RATCH is also a developer of coal and gas fired power stations, but we recognise that the future for the Australian electricity industry is renewable.

I wish to quickly address another key point from within the terms of reference regarding the implementation of planning processes in relation to wind farms. Wind farms in Australia already face the toughest guidelines in the world in relation to the siting, operation and permissible noise levels. Wind farm proponents, including RATCH, engage a range of stakeholders. RATCH is absolutely committed to constructive, robust and transparent community engagement. As a power station owner, RATCH is part of the community for 25 years or more. It would not be in our interest to fail to engage properly with the locals throughout planning, construction and the operation phases. Similarly, it would not be in our interests for us to fail to comply with any of the terms of our development consent or applicable laws. RATCH undertakes significant community consultation as part of our development process, including commissioning independent surveys, holding public meetings, producing newsletters and sharing information on our website. RATCH also has a complaints register and a process to deal with complaints we may receive from our operating wind farms and from our future developments. When the Mount Emerald wind farm is constructed RATCH will also commit \$200,000 a year to a community benefit fund to sponsor projects or initiatives that improve the quality of life for local communities.

As a developer of power stations, RATCH is held to account for all the work we produce. Our work is conducted by expert consultants in the field to standards and guidelines that are relevant at the time. One of the challenges we face in our community engagement is that opponents of wind farms projects are not necessarily

held to this high standard, are regularly able to make throwaway comments without any factual basis or justification or critical scientific evidence.

Our consultation consistently shows that a vast majority of local residents support our renewable energy projects. This was clearly identified by the Mount Emerald wind farm survey conducted by Auspoll for RATCH in 2012. RATCH selected Auspoll because the organisation is an industry leader and this survey was carried out in accordance with best practice.

In conclusion, we recognise the importance of scrutiny of all aspects of our electricity generation. RATCH notes that the issues to be reviewed by this inquiry have already been extensively reviewed and considered by at least eight other inquiries in the past five years and each previous inquiry has found that key policies are working effectively, that the wind energy sector is well regulated and that wind energy delivers significant benefits to the regional communities reducing power prices for customers. Many of the issues included in the terms of reference for the committee have already been tested in court cases across the country and have concluded in support of wind energy. The ongoing unnecessary and repetitive review of the wind energy industry are creating uncertainty and causing damage to Australia's reputation as a safe investment environment. Investment in Australia's large-scale renewable energy sector dropped 88 per cent in 2014 compared to the year before entirely due to the uncertainty created by the Australian government. Thank you for the opportunity.

CHAIR: Before we go to questions, does Ergon wish to make a statement?

Mr Edmunds: Would you like us to go through some key items?

CHAIR: We would appreciate it if we could go to questions, if you are happy with that.

Senator LEYONHJELM: I am not sure who is the appropriate person in RATCH to answer these questions. There is reference in some of the evidence we have received in relation to buying out local residents affected by the Mount Emerald development. Where is that up to?

Ms Nangia: I do not understand what you are referring to.

Senator CANAVAN: There was a report in the *Cairns Post* on 20 June last year that when some of the land around the Mount Emerald wind turbine site was purchased there were a number of gag clauses put into the contracts requiring people who had bought land not to make statements about the site. That is the allegation. This is your opportunity to outline what were in those contracts and what is the current status in your view of your implementation of those clauses.

Mr Greenacre: I am happy to answer that question. I think what you are referring to is contracts for the sale of land by our joint venture partner, Port Bajool Pty Ltd. Obviously we cannot speak for them but we understand from our discussions with them is that they included in those contracts representations and warranties which were designed to make potential purchasers aware of the fact that a wind farm was in development in the region of these properties so that the purchasers could enter into any purchase arrangement with open eyes. That was the primary purpose, as I understand, of the terms in those contracts.

Senator CANAVAN: As someone obviously familiar with them, Mr Greenacre, do those clauses prevent people from speaking about the project publicly?

Mr Greenacre: The clauses are designed to ensure that purchasers who buy the land do so on the basis that there could be a wind farm in the vicinity.

Senator CANAVAN: Sorry, you are not really answering my question. Have you seen some examples of contracts?

Mr Greenacre: I have seen examples of some of the contracts.

Senator CANAVAN: So do those clauses put any restrictions on what people can say about the Mount Emerald wind turbine project in public forums?

Mr Greenacre: As I understand, and I am happy to provide further evidence of this if necessary, they do impose some restrictions on public comment in relation to the wind farm but I understand again from discussions with Port Bajool that the reason for that is that the seller of the land wanted to ensure that purchasers of the land recognised that a wind farm being in the vicinity of these properties was essentially part of the commercial bargain and they wanted that to be reflected in the contracts.

Senator CANAVAN: I suppose there are two different things there for me. One is yes, you want to make people aware of a future development and it is a credit to you that people were made aware, but I do not see the link to why then you need to stop people from speaking about it publicly. There is one element of being aware and knowledgeable about a project but where is there a need to restrict people's freedom of speech on this matter? What was the benefit to you as the proponent from these clauses?

Mr Greenacre: Just to clarify, it was not RATCH who sold the land to include these terms in the contracts. As I understand, the contracts were designed to ensure that purchasers of the land understand what is happening potentially in the vicinity. I do not think there was any intention in the drafting of the contracts to restrict anyone from exercising their democratic right to speak publicly. I understand the intention was to ensure that what was in the contracts reflected the commercial bargain.

Senator CANAVAN: Noting that this is a contract between other parties but that you are obviously a joint venture party with Port Bajool and presumably have some influence in that relationship, from your perspective do you see any problems with those clauses being waived and allowing people to speak publicly about the project? In fairness, that question is probably for Mr Nangia as general counsel. It is a question to its merits.

Ms Nangia: That is a question for the joint venture owner, Port Bajool.

Senator CANAVAN: But what is your part in that joint venture?

Ms Nangia: The whole reason for that clause is that there is no objection to the wind farm. If you were going to live next to a wind farm why would you buy some land if you were going to object to it? It is obviously to make it clear to someone, if they are going to buy land near a potential wind farm development, that they are fully aware of it, that they do all their due diligence, that they make sure they are happy with the block and happy with the development. To buy it and then object to the wind farm later seems counter—

Senator CANAVAN: You have probably looked at the guidelines and at environmental management plans, all these things, a lot more than I have but I must say it is not simply that I support a wind farm or I am against a wind farm. There are incredibly complex details around noise management, traffic management, environmental management and all of these other elements. To say that I am for a project or against a project is not a binary choice. The concern I have with clauses like this in contracts is that they prevent people from bringing legitimate concerns about noise, about traffic and about impact on the environment of a project, without necessarily being opposed per se, but it restricts their ability to be involved in the consultation process. How do people voice such legitimate concerns in the face of such contractual clauses?

Mr Nangia: I would not go to the media; I would go straight to the proponents.

Senator CANAVAN: Why shouldn't they be allowed to go to the media? What is the problem with people going to the media? What are you concerned about?

Mr Nangia: If they have legitimate concerns, they can come and talk to us. We are happy to listen to them. We are happy to do what is required to answer those legitimate concerns.

Senator CANAVAN: Why are you concerned about them going to the media?

Mr Nangia: I think they would get a better outcome if they came and talked to us about their concerns so that we could do what is required to alleviate their concerns.

Senator BACK: It would assist the committee if you could perhaps provide on notice a copy of a model contract so that we could understand what the clauses are, then we would have an understanding as to whether they are or are not restrictive. Is that possible?

Mr Greenacre: We are not in a position to commit them to that, but we are certainly happy to raise that with them and, if they are comfortable with the approach, to provide those contracts to you.

Senator DAY: Has there been any legal action by you or on behalf of any of your clients or neighbours in relation to the establishment of the wind farms—threats, letters? Can you enlighten us on your clients in that regard?

Mr Greenacre: Senator, are you referring to the Mount Emerald wind farm?

Senator DAY: Either of the ones that you are aware of.

Senator CANAVAN: Or Windy Hill.

Senator DAY: Yes, or Windy Hill.

Mr Greenacre: We did have a noise complaint in relation to the Windy Hill wind farm, which I understand commenced in 2011. As soon as that complaint was brought to attention—it came from someone who owned a property neighbouring the wind farm—we contacted that person to find out what the problem was and to find out what we could do to try to address it. The complaint was also brought to our attention by the Tablelands Regional Council in I believe September 2011. Once those complaints were brought to our attention, what ensued was a process where we sought to conduct noise monitoring on the relevant property to find out if we were operating in a way which was interfering with the property owner's enjoyment of the property or if we were in breach of our development consent. That process became quite a prolonged process for a range of reasons. During the process

of us conducting that noise monitoring, Tablelands Regional Council did seek to bring legal action against us. We challenged the basis of that legal action. In short, the basis upon which we challenged it was that the notice under which the council claimed that we had breached our development consent did not actually say what the breaches were, so it was quite difficult for us to work out how to address the problem. The council did seek orders in relation to the wind farm, but those orders were not granted by a court.

What ensued after that was that we continued our discussions with the council and with the relevant landowner. We were then able to complete the noise monitoring on the landowner's property. At the end of that, the results of the noise monitoring were presented to Tablelands Regional Council and they then found that the operation of the wind farm had not been in breach of its development consent.

Senator DAY: Has any compensation being paid?

Senator CANAVAN: Sorry, can you repeat that last bit? You said that Tablelands Regional Council concluded that you had not been in breach?

Mr Greenacre: That is right.

Senator DAY: Of the noise, yes.

Senator CANAVAN: In their submission to us, they say that the compliance action took over two years and that delays arose from the operator's initial noncompliance. Do you admit that you were noncompliant?

Mr Greenacre: No, we do not.

Senator CANAVAN: So you disagree. The Tablelands Regional Council in their submission to us says that you were noncompliant. We will have some of them here later. Their submission to our committee says that you were noncompliant, at least initially. You are disagreeing with their view; you feel you were correct?

Mr Greenacre: That is correct—we do not agree with that view. I think I can understand the basis of their claim. Obviously they will speak to this later, as you mentioned. But, early in the process of discussing this noise complaint with them, they said that they did not have evidence of us having complied with our development consent. Legally, that is quite a difficult claim to answer, as you can probably imagine. The difficulty for us is that the development consent for the Windy Hill Wind Farm does require that we conduct noise monitoring and also, of course, that we operate the wind farm in accordance with noise parameters, but the consent does not actually specify or prescribe when that noise monitoring needs to occur.

Senator CANAVAN: My understanding is that the word 'periodic' was used. Is that correct?

Mr Greenacre: That is right.

Senator CANAVAN: So you had to do periodic noise monitoring.

Mr Greenacre: That is right.

Senator CANAVAN: So how much noise monitoring have you done since it was commissioned in 2000?

Mr Greenacre: Since it was commissioned in 2000, there was noise monitoring conducted, I believe, in 2001. This is where we differ from the council's view. Then it was conducted again in 2011 and then, I believe, in 2012 and 2013.

Senator CANAVAN: Two separate times in 2012-13 or just one time? My understanding is that it is three months at a time.

Mr Greenacre: That is right. You could probably say there were three different sets of monitoring—

Senator CANAVAN: In 15 years?

Mr Greenacre: That is right.

Senator CANAVAN: Does that meet your definition of 'periodic'?

Mr Greenacre: What I would say in answer to that question is that since RATCH purchased the wind farm, which occurred in 2011, we have conducted periodic monitoring of the noise generated by the wind farm.

Senator CANAVAN: You bought it in—

Mr Greenacre: July 2011.

Senator CANAVAN: So you have done one since then?

Mr Greenacre: We have done two. One in response to—

Senator CANAVAN: Before the sale or after the sale?

Mr Greenacre: After the sale. One in response to that specific noise complaint.

Senator CANAVAN: When is the next noise monitoring period due to take place?

Mr Greenacre: To come back to Senator Day's earlier question, the experience that we had in relation to the noise complaint was quite useful because that opened up an additional line of dialogue—

Senator CANAVAN: Could you answer the question I just asked? Sorry to interrupt you, but we have limited time. When is the next periodic monitoring due to take place?

Mr Greenacre: We are at the moment concluding the monitoring that we conducted in 2013 and 2014. We had a draft monitoring report which we are finalising and then analysing.

Senator CANAVAN: But you do not have a plan as such? You do not say, 'We're going to do it every three years,' or every two years or every four years? There is no plan like that?

Mr Johannesen: In conjunction with discussions we have had with Tablelands Regional Council, we have agreed to do that every three years.

Senator CANAVAN: So the next one is due next year?

Mr Johannesen: It would be coming up, yes.

Senator DAY: Have you paid any compensation out to any residents as a result of complaints or actions?

Mr Greenacre: Not to my knowledge.

Senator MARSHALL: In relation to the land that was subject to the earlier conversation—the land that was sold by your joint venture partners that was abutting the wind farm—was that sold for a price that was cheaper than it otherwise would have been? Is that the market assessment—that, because there was going to be a wind farm, the land was cheaper than it otherwise would have been?

Mr Greenacre: I do not think we are privy to that information. We are happy to try to obtain it and provide it to you if it would be useful, but, as far as I am aware, we are not—

Senator MARSHALL: If people thought they were getting a bargain, knowing that there was a wind farm there and then willingly signed the contracts that went along with that, personally I do not see anything wrong with that. I just wondered whether people knew it was cheaper. My understanding is that regular surveys consistently show that a large majority of Australians support renewable energy, including wind. Are you aware if there is anything specifically done in North Queensland? Are you aware of whether there are the same views in North Queensland as in the rest of the country?

Mr Johannesen: As Mr Nangia mentioned earlier, as part of the development of the Mount Emerald project, we commissioned Auspoll to undertake a survey in the very early stages of our development. The results of that survey were very much in line with other locations around the country, in that roughly 70 per cent of the people were supportive of the wind farm project.

Senator MARSHALL: I understand that there will be a community fund set up as a result of the project approval. Can you just explain to me what that will be worth and how it will work?

Mr Johannesen: The size of the fund is roughly around about \$200,000. That is what we have put out in the media to date. Now, the way that would be disseminated is that we would set up a trust and then a group to administer that trust made up of representatives of the community. We were looking at roughly around about six people. Our company would have one of those roles. The other five roles would be made up of people from that community. The intention is that that money would be used for public projects and activities; it would not go to any form of individual.

Senator MARSHALL: All right. Thanks.

Senator CANAVAN: Can I just ask a follow-up there? There has been some media speculation that Ratchaburi—is it?—may sell its 80 per cent stake in RATCH. What surety do people have that those commitments to community funds will transfer to any new owner? What contractual obligations do you have or would you pass through?

Mr Johannesen: At the moment, the community benefit fund has not been set up. But once that has been set up it would be part of the ongoing wind farm itself and would be tied to the operation of that wind farm.

Senator CANAVAN: So, if it is sold before it is set up, the new owner may. It is at their discretion.

Mr Johannesen: At the moment, though, as part of our development approval and a statement of commitments we have made within those, that community benefit fund is included.

Senator CANAVAN: Okay. Thank you.

Mr Greenacre: Can I just add to what Mr Johannesen just said? Obviously we are not in a position to comment on what our shareholders do, but it is on public record that one of our shareholders, Transfield Services,

is intending to sell its 20 per cent of our company. What is important to note, I think, is that even if that does occur it will not change our commitment to the Mount Emerald project or to continuing to operate the Windy Hill project.

Senator CANAVAN: This town is really interested in the legal obligations and what not. So you concur with Mr Johannesen that you have made those commitments in writing to the state government for that fund.

Mr Greenacre: That is right, and that goes with the development consent. Because this is a share sale, it would not affect any legal or contractual obligations that we, as a company, would have, and we will continue to perform those going forward.

Senator MARSHALL: You have already told us that, in terms of the benefit to the Queensland government through tariff equalisation, you would expect a benefit of between \$11 million and \$25 million per year. I know you gave us some information in terms of specific jobs. Have you done any further work on the economic impact to the local community in terms of the overall economic benefit? That might include tourism and any flow-on benefits.

Mr Nangia: Yes. We have got some detailed studies on that.

Mr Johannesen: As part of the development for the project, a full economic assessment report was conducted by local consultants here in Cairns. There is a lot of information in there, and I think probably the best way to answer that question would be to provide that information to you rather than to try and pick it off here.

Mr Nangia: There are multipliers for tourism benefits to the local community, local households and that. Obviously, I cannot remember the multipliers off the top of my head—it is quite a detailed report produced by a reputable engineering firm.

Senator MARSHALL: It would be good if you can provide that to the committee. Some other submitters have claimed that wind farms do not actually reduce carbon emissions because the manufacturing process is carbon intensive. In your view, is that true? How long would it take for a wind farm to repay the carbon costs incurred in the manufacturing process?

Mr Johannesen: In response to that question, we are guided by the information we have received from wind turbine suppliers. We asked them how long it takes to pay back the manufacturing costs, the transport costs, the installation costs and all the fuel that is burnt incorporated in that. A number of those companies that provide the turbines to us have undertaken studies in that regard. Generally, they look at it being around about a 12- to 18-month period for all of that carbon intensive manufacturing cost to be paid back. That is what they tend to refer as the 'payback period', and it is 12 to 18 months.

Senator MARSHALL: And generally the life span of a wind turbine is 20 years, I think, from submissions?

Mr Johannesen: Twenty to 25 years.

Senator MARSHALL: I am also interested in your view on some of the submissions that have asserted that wind power displaces coal energy output—so the coal generators essentially run and burn fuel without generating electricity. How is that viably managed within the grid system and are those assertions accurate?

Mr Hallenstein: I think what you are talking about is spinning reserve, which seems to come up sometimes in relation to wind farms and wind turbines. Ergon could also talk about it. In the power system, it is also called 'contingency' and it refers to the service of adjusting electricity supply in the event of a sudden, unexpected change in supply or demand. So, in simple terms, if a power station suddenly has a fault and stops working then other generation needs to quickly come on line to replace it. The response for such a situation needs to be very fast in order to maintain the stability of the power system and to keep everyone's lights on. If we had a backup power station sitting there switched off and it had to be started from that state, being switched off, then it would take minutes to start up before it started feeding electricity into the grid—maybe even up to hours, in the case of some coal fired power stations, and that would be too slow to respond. For that reason, there are some power plants kept idling so that they can ramp up quickly if there is a sudden need for more power due to a contingency event.

In terms of the size of the reserve that needs to be sitting there waiting as backup, our national electricity market, called the NEM, considers that a credible contingency event is the unexpected loss suddenly of one power station on the network. So the spinning reserve backup needs to be large enough to cover the loss of electricity generation in case any one of the currently operated power stations suddenly shuts down.

I am simplifying a little here because the details get very technical, but the critical case here is if the largest of the currently operating power stations suddenly shuts down, so the spinning reserve is sized to cover this one, the largest one. If it is going to cover the loss of the largest power station then it would cover the loss of any of the

others if they were to fail as well. Up to this date in the NEM, the largest power station has been a coal fired power station. Wind farms can be quite big, they can comprise many turbines, but overall the size of a wind farm is generally a fair bit smaller than the size of one coal fired power station. So the spinning reserve is sized to cover the loss of one coal fired power station.

So there is no extra requirement for spinning reserve due to wind turbines. If a wind turbine was to fail, if a whole wind farm were to fail, if the wind suddenly stopped blowing, which is something that does not actually happen—the wind is very predictable and forecastable, and it does not just stop blowing—but let's say for some reason a wind farm suddenly shuts down, whatever backup is there would be there, whether or not that wind farm was operating, because there is always a larger power station which it needs to be there for as well.

Senator MARSHALL: That is managed by whom?

Mr Hallenstein: That is managed by AEMO, the Australian Energy Market Operator, the operators of the electricity market in Australia. They dispatch the power stations. They tell them when to turn on and off. They monitor the supply and demand, and balance it. They respond to contingency events and so forth.

Senator MARSHALL: North Queensland is on the national grid?

Mr Hallenstein: That is right.

Senator MARSHALL: These decisions are made by regulator or is it a cooperative thing between all electricity—

Mr Hallenstein: It is governed by a set of rules which comes through regulation. This network is the called the National Electricity Market, which covers all of eastern Australia—it does not include Western Australia. They have their own grid, which is separate. So, yes, it comes through regulation.

Senator BACK: Western Australia do not seem to be part of the national grid.

Senator MARSHALL: For very good reason.

CHAIR: Would you be able to enlighten the committee as to what specific information the federal environment department is still seeking from you? I believe they are meeting with you again this week—is that correct?

Mr Finney: Not to my knowledge. We have had various discussions with them of late about additional information and we believe we have given them all the information that we have got. There is always more information that you can study on these sorts of things, but we have given them a comprehensive amount of information.

Senator CANAVAN: Can we drill down on the threatened species, the native fauna and flora. What are the matters of national environmental significance that will possibly be triggered?

Mr Finney: There is the northern quoll, a crane called the sarus crane, a microbat and the spectacled flying fox.

Senator CANAVAN: Are those last three all endangered? What will the impact be on those? Presumably the quoll will not run into turbines, but will the other three potentially fly into turbines? Is that the risk?

Mr Finney: That is the risk, yes.

Senator CANAVAN: And have you done any impact analysis yourselves on how many of those species would potentially be killed every year?

Mr Finney: We have done a lot of field studies, which are then converted into computer models to try and work through the potential for that to happen. We call that a utilisation study, and then that goes into a collision risk model.

Senator CANAVAN: But do you have the numbers of microbats, cranes? The other one was the—

Mr Finney: For the crane, it depends on what sort of avoidance rate you put into the model. There has been some work done in Australia on this. There needs to be more, but we did a sensitivity analysis and looked at various percentages—

Senator CANAVAN: What sort of range are we looking at in terms of numbers impacted?

Mr Finney: For the sarus crane it was between 0.14 and 0.8 animals per year. Southern Wind Farms have studied a number of other birds—raptors and various eagles—and the models always tend to overpredict. There has been mortality—

Senator CANAVAN: Have you got numbers for the other ones—the flying fox et cetera?

Mr Finney: No, we do not.

Senator CANAVAN: Can you take the flying fox numbers on notice? And what was the other one—the microbat?

Mr Finney: The microbat, yes.

Senator CANAVAN: Could you take that on notice—the sensitivity range and how many would be impacted per year?

Mr Finney: Yes.

Senator CANAVAN: What about the quoll? What is the impact on the quoll?

Mr Finney: The quoll could be impacted by construction. The animals put their young in dens underground at certain times of year. That is the time, if you are doing earthworks in that area, that you could potentially disrupt the breeding or even kill the animals. But we have studied them comprehensively. There is a little bit more work to be done, but we have a fairly good understanding of the breeding time when they do this, when the animals are underground, and we have some contingency measures and adaptive management plans in place to minimise that impact.

Senator BACK: Mr Johannesen, thanks for the response to Senator Marshall's question regarding the length of time before you get back to carbon neutrality. I wonder if you would be kind enough to give us the information that you said the manufacturers provided you with. I would ask you to also go back and have a look at the *Hansard* from our hearing in Portland, where a similar question was asked. The answer that was given was that, if a wind turbine operated eight hours a day, which it would not, it would actually take 20 years before it would get back to carbon neutrality, given the original iron ore, the steel, the fabrication, the transport, the concrete et cetera. Your information of 18 months I find to be very interesting, in contrast to the 20 years. So I wonder if you could provide us with the evidence where you got that from.

Mr Johannesen: Obviously I will look at the *Hansard*, but do you know who provided that information?

Senator BACK: Yes. Mr Cumming was his name. His assertion to the committee was that he went back and used the figures provided by the manufacturers and those who established and developed the projects. Secondly, I wondered if you could tell us—

Mr Hallenstein: Sorry to interrupt you. Do you mind if I just make a comment related to that?

Senator BACK: Go ahead.

Mr Hallenstein: As Mr Nangia said earlier, RATCH is a developer of all kinds of power stations. We own a coal plant, we own three gas plants, we own some wind farms and we have some solar PV developments, although we do not own any of that yet. We have never been asked this sort of question about any of our fossil fuel plants.

Senator BACK: That is fine. At the moment—

Mr Hallenstein: I question why the senators and others continue to talk about that.

Senator CANAVAN: I will help you out. We are providing something like \$300,000 to \$400,000 a year per turbine in subsidies to wind energy, and the rationale—

Mr Hallenstein: Who is providing the subsidy?

Senator CANAVAN: Hang on. The rationale for that is primarily to reduce carbon emissions. We do not provide similar subsidies to coal fired power plants or gas fired power plants—certainly not for that reason, because they are clearly not carbon neutral. So it is an extremely relevant question in the context of the amount of money that the federal government is providing, and we are federal senators. That will, of course, be something we look into in this inquiry.

Senator BACK: Also, given that comment, you may be kind enough, perhaps in a different forum of questions, to provide us with some of the coal feed data. That would be very, very useful to the committee in understanding that. I will just go back if I can, Mr Johannesen, before I get to my substantial questions. You mentioned 70 per cent community support and we have received evidence of 90 per cent community opposition. I guess the question I am asking is: can you provide us with—

Members of the audience interjecting—

Senator BACK: What I am interested in knowing is: what is the 70 per cent community? It might be the community of Cairns. It might be the community of Cooktown or somewhere. I am interested in knowing the community likely to be affected by the industrial wind turbines. Again, without taking the committee's time, if you could provide us with a scan of who that community was that was 70 per cent in favour, I would be most appreciative.

Mr Johannesen: Probably the best way to do that is to provide you with the full polling detail.

Senator BACK: That would be good—and not just postcodes. I am interested in knowing the distances of the people likely to be affected.

Mr Johannesen: The polling itself did break down the number of people who responded into the distances away from the site.

Senator BACK: Excellent. Thank you. That would be tremendous. Mr Nangia, regarding the High Road wind farm, I want to explore a few issues associated with noise. That is a wind farm that either has operated or is to be operated by your company?

Mr Nangia: High Road was in development. It has since stalled or stopped, basically. It was put on hold because of the uncertainty.

Senator BACK: I understand a development permit has been issued to approve the construction of that.

Mr Nangia: Yes.

Senator BACK: Did you say it has been put on hold?

Mr Nangia: Yes.

Senator BACK: Without breaking confidentiality of your commercial interests, is it possible to tell the committee why that has been put on hold?

Mr Johannesen: At present it is on hold because there is no power purchase agreement available to make that project worthwhile.

Senator BACK: Am I right in my understanding that that project does comply with the Queensland government noise policy of a 30-decibel limit?

Mr Johannesen: That is a 30-decibel limit indoors.

Senator BACK: Indoors at night.

Mr Johannesen: That is what it was designed to do, yes.

Senator BACK: And the design would meet those criteria?

Mr Johannesen: That was the intention, yes.

Senator BACK: That 30-decibel indoor limit at night averaged over an hour, as I understand, is Queensland government policy but consistent with World Health Organization requirements of 30 decibels indoors?

Mr Johannesen: I believe so, yes.

Senator BACK: Excellent. Can you tell me whether the proposed Mount Emerald wind farm also complies with the 30 decibels indoors, as was the case with High Road wind farm proposal?

Mr Johannesen: That was the intent, yes.

Senator BACK: And is that what it will achieve?

Mr Johannesen: The modelling shows that it will, yes.

Senator BACK: So the committee can be assured that that 30-decibel limit indoors, which I think is equivalent to 35 decibels outdoors—is that right?

Mr Johannesen: The concept of how much of the noise energy is lost from outdoors to indoors is a little bit more difficult to understand, but a five-decibel reduction would be the bare minimum.

Senator BACK: So, if this proceeds, the project will be able to comply with that 35-decibel limit outdoors, translated to 30 decibels indoors?

Mr Johannesen: It will achieve that, yes.

Senator BACK: Excellent.

Mr Johannesen: The planning permit conditions for the Mount Emerald wind farm have given a maximum noise of 35 decibels at night-time, so we would have to comply with that.

Senator BACK: You would have to comply with that. Does your acoustics assessment at the moment tell you that that is going to be able to be achieved?

Mr Johannesen: We will have to achieve that. That would be the permit condition.

Senator BACK: That will be averaged over—what, a 30-minute period?

Mr Johannesen: A 10-minute period.

Senator BACK: Averaged at each 10-minute period?

Mr Johannesen: A 10-minute period, yes.

Senator BACK: We are not talking about an average over the night and you get down to 30 by having 60 or 55 for half the night, going down to 15 or 20 averaged out. You are talking about 10-minute intervals.

Mr Johannesen: Yes. That is what the compliance noise modelling asks for.

Senator BACK: That is very good—thank you. I will go for a moment to the Windy Hill wind farm, which I understand is operating at the moment.

Mr Johannesen: Correct.

Senator BACK: You may or may not be aware from Portland that, perhaps for the first time, we had the benefit of cooperation between the operator of the Cape Bridgewater wind farm, being Pacific Hydro, as well as six people in three dwellings who claim to have been affected or are being affected by adverse health effects and an acoustician. Operating in agreement between them, Pacific Hydro, the acoustician—who I believe is Mr Cooper—and the six persons in the three residences all participated in what was a very preliminary study. The preliminary study looked at the impact of what were regarded as sensations but were not in the audible sound range. The sensations might have been headaches, nausea, sleeplessness or tinnitus. The people were able to detect these changes in sensations or vibrations when the wind turbines were turned on or off or up or down by 20 per cent or more. This was very preliminary work. Nobody is suggesting that it was scientifically valid. Nobody is suggesting that it was anything other than an indication of six people in three dwellings.

It seems to me to be very important that this work now be replicated to see, in different environments and perhaps over a larger population, whether or not this infrasound rather than audible sound is indeed an issue. Is it possible that you as operators of the Windy Hill wind farm and indeed other wind farms in Victoria would be agreeable to participate in a similar study to establish whether indeed it is infrasound rather than audible sound that seems to be having any adverse impact on people in the vicinity of wind turbines?

Mr Pattison: As background information, one of the things we are now looking at for the Mount Emerald project is assessing noise levels not just in the audible range but also in that subaudible range—infrasound or low frequency.

Senator BACK: I mean low-frequency infrasound.

Mr Pattison: From what I have seen from the noise consultants, apparently they are two separate things.

Senator BACK: They are.

Mr Pattison: One of the conditions we did receive for the Mount Emerald wind farm was that we now have low-frequency noise limit that we also need to comply to.

Senator CANAVAN: Is that in the dB(C) range?

Mr Pattison: Yes, in dB(C).

Senator CANAVAN: But is that inaudible or is that just low frequency?

Mr Pattison: It is low frequency. Depending on the volume, it can become audible. So in low-frequency noise they use the term dB(C). For infrasound, they use the term dB(G). There are limits set out by the World Health Organization for both those ranges. Any of the new wind farms that we are developing, we heed that and meet those requirements.

So as far as the question around whether we would be prepared to participate in a study such as the one that Pacific Hydro did with Steven Cooper, obviously that is going to be a company decision and possibly would not be one that I could make here.

Senator BACK: I ask that your senior management take that question on notice because I think it is in everybody's interests to actually come to an understanding. The reason for the importance of this to me is that in most instances the Australian and New Zealand standards, the South Australian standards et cetera, the approvals are actually given in the audible sound range. If indeed the audible sound range is irrelevant to the actual health effects of people then it calls into question the validity of the approvals of these projects around Australia. I think it is in everybody's interest to actually get on top of this and see if this indicative figure from a very small population of six people, but directed by Pacific Hydro, is in fact valid or is not. The only way we are going to establish that is to expand it beyond one location at one time and see it more widely. That is my appeal to you.

Senator MARSHALL: Earlier Mr Hallenstein indicated that he might have had some further information about the carbon emissions of the manufacturing process of other forms of power generation. If that is available, I think that would be useful for the committee. I know you also had a view, which you were jumped on for by

Senator Canavan, that you were then not able to express. We may not get the opportunity for you to express that today but, if you want to express that view that you were going to express in writing, I think that would be useful for the committee too.

Mr Hallenstein: I do not actually have particular numbers about other forms of generation. I would point out that other forms of generation are never carbon neutral. If you are always shovelling coal into a coal plant, you continue to generate carbon emissions.

Senator BACK: Chair, my only point there was the difference between 18 months and 20 years. We have actually got to come to a better understanding of what that differential is.

Mr Nangia: We need to understand where the figures—

Senator BACK: Exactly right. That is why the committee is keen to do so.

CHAIR: Senator Leyonhjelm.

Senator LEYONHJELM: Thank you, Chair. It is hard to get the call back again.

Senator BACK: You should not have given it up.

Senator LEYONHJELM: What is the paid-up capital of RATCH?

Mr Nangia: The paid-up capital of RATCH in Thailand?

Senator LEYONHJELM: No, RATCH-Australia.

Mr Nangia: It is a private company.

Mr Greenacre: Senator, it is a private company. I believe some of the submissions claim that RATCH is a \$2 company. That might be where your question is coming from. I can say that we are not a \$2 company. As was mentioned earlier, we have two large shareholders, both of which have significant market presences and their intention is to continue to fund the company and its operations going forward.

Senator LEYONHJELM: Good. So what is its shareholders' funds then—its net asset value?

Mr Greenacre: I would have to take that on notice and come back to you. I do not think that is public information.

Senator LEYONHJELM: The point of course is in the event of a substantial damages claim it would be an issue as to whether or not the company could afford it. That is the purpose of it. So, if you could take that on notice, that would be good.

Mr Greenacre: Just to clarify: are you referring there to a damages claim arising from the operation of a wind farm?

Senator LEYONHJELM: Yes.

Mr Greenacre: And a problem with the wind farm or are you talking about sound effects or health effects?

Senator LEYONHJELM: Any source of damages if there was a damages claim. The allegation is made sometimes against coalmining companies, for example, and they do not have the financial resources to remediate the onsite losses that occur. In fact, there is a bond process in New South Wales in an attempt to address that. So I guess it is relevant to a power company whether the power is produced by wind or by coal. That is the purpose of my question and you can take it on notice.

Senator CANAVAN: Senator Leyonhjelm, sorry to interrupt again. Can I just get you to take on notice also whether Mount Emerald Wind Farm Pty Ltd has a substantial net asset value of paid up capital? I suppose while you are here: is Mount Emerald Wind Farm Pty Ltd a \$2 company?

Mr Greenacre: No, it is not. I am happy to provide more detailed information.

Senator LEYONHJELM: Senator Canavan, you just have to be patient here.

Senator CANAVAN: I am just trying to help.

Mr Greenacre: Sorry, Senator. I want to add to my answer on that question. Obviously when we enter into these projects we are entering into 25-plus-year projects. It is certainly not our intention and it would not be in our interests either to under-resource any of the corporate vehicles we use for those projects to the extent that we were not able to discharge our legal obligations. We have insurances, equity funding, project financing and all of the financial arrangements in place that you would expect to see a company have that does risky projects. We are certainly happy to provide more detailed information on that.

Senator LEYONHJELM: Thank you. There is reference in one of the submissions to the number of people within five kilometres of the proposed Mount Emerald wind farm. Do you have any figures on that of your own?

Mr Johannesen: Out to five kilometres?

Senator LEYONHJELM: Yes.

Mr Johannesen: I believe in the EIS submission and in the DA submission there is a breakdown of how many people we have estimated out to one kilometre, two kilometres and three kilometres. Those numbers are all in there. I cannot give you those numbers off the top of my head right now but I believe they are in the publicly available information that has been made with either the EIS or the DA.

Senator LEYONHJELM: Is there a prison farm within five kilometres of the site?

Mr Johannesen: The Lotus Glen prison facility is located roughly between four and five kilometres away, yes.

Senator LEYONHJELM: And there are 1,000 prison staff and 900 prisoners; would that be accurate?

Mr Johannesen: I do not think that would be accurate that there would be more staff than prisoners.

Senator LEYONHJELM: Okay, but there is a prison farm within four to five kilometres?

Mr Johannesen: There is, yes.

Senator LEYONHJELM: Let me just verify that I have accurate information here about RATCH-Australia's operations. The Windy Hill farm is 20 turbines of 0.6 megawatts built in 2000; is that right?

Mr Johannesen: Correct.

Senator LEYONHJELM: Toora is 12 turbines at 1.75 megawatts?

Mr Johannesen: Yes.

Senator LEYONHJELM: Starfish is 22 turbines at 1.5 megawatts built in 2003?

Mr Johannesen: Yes, that sounds correct.

Senator LEYONHJELM: The majority of complaints about noise from wind farms is centered around very large wind farms of over 100 turbines, double the height and capacity of the turbines you are proposing at Mount Emerald, and most have started operating in the last two to four years. There is a study by Professors Moller and Pedersen which found that larger, modern turbines emit lower-frequency noise and broadcast it over a much broader area than the smaller, older turbines—are you aware of that?

Mr Johannesen: Vaguely, yes.

Senator LEYONHJELM: The point is that although you have had some complaints about your existing wind farms, if Professors Moller's and Pedersen's report is accurate, it would suggest that you are likely to receive substantially more complaints as a consequence of noise from the fact that your turbines in Mount Emerald will be bigger with higher capacity—they are going to be three megawatts is that correct?

Mr Johannesen: That is correct.

Senator LEYONHJELM: Have you considered that?

Mr Johannesen: Yes. In reference to the older, smaller wind farms, generally what you see there is the distance between the turbines themselves and any of the residences is significantly smaller than the distance that are allowed for the modern-day larger turbines. The key driver to setting that distance tends to be the noise modelling. The noise modelling that you do for your project sets how far away the distance is to those houses. As we mentioned previously to Senator Back, there are certain limits that we must stay below and that tends to dictate what that distance needs to be.

Senator BACK: Are you familiar with any data related to synchrony between the turbine actions versus asynchrony?

Mr Johannesen: I have seen a number of studies that mention that if you do have synchrony then that would make the instances a lot worse. However, someone went through and did a further follow-up report that looked at how likely any form of synchrony would be and the probability of that occurring on any great number is very small.

Senator LEYONHJELM: You said in your submission that you rely on local, state and federal public health authorities to explain the prevailing scientifically valid view that the 'total available evidence suggests no risk of adverse health impacts from wind farms'. We have heard substantial evidence to the contrary on that obviously. I also note that you rely on NHMRC, but the NHMRC CEO, Professor Warwick Anderson, was being asked about this at Senate estimates and he said, 'We do not say there are no ill effects'. Are you aware of that?

Mr Johannesen: No.

Senator LEYONHJELM: The broad question for RATCH is this: if you comply with the state planning guidelines and you allow your wind farm to be monitored so that you do not breach them at any point, whether intermittently or not, do you consider that there is no likelihood of any liability for anybody who is able to establish a negative health impact as a consequence of the farm's operation?

Mr Johannesen: That would tend to be a legal question.

Mr Greenacre: I think that is a hypothetical that we would need to consider at the time if that issue did arise.

Senator LEYONHJELM: As a lawyer I assume you are aware of liability and tort—do think there is any prospect of liability and tort independently of the statutory obligations regarding noise?

Mr Greenacre: Of course there is always that possibility. Tort law operates alongside regulation and contract law so that is obviously not a possibility that we would discount and that is something that we consider in developing these projects.

Senator LEYONHJELM: The chair is giving me the wind-up, but I just want to ask Ergon a couple of questions. I am not entirely sure I understood the point you were making in relation to exclusion zones regarding the possibility of establishing wind turbines on remote islands. There was quite a rational argument there as to why turbines might be more useful. You made a point, which I did not quite get, which was: 'constraints such as blanket exclusion zones for wind turbines'. Could you explain that for me, please.

Mr Edmunds: I will pass to Sophie to answer that question.

Ms Allen: In relation to that point, it is really to highlight that, in very small communities, in remote communities, particularly island communities, where there are small populations, individual power needs and energy needs for that community are designed for that specific community. Therefore, any planning and approval processes would be best tailored to the individual community rather than having blanket rules and regulations.

Senator LEYONHJELM: You are mainly worried about the separation distance?

Ms Allen: In relation to that statement that you read, that was our consideration there.

Senator LEYONHJELM: In other words, you say it would not be practical on some of the islands to put a turbine more than 1½ kilometres away from residents? That is what applies in the Mount Emerald guidelines.

Ms Allen: Absolutely. We have two turbines on Thursday Island. Thursday Island is three kilometres long by 1½ kilometres wide. The two turbines were installed in 1997. They are still in operation and have been in operation since then. They were the first utility-size turbines to be installed in Australia. They provide five per cent of the energy needs of the community of Thursday Island. If there were, for example, 1.5 kilometre exclusion zones, then for the Torres Strait, where we have 16 power stations, that would mean we would be locking into diesel for the long term, rather than looking at alternative ways.

Senator LEYONHJELM: What is the generating capacity of those turbines on those islands?

Ms Allen: There are two 225 kilowatt turbines; 450 kilowatts in total. It is very small scale. The loads in these islands are very small—small populations, small loads. We are talking about hundreds of kilowatts, generally speaking.

Senator LEYONHJELM: You make a valid point there. I think it is probably off our terms of reference a bit though. You are saying there should not be a blanket rule for the separation distance for all turbines. The evidence we have received is that the bigger the turbine the more adverse are the potential health effects. For the ones that are going to be built at Mount Emerald, for example, the evidence we have received would suggest that they are far more likely to have adverse health effects from infrasound, low-frequency sound, than the little ones that you are talking about on the islands. Do you have any view on that?

Ms Allen: I cannot comment on that.

Mr Hallenstein: Might I table some evidence in relation to the health effects of wind turbines related to what you were talking about?

Senator LEYONHJELM: By all means.

Mr Hallenstein: I just provided you with a report published in 2012 in Crikey magazine. It is called 'First Dog on the Moon'. It goes through the 765 different symptoms of wind turbine syndrome—everything from crickets disappearing, to chicken eggs being all weird, to balance disturbance, falling off horses. I printed out black-and-white copies. I thought maybe you could get some pencils from reception and colour them in a bit later on, and at the end of the day we can vote on whose looks the best.

Senator BACK: Mr Nangia, that was not a wise tabling for that young gentleman to make.

CHAIR: The committee will decide, Mr Hallenstein, what is accepted or not accepted. You have tabled the report.

Senator CANAVAN: A cartoon!

CHAIR: We will decide whether or not it is accepted.

Senator CANAVAN: He has tabled the cartoon, and I am happy to accept the cartoon.

CHAIR: We are running over time. Senator Day, do you have a last question?

Senator DAY: Mr Greenacre, you said earlier that no compensation had been paid to people. Is it the case that in relation to the Toora Victorian wind farm a number of properties were bought, people were compensated and dwellings bulldozed before sound measurements could be taken? Are you aware of that?

Mr Greenacre: I myself am not aware of that. One of my colleagues might be. If not, we are happy to take the question on notice.

Mr Johannesen: I think what you are talking about there are dealings with the previous owner of the Toora wind farm, Stanwell Corporation. I do believe that there were a number of properties that were purchased. That was at the request of the owners, who went to the company. As far as the details or anything further, I would not be able to give you anything on that.

Senator CANAVAN: I want to go back to the economics. Mr Nangia, you spoke earlier about the local community impact. Mr Johannesen, you mentioned three megawatt capacity turbines?

Mr Johannesen: Around that.

Senator CANAVAN: What is the capacity factor of those?

Mr Johannesen: It is 30 to 35 per cent.

Senator CANAVAN: Do you model a REC price of some kind at the moment? Let us say 35 per cent and be really conservative. I make it that each of your turbines will get \$321,000 a year in REC sales from the government. You have 63 turbines in this project?

Mr Johannesen: That was what was approved.

Senator CANAVAN: So \$20.2 million a year from the federal government. Is it 25 years?

Mr Johannesen: Yes.

Senator CANAVAN: So it works out at \$507 million from the federal government. You said, I think, \$380 million costs or so. You are getting more than a 100 per cent subsidy from the federal government. How is that a good deal for Australia? Mr Nangia, small businesses in last week's budget only get 100 per cent deduction for \$20,000. You are getting more than that for \$500 million. How is that a good deal?

Mr Nangia: We are also spending in the local community. We are spending over \$70 million or \$90 million in the local community to build the infrastructure.

Senator CANAVAN: At a cost of \$500 million increased power prices.

Mr Nangia: It will go to any renewable energy project. It is built in Australia. If it does not come to the local community in the tablelands, it will go to South Australia, or it will go—

Senator CANAVAN: I think it is very important for everybody to realise, when you quote numbers about the local community impact, how much it actually costs the entire country, particularly those people who use power, including those people North Queensland.

CHAIR: Could RATCH supply their power purchase agreement to the committee.

Mr Nangia: For the Mount Emerald wind farm?

Senator CANAVAN: I think you said you have a PPA with Windy Hill?

Mr Nangia: We do have a PPA for Windy Hill, but that is close to being terminated. That is a commercial-in-confidence document.

Mr Greenacre: It is expiring in about three months.

CHAIR: Can you supply a power purchase agreement, or not?

Mr Nangia: I can talk to our lawyers. Yes, if there are no issues with the confidentiality. We will take it on notice.

CHAIR: Thank you RATCH-Australia and Ergon Energy for your appearance here today.

CHEMELLO, Mr Gregory John, Deputy Director-General, Planning Group and General Manager, Economic Development Queensland, Department of Infrastructure, Local Government and Planning

[09:45]

CHAIR: I welcome the Queensland Department of Infrastructure, Local Government and Planning. Please confirm that information on parliamentary privilege and protection of witnesses and evidence has been provided to you.

Mr Chemello: Yes.

CHAIR: Thank you. I remind witnesses that the Senate has resolved that an officer of the department of the Commonwealth or of a state shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of the officer to superior officers or to a minister. This resolution prohibits only questions asking for opinions on matters of policy and does not preclude questions asking for explanations of policies or factual questions about when and how policies were adopted. The committee has your submission and I now invite you to make a short opening statement. At the conclusion of your remarks, I will invite members of the committee to put questions to you.

Mr Chemello: I have an opening statement. In the context of time and of our submission, I will skim over some things and miss some things. I do want to talk about some more things other than what was in a written statement so I think it is appropriate for me to make some comments at the start.

The first point I need to make is that I am representing the department in relation to its advice to the Deputy Premier and Minister for Planning in her capacity as the planning minister for the call in for Mount Emerald. I am representing the department's advice to the minister as opposed to—I am not representing the minister herself. That is clear. I can certainly answer questions about the department's advice to the minister. I guess if you are asking me questions later on about what was the minister thinking when da, da, da; I will have a context of a response which will say I convey advice to her in that respect—and to the preceding minister. I am also representing the department in terms of the potential wind farm code. That was a matter of the submission to the committee. That is a code under the department, not a code of the minister. I will explain that in a minute.

Currently, local governments are the assessment managers for wind farms in Queensland, assessing these proposals against their local planning schemes. However, as you probably know, the vast majority of planning schemes do not actually include planning provisions about wind farms to address the complex characteristics specific to wind farms. More importantly for me, many councils where it is consistently windy simply do not have the resources or the capacity to deal with the complexities of wind farm assessment. That is not necessarily a criticism of councils. These tend to be in remote areas and are smaller councils with fewer financial and human resource capabilities. In 2013, the then Queensland government proposed that all wind farm developments would be assessed by SARA, the State Assessment and Referral Agency, which is a unit of my department. That is the single lodgement and assessment point for all development applications in Queensland where the state has a matter of interest. If this were to be the case—and it is not the case yet, there is a draft wind farm code released and a further draft to be released. But if it became the case, the state would then take on the role of regulating the development of all new or expanding wind farms to ensure that any potential adverse impacts on community, environment and airports are avoided or mitigated during the construction and the operation phases.

The department thinks a new state based assessment process of wind farms would ensure a coordinated whole-of-government approach is applied to wind farms, making the process more straightforward, fairer and more consistent. That is consistency for both the developers of wind farms, the operators of wind farms and the communities. It would also establish, we think, clear expectations in regard to what would be the assessment and the construction of the operation of wind farms.

To facilitate and guide this we reproduced a draft wind farm code and associated wind farm code planning guideline. The preparation of the code and the guidelines will be based on expert technical advice; extensive consultation with stakeholders, internal to the department and external; and detailed reviews of national and international best practice including existing state, national and international wind farm guidelines. I do need to emphasise that this policy position of making SARA, within my department, the assessment manager for all wind farms across the state has not yet been formally endorsed or considered by the new Queensland government. The work kicked off by the previous government has not been formally endorsed yet by the new government. There is of course the option of the state retaining the current arrangements, whereby the local governments are still the responsible entity for assessing wind farms; that is still an open possibility. In that case, the draft guideline that we prepared and revised could become a suggested code or guideline that local governments may or may not adopt. I will not go into details about how SARA works but I am happy to answer some questions about that.

We released the initial draft of the code for consultation from April to May last year. More than 100 submissions were received in response to that, and the key concern raised by the submitters to our draft code was the ability of the code, as we had drafted it, to adequately address the complex acoustic issues associated with wind farms. That was the main issue of contention, I think, in response to the draft.

Subject to endorsement by the new Queensland government, which I am hoping is imminent, it is the department's intention to release a substantially revised draft code and guideline for a second round of consultation next month, if I can. Again, all submissions will be received, the detail assessed, the code and the guideline hopefully finalised, and then considered by the government. If that happens, then all future applications in Queensland would be assessed by the state. They would become what we call 'impact assessable' under our planning regulations, which means that there is requirement for public notification of each development application. There is a right of community and interested parties to put submissions in and there is a right for third-party appeals to the Planning and Environment Court. The code and the guideline will be reviewed and updated, of course, as science and technology change.

I might make a couple of quick comments about Mount Emerald, if I may. Now, Mount Emerald wind farm obviously precedes this potentially state-wide assessment code, and that application has been dealt with under the prevailing legislation and arrangements. Under the planning act, the minister for planning may call in a development application if the development involves what we call a state interest, and a state interest is defined in the planning act as either of two things: (1) an interest that the planning minister considers affects an economic or environmental interest of the state, for all or part of the state; and (2) a matter that affects the efficient, effective, accountable land use planning and development assessment system. So it is either a matter that affects the economy or the environment, or a matter that affects the planning system itself.

The former minister for planning determined that the Mount Emerald wind farm development involved some economic and environmental interests of the state. That was in response to the Tablelands Regional Council, who wrote to the former minister on 28 January 2014, requesting the application be called in on the basis that the council did not have the fiscal capacity and the technical expertise to assess the development application. I am reading my notes; I am not too sure whether it is the Tablelands Regional Council or the Mareeba Shire Council. I certainly had discussions with the Mayor of Mareeba Council at the time, when the request was made. I think this postdated the de-amalgamation, so it was probably the Mareeba council. I know the Mareeba council wrote. I cannot confirm whether the Tablelands council wrote as well.

That application from Mount Emerald was what we call 'code assessable' under the planning system in Queensland. That means it did not require public notification, because that was the way it was configured under the then local government planning scheme. I am aware that the applicant themselves held information sessions in March 2011 in Mareeba, attended by a lot of people, but the point there is that the council was not obligated to do public submissions. So council started the whole process, and then, in April 2014, the then planning minister issued a potential call-in notice.

Call-ins work in a two-phase process under the current legislation. The minister is obligated to say, 'I'm thinking about calling in an application,' and to receive submissions about that, consider those submissions and then make a determination about whether to actually call in the application. So representations were sought. We received 24 representations. Nine agreed that it was a state interest; 10 supported the then Deputy Premier calling in the application. None of the submissions we received said there was no state interest or that the application should not be called in. So the application was called in on 11 June 2014. In June, we issued a request for more information to the applicant, they responded in September, and the department undertook an assessment—in September, October, November and December—of the information they provided. There is a formal decision making program—

CHAIR: Mr Chemello, is there any more to your opening statement?

Mr Chemello: I have one last paragraph—it really is that. The decision-making process was extended numerous times by the former and the current planning ministers, and that enabled them the opportunity to consider more information and to meet with the local community. Then the incoming current Deputy Premier decided the application on 24 April this year. Thank you. I invite questions from the committee.

Senator CANAVAN: Thank you, Mr Chemello. I want to pay tribute and credit to you for the development of the wind farm code in Queensland. It has been a long time coming. Having read through it just recently, it does seem to go further, perhaps, than some of the other codes around country. Could you outline for us if you agree with me on that and where you have tried to make some additional conditions compared to SA or NZ guidelines.

Mr Chemello: Yes, I will always agree when people say we are doing a good job! It is a difficult issue. We found, as you have, inconsistencies across the country and how wind farms are dealt with in planning systems. Certainly, the first draft that we released last year was not very good. It did not enable us and the community, I think, to move forward. The key things in this draft have been greater clarity, particularly in regard to noise and distance. There are some parameters in there. I guess the other clear thing in my mind is the guideline that goes with the code. I cannot recall whether you have—the code is quite short. It is—

Senator CANAVAN: I have a bunch of appendices. Is that what you call the guidelines?

Mr Chemello: The guideline, which is quite thick, is 50-odd pages. That really explains the issues of how you measure and how you monitor. I think that is the key advantage of this version over the previous draft.

Senator CANAVAN: Just going to that, I think it is one of those guidelines at appendix 5. You have some guidelines around audible noise and:

The predicted equivalent noise level (LAeq, adj, 10min), including tonality adjustment, does not exceed whichever is the greater of:

1. 35dB(A) at relevant sensitive receptors ...

Could I just ask you to compare that to the condition that is put in the Mount Emerald conditions, which seems to apply a similar standard but only for noise levels averaged overnight, rather than for 10 minutes? Am I misreading that? I am not an acoustics technician.

Mr Chemello: I think you are. I think they are identical.

Senator CANAVAN: So in condition 4 of Mount Emerald, it says, 'The wind farm development must be designed and operated to ensure that the outdoor night-time equivalent noise level at existing sensitive land uses does not the higher of'—and yes, the same as it was in appendix 5—but it says their 'LAeq night'. I take that to be reading as averaged over the night, not over 10-minute intervals. In part A 5.1 it explicitly says 10 minutes. The Mount Emerald code just says night. Are they the same?

Mr Chemello: Yes, they are the same. They are intended to be the same. They are the same. The decision for Mount Emerald is now the same as the draft code. It is basically daytime 37 decibels, night-time 35 decibels, both outdoor.

Senator CANAVAN: Outdoor, of course. There is a lot of confusion about that point then.

Mr Chemello: Yes.

Senator CANAVAN: I am not the only one to—

Mr Chemello: No, not at all.

Senator CANAVAN: Indeed, I am not the only one to have read it. I had it pointed out to me. Just to be clear, you are telling us, and this is a parliamentary inquiry, that this condition requires Mount Emerald or Ratch Australia, the joint venture, to average their noise levels over 10-minute intervals and comply with below 35 dB(A) standard outdoor over those 10-minute intervals at night-time.

Mr Chemello: Correct.

Senator CANAVAN: Okay. Your area of the department is responsible for the broader noise guidelines that apply to other industries? I think it was 2008. No, you are not—

Mr Chemello: The 2008 noise policy is a Department of Environment and Heritage Protection noise policy.

Senator CANAVAN: So you do not know so much about that.

Mr Chemello: I know a little. I am happy to—

Senator CANAVAN: I have been told the noise guidelines in that 2008 guideline are lower than 35 decibels for coal seam gas operations, for example.

Mr Chemello: I do not know the answer to that. I do know that one of the contestable issues has been indoor versus outdoor and how much sound do you lose through indoor and outdoor. The technical advice we received was similar to one of the preceding speakers that the bare minimum was five decibels. In our view we move forward with 35 at night being equivalent to, at least, or at most, 30 indoors.

Senator CANAVAN: We have received a lot of evidence, and you mentioned earlier that some of the evidence seems to be that it is not the audible noise that is the major concern, it is the low frequency and infrasound. In A5.13 of your guidelines you have a detailed requirement here on how to manage low frequency and infrasound noises. There do not seem to be any particular thresholds or triggers, but they are at least an

addition on some other guidelines we have. My question is: are those requirements about low frequency and infrasound noise in this guideline being applied to the Mount Emerald project?

Mr Chemello: I cannot confidently say yes. They should be. The Mount Emerald guideline of course says 60 and 65 dBc.

Senator CANAVAN: Which are mentioned in that particular section.

Mr Chemello: I do not think that they are there—

Senator CANAVAN: I am not sure if you heard the earlier evidence?

Mr Chemello: Yes.

Senator CANAVAN: Of course dBc is not an infrasound—I do not know what the right word is, but it does not measure infrasound; you would need a different range. I know you have not got trigger thresholds here, but this particularly requires wind farms to have a noise assessment report to be submitted, including the assessment of potential impacts of low frequency noise and detailed mitigations measures to be incorporated. Will Mount Emerald be required to produce those noise assessment reports?

Mr Chemello: Yes. And I will correct my earlier answer: they are the same because the actual 60 and 65 are in the code, not the guideline. The figures that are in the code, the targets for decibel for low frequency noise that are in the draft code, are identical to the development decision for Mount Emerald.

Senator CANAVAN: So what does that mean in practical terms—that is, a noise assessment report? What does Mount Emerald have to do?

Mr Chemello: We still have to work that through. That is a process where they have to do a report and we need to agree with them on the process of monitoring. I think it gets back a little bit to the issue that you were talking about earlier on—the frequency of monitoring. That has not been specified in the development decision. That is a matter that we will need to agree, 'we' as in the chief executive of my department, who is the planning entity for SARA. The report needs to be done to the satisfaction of our chief executive and those sorts of arrangements should be worked out through that. It may well be a monitoring process of, every year or two or three, looking at what we have done. In some instances, not wind farms, we have used a scale-back monitoring process: you start monitoring more intensively and then, as the years go by, if there are no issues you scale back on the frequency of the monitoring.

Senator CANAVAN: But that will not capture infrasound then? It will not capture DVG?

Mr Chemello: We have always struggled with how to condition a development approval on a matter that you cannot measure. If you cannot feel it or see it and measure it, how can we condition compliance to it? There has been an issue there.

Senator CANAVAN: But you have seen Dr Steven Cooper's report. He has measured this.

Mr Chemello: Yes, I understand that.

Senator CANAVAN: Who have you received advice for? When you rely on that statement—I presume you, like me, are not an acoustician?

Mr Chemello: That is a good assumption! We used a variety of people. We used five firms on the way through for both Mount Emerald and the draft code—some of these people worked on both, some did not—including: Paul King, from MWA Environmental; Matthew Tulich; John Savory; Cardno; and Urbis. Now Urbis do not claim to be noise experts either, but they did the overarching work. John Savory, Matthew Tulich and Paul King were the three most predominant.

Senator CANAVAN: And they are saying they cannot measure infrasound?

Mr Chemello: It is an issue for compliance. We have yet to find a way that we can deal with compliance and how we monitor compliance for infrasound.

Senator CANAVAN: So you are not dismissing infrasound as not being an issue; it is just difficult to make people comply.

Mr Chemello: No, not at all. If we get the state-wide system and the state-wide code, one of the advantages of that is when research gets to the point where we have the evidence, which I think we talked about earlier on—that is, where we have got a much better way of measuring and dealing with it—we can then change that code relatively quickly and then all development approvals need to comply with that code.

Senator DAY: Are you familiar with the work of Dr Andrew Bell from the John Curtin School of Medical Research on this topic?

Mr Chemello: I know of it, but I am not an acoustics expert.

Senator DAY: It may be worth following up on that. He says that standard acoustic measures do not correlate well with wind farm annoyance. He suggests it is to do with wind turbine interference, with harmonics, and that that would be a more relevant measurement than the standard acoustic one. It might be worth following that one up. Can you take that one on board.

Mr Chemello: Yes.

Senator LEYONHJELM: You said in your submission that there is no retrospectivity about the code.

Mr Chemello: Correct.

Senator LEYONHJELM: Suppose you come up with a measurement method for infrasound, which is correlated with adverse health effects such as the kind that Steven Cooper seemed to find in Bridgewater. There is a measurement method agreed, and you put it into the code. I think you alluded that that is likely to occur. Does that mean it would not apply to Mount Emerald?

Mr Chemello: Retrospectivity is incredibly rare in planning approvals in Queensland. It is technically possible. We could not just deal with that in the code and say the code is suddenly retrospective. That would require a change to the planning act on that specific matter to say that the code is now retrospective. It can be technically done. We are in the same position as we are with pretty well everything else in our planning framework where our codes change and get updated. As people apply, they are assessed against the codes of the day and those approvals persist. The codes that now apply for high-rise residential retail developments are very different to what they were when most of those were approved and built—and we are living with them. We are in the same position. Technically it is possible, but it would require a change to the legislation.

Senator LEYONHJELM: The issue is that the evidence that we are receiving would suggest that smaller wind turbines are less likely to cause complaints of adverse health effects, but for the bigger ones they are almost inevitable—for example, the three megawatt turbines which are going to be built at Mount Emerald. It would appear, on the evidence we have received, that they will almost inevitably cause adverse effects on at least some of the people in the vicinity, including the people at the prison farm, which is four or five kilometres away. What prospect is there of altering the wind farm's conditions of operation should that occur?

Mr Chemello: There are two possible issues here. One is that I cannot see how they could occur in terms of the regular sound, because we have conditions in the DA. They need to comply with the conditions; otherwise there are hefty penalties.

Senator LEYONHJELM: It would be very low frequency.

Mr Chemello: You are only talking about ultrasound, because there is a regular sound condition and a low-frequency noise condition in the development approval that they need to comply with. I cannot see how someone who is four or five kilometres away could be affected by those, if they are complying with the conditions of the development approval.

Senator LEYONHJELM: The evidence we have received would suggest that they can be. We are still not sure, but the evidence from at least one of the acoustics experts would suggest that even 10 kilometres may be only barely sufficient. We are not sure whether it is under all circumstances, all people, or whether there is a dose-time response or that sort of stuff, but there are issues there. We are at the threshold of knowledge. You are a regulator rather than an acoustics expert, so I do not want to approach it from the wrong direction. However, if it became evident in the next two to five years that there genuinely was a problem with sound in the range of zero to 20 hertz, as Steven Cooper's work would suggest, and that the separation distance of 1½ kilometres is not sufficient to prevent adverse health effects, what could you do about it?

Mr Chemello: We would need to change the legislation to make a retrospective condition on those operating stations and that would possibly be done through my department but more likely, the way the government is structured, the environment and heritage department generally do the environmental authorities. So the ongoing permit for coal fired power stations, for example, is a permit about compliance that the environment and heritage department monitor as opposed to this department. Either agency could do it. As I said, that is technically possible but it requires a change to the legislation and an agreement by the government of the day to do that.

Senator LEYONHJELM: In developing this code, what was your view on the draft national wind farm guidelines? How useful or not useful was that?

Mr Chemello: I cannot really comment myself because I did not do that detailed analysis—not being an acoustic expert. I can relay conversations from acoustic consultants that were used that it was not particularly helpful.

Senator LEYONHJELM: Would it have been helpful to you to have had a national wind guidelines policy that you could have grabbed hold of?

Mr Chemello: Yes.

Senator DAY: Following the 2011 wind farm Senate inquiry, a number of recommendations were made, in particular regarding separation between residents and wind turbines. Every state adopted those separation guidelines except Queensland. Do you have any comment on why that might be?

Mr Chemello: No. I have been in the job two years so all I can say is we started on this journey two years ago in terms of our code. Our code looked at the national standards and produced a draft code that was not as good as it could be. The new code will be. So I cannot address what happened or did not happen in the past.

Senator LEYONHJELM: In your submission you have a mitigation aspect for EMI interference.

...where the proposed wind farm development is within close proximity to houses, for instance within 10km, it is recommended that baseline testing of television signals is carried out prior to construction, for picture quality and signal level. This may also apply to other broadcast and point to multipoint services such as mobile phone, commercial radio etc.

The code requires that where there is evidence that interference will occur, mitigation is required on the part of the wind farm operator.

What I am asking is: if it is sufficient for the code to require the wind farm operator to alter its behaviour so you can get a decent mobile phone signal or a television show—I am not attempting to have a go at you here—but why was it not sufficient to have a mitigation aspect in respect of adverse health complaints?

Mr Chemello: Can I take that on notice in terms of the infrasound. Certainly I think we have got that same process of regular sound and low-frequency sound. Is your question why have we not done that for infrasound? I will talk to acoustic experts about that.

Senator LEYONHJELM: The implication is that the wind farm may interfere with television reception, mobile phone reception and that sort of stuff. If it does, the wind farm operator is supposed to do something about it—that is simplified. If you can do that for phone reception and television, why could it not be done for—and I am not talking about DBAs or DBCs; I am talking about adverse health effects—why could that not be done on the same basis?

Mr Chemello: Not being an acoustic expert, I do not know the answer. I will track down. I make the obvious point that this is a draft code that will hopefully be released soon so we can address that through that.

Senator MARSHALL: Following up on Senator Leyonhelm's question, what are the adverse health effects of wind farms that we need to be able to mitigate?

Mr Chemello: I guess that has been the challenge in the whole process for the agency to work through that.

Senator MARSHALL: Under the establishment of the code in the guidelines, did you do a review? Did you find a single peer reviewed paper in a medical journal anywhere in the world that suggested there are adverse health effects from wind farms?

Mr Chemello: I think the most interesting comment to me in the National Health and Medical Research Council paper was that, of the 4,000 studies they said they reviewed, they found 13—I am paraphrasing—that had some technical validity. I think that is the issue that we have struggled with and that all agencies have struggled with across the country: the lack of valid research into the health impacts. As an agency and a regulator, we are trying to react to valid research findings, as opposed to—I am not being critical of particular people—unsubstantiated or semisubstantiated views, and we are trying to keep track of that process. So that has been an issue.

Senator MARSHALL: Nor am I. Are you aware of any peak health body anywhere in the world that holds a position that wind turbines have health impacts?

Mr Chemello: No.

Senator MARSHALL: Are you aware that wind turbines do in fact, in some cases, interfere with telephone and TV reception?

Mr Chemello: I have been told so, yes.

Senator MARSHALL: So, based on the evidence, you would then put the things in place to remediate those things.

Mr Chemello: Yes.

Senator MARSHALL: Of course, that would be logical. I do not have anything further.

Senator BACK: I do. I guess there was a time when Galileo was out on his own when it came to discovery, in the same way that the first person who discovered that microbes existed also incurred the wrath of his colleagues. But, nevertheless, that is by the bye. Mr Chemello, thank you for your agency's submission and for your evidence. You have within the department highly qualified and skilled acousticians, do you not—at least one?

Mr Chemello: No, we do not.

Senator BACK: You do not have any at all?

Mr Chemello: No. We are a planning department, so we deal with all matters of land use planning, and we bring in experts from agencies and external consultants whenever we need them. We do not have any traffic experts, for example, in the group at the moment.

Senator BACK: Within government, would there be that level of expertise that you could draw on?

Mr Chemello: Yes, there are a couple of sound experts in the environment and heritage department, which, contrary to some people's views, we did use through this process.

Senator BACK: So they have impacted, have they—or at least their expertise has been brought to bear in terms of the guidelines you have established?

Mr Chemello: Yes, and they will continue to be used—certainly in the publication of the draft guidelines again.

Senator BACK: Thank you. In terms of the project we are looking at at the moment, am I to understand that attenuation levels, outside to inside, were sought from the proponents but were not provided?

Mr Chemello: I cannot honestly recall that. I can inquire.

Senator BACK: It is my understanding that they have not been. I am just wondering how approval would then be given in the event that the technical information required had not been supplied.

Mr Chemello: The approval is given, of course, for the external noise monitoring, not internal. The reason for that was predominantly a policy position of the previous government not to condition a development that required monitoring and compliance to be done within people's homes. There was a view that we did not want to condition agencies so that people's houses would have to have gear set up in their lounge room or their bedroom.

Senator BACK: So, even though it was called for and not supplied, the approval still went ahead.

Mr Chemello: On the basis of the advice on attenuation between internal and external that we got from independent experts. The advice was that it was at least five decibels. We thought 35 equated to at most 30.

Senator BACK: Is there any evidence to support the view that 35 outside equates to 30 inside?

Mr Chemello: I know we have some. I will transmit it to the committee later.

Senator BACK: Yes, that would be fantastic if you would. The position that the federal scene finds itself in—or this committee—is that, as we all know, under the Constitution, it is a land management issue, so it is a decision of state authorities. The role of the Clean Energy Regulator at the federal level is obviously to provide the renewable energy certificates that underwrite most of these projects. The Clean Energy Regulator does not himself—or in this case herself—go out to satisfy themselves of compliance; they actually rely on the state authorities. So can that place you in an invidious position on an annual basis, in the sense that you have to actually satisfy the Clean Energy Regulator as to the compliance of any of these projects, including this one?

Mr Chemello: Not really. There is a logical link. If an applicant or operator of a wind farm is obliged to meet those standards of the Clean Energy Regulator, presumably, to get the payments—

Senator BACK: To get their payments—not presumably—

Mr Chemello: Then they need to do the monitoring. That is the same monitoring that we would be doing.

Senator BACK: In the case of Queensland, you are the body that advises the Clean Energy Regulator federally that a wind generator, or any renewable energy generator, is compliant.

Mr Chemello: That requirement from the national regulator would be embedded in the monitoring program. Our chief executive would need to reach agreement with the operator. So I guess if they have a different view to the personal view I would have about scaling back monitoring, you would do it every year or two years and then if there were no issues you would be cutting it back to every two, three or four years. If they required it annually or biannually that is what we would have to do.

Senator BACK: Given this question mark over the health effects of infrasound and given the fact that infrasound is not being measured and given the fact that the 35 decibels outside is really unknown to relate to the

30 decibels inside, has the department considered the legal aspects of the possibility of there being a legal action brought, either individually or by groups of people?

Mr Chemello: In drafting the code and the development approval conditions for Mount Emerald, we always take on internal legal advice, and sometimes independent legal advice. I am not a lawyer, but I understand that the planning legislation framework is really if the department—or the local government development approval—makes its decision on the best available valid information, in good faith, that is the protection they have under the legislation. The issue for us is whether or not the information has been validated.

Senator BACK: So you in government in Queensland, if not within your department, are in the happy position of actually having competent acousticians—people who seem to be highly regarded—able to actually do the monitoring and measurement to satisfy yourselves. Rather than just taking the word of an operator, you within government can actually satisfy yourself—

Mr Chemello: I see what you mean. No, not at all. The obligation is for the operator to do the monitoring and produce the reports to us.

Senator BACK: How does the department satisfy itself as to independence and to the fact that an operator and their acoustician does not have a conflict of interest?

Mr Chemello: There are significant penalties if they breach the conditions of their development approval.

Senator BACK: Would they be as high as the value of the renewable energy certificates for the operation?

Mr Chemello: I cannot answer that question.

CHAIR: If Mount Emerald were a CSG project, what noise levels would apply to it?

Mr Chemello: I cannot answer that question, either.

CHAIR: As I understand it, in the 2014 CSG approval conditions it is 25 dB(A), and this is outdoors. How could 35 dB(A) outdoors be justified for Mount Emerald when you say 25 for a coal-seam-gas project? Why is there 10 dB(A) external noise difference between a CSG project and a wind farm project?

Mr Chemello: I think CSG regulation is done through the Queensland government Department of Natural Resources and Mines, so it is a resource department that does those approvals, so I cannot speak in that behalf. The only relativities that I can recall and talk to are really about other state jurisdictions for wind farms, which are pretty well 40 decibels, and the Queensland government noise policy, which is 30 decibels indoors and 30 to 35 transmission loss. From the Queensland government wind policy, and looking at other jurisdictions, we reached the conclusion that 35 outdoors—37 outdoors during the day—were reasonable conditions. So I cannot answer the question about relativity to CSG.

CHAIR: Do you think there is an anomaly there? On the one hand it is 25 dB(A) for CSG and for wind it is 35 dB(A).

Mr Chemello: I do not know. I have visited CSG facilities, but I do not even know what noise a CSG well would produce. They are probably very quiet, so it may well be that technically that is not an issue—that is their volume anyway. I do not know, I am just surmising.

CHAIR: My question leads to this. If it is a problem at 25 for CSG, why is it not a problem at 35 for wind? They are the department's rules, Mr Chemello. I do not understand why there is an anomaly.

Mr Chemello: A correction—I guess they are not my department's rules; the regulation of CSG is done by entirely another department of government. The regulation of their noise is not something that this department gets involved with. Queensland is different to every other state in terms of the development framework. In other states you have resource development and urban development in the same framework. We do not, so our resource development—CSG, coal mining—is a separate agency, a separate approvals process, to the land use planning and development assessment that we do. I think we are the only state in Australia who has that separation, which is why I am saying that is a very different framework.

CHAIR: So there is not continuity between departments on noise—is that what you are saying?

Mr Chemello: Resource approvals are a different process to urban approvals.

Senator CANAVAN: I want to go back to some of the advice from internally in government, and I think to Senator Back's question. You did seek advice from other departments. I have a copy here, I think provided under freedom of information or whatever it is called in the Queensland government, and it is advice from the environment and heritage protection department to, I believe, your department, titled 'Noise review of the wind farm guidelines'. Their advice says: EHP requests that the authors consider the following with regard to the propagation and attenuation of low-frequency and infrasonic sound—low-frequency noise and infrasound cannot

be measured by dB(A); by design the A-filtering process filters out low-frequency and infrasound, low frequencies and infrasound need to be measured in dB(Lin). My question is why, in the code that I see, at least, is there not a reflection of that advice and no reference to dB(Lin).

Mr Chemello: I am sorry, I cannot answer that either. Can I take that on notice and get back to you.

Senator CANAVAN: This advice goes on to include a detailed figure in regard to the noise level that someone would experience given a source level, a sound, at the turbine itself, and then how far away you are and what noise you would actually experience. The department of the environment says here in regard to that figure: figure 1 shows the annoyance threshold between 20 hertz and 30 hertz for humans will be exceeded by up to four decibels while complying with the 35 dB(A) criteria. That is into the low-frequency zone, that exceedance. What have you done between the draft and the final to reflect that advice from the EHP?

Mr Chemello: Would you mind telling me the date of that advice?

Senator CANAVAN: I do not have a date on it, but I do have a document number—it says RTIP1314-135, Part 2, RTI document No. 207, and RTI document No. 206 as well, and 208. I presume RTI is 'right to information'. They might be three separate documents; I am not sure if they are just page numbered differently.

Mr Chemello: I will need to check whether that was information on the earlier draft or the current—

Senator CANAVAN: I appreciate you say you have taken that advice on; it just does not seem reflected in the final code that we have. You answered before that you are frustrated that there are only I think you said 13 valid or technical studies available. There appears to be a dearth of information—are you confident that by approving this project you are not going to result in people having adverse health impacts?

Mr Chemello: All we can do, really, is just assess and approve applications on the information available to us at the time, and that applies to wind farms or to any kind of development. There are always risks in approving any kind of development.

Senator CANAVAN: There is a risk that this project may result in adverse health impacts.

Mr Chemello: That is probably not a fair question for me to answer, or to be asked.

Senator CANAVAN: But there are risks. There are risks in coal mines, CSG, and I am on record supporting many projects in this state so I am not saying there should always be zero risk. One issue I do have is that you would presumably be familiar with the precautionary principle, and under the federal EPBC Act we cannot use the lack of full scientific certainty to stop measures that would protect the environment. Do you apply that principle in this case for these approvals?

Mr Chemello: The precautionary principles are in the Queensland planning legislation. It applies across the board to all planning decisions. So, yes, it is in the background of this.

Senator CANAVAN: And that relates to the impacts on human health as well? In the EPBC Act, of course, it only relates to irreversible environmental damage, but your act is broader, I presume?

Mr Chemello: Yes.

Senator CANAVAN: So it does relate to impacts on human health?

Mr Chemello: It relates to any effect on community economy and the environment.

Senator CANAVAN: So you are confident you have applied that principle here in this case? And under that principle you cannot use a lack of scientific certainty to not do certain things that would mitigate the impact on human beings?

Mr Chemello: Correct. The evidence that we have comes from a substantial number of wind farms operating throughout the world. There is a real dearth of scientific evidence that validates health research. I understand that there are concerns, and very valid concerns, from community groups, but, on the basis of where we are at this point in time, the department formed the view that we cannot say no to any wind farms.

Senator CANAVAN: It is common in the EPBC environment that, if there is a dearth of environmental evidence, the Commonwealth government will require, either as a condition or for approval, the proponent to undertake studies. It is a big impact in Northern Australia because there is often not a lot of scientific information in Northern Australia, and it is a big cost on development in Northern Australia. Have you asked RATCH in their proposal here to go and do more studies on infrasound? Have you at any time requested them to do that?

Mr Chemello: I do not think we have.

Senator CANAVAN: I am just trying to see the inconsistency here. If there is a green spotted frog somewhere—and I actually know of a real case at the moment where a boggomoss snail has held up a dam for five years now, at millions of dollars of extra expense for the proponents. Indeed, it is a government agency, in

your government, Mr Chemello, that is held up by this, under federal legislation. We seem to go to great lengths to protect this snail—and I love snails; there is nothing wrong with them—but why are we imposing such constraints to protect snails, yet, when there is a potential impact on human beings, we are not asking the proponents to do any further studies or help us fill the obvious gaps in the scientific evidence we have? Why are we not requiring them to do that?

Mr Chemello: Presumably in that instance there is actual evidence of the snails being there.

Senator CANAVAN: No; there is actually not. There are 850 snails near the dam site, but they cannot find any on the dam site. You do not want to get me started on this! I am very frustrated about the snails. There is a massive double standard here.

Mr Chemello: We would work on the basis that if, in the environmental context, there is an endangered animal identified in the area then, yes, there needs to be a management plan and some research wrapped around that. If there is a view that there might be something, but no evidence of that, then, as a planning agency, we generally would not take that on board, to research in case there might be something.

Senator CANAVAN: Would you have the powers to tell them to do more research, as a condition—to say, 'You need to fund \$2 million worth of research'? I have seen that in EPBC approvals—that you have to fund certain—

Mr Chemello: That is a grey area, delving into legal issues. In Queensland, our conditions must be reasonable and relevant. They are the words in our planning legislation.

Senator CANAVAN: There are no limitations against asking them to—

Mr Chemello: It is the reasonable and relevant test.

Senator CANAVAN: Okay. I will leave it there, Mr Chemello. Thank you for your evidence.

CHAIR: Mr Chemello, as a responsible planning authority you are charged with ensuring that the health and wellbeing of the community are not affected. Could you provide to the community what are considered by the department of planning to be adverse health impacts that will affect the wellbeing of the community? Secondly, what are the limits, in terms of emissions from a wind farm, that are present to ensure there are no adverse health impacts? Can you take that on notice?

Mr Chemello: Okay.

Senator DAY: I would like to follow up on my earlier question as to why, after the 2011 Senate inquiry, Queensland did not take any action regarding separation and so on. Given your evidence of what appears to be the department's lack of understanding of the difference between audible and inaudible sound, do you consider that the regulation of wind farms may be too hard for state governments, or do you jealously guard your jurisdiction in this area? What is your view on how this might be taken from now on?

Mr Chemello: I do not agree. Land use planning and development approval decisions are the responsibility of the state. The fact that some things are harder than others just makes our lives a bit more difficult in some instances, but it does not mean that it makes it any easier for a national government to deal with the same issue that the states need to deal with. The issue is not so much the level of competence of departments and agencies; it is the scientific uncertainty about some of the issues.

Senator DAY: It seems to us that the keenness to pursue scientific evidence regarding the impacts on humans does not come anywhere near what Senator Canavan was saying is the scientific evidence and research on snails, frogs, plants and so on. It does seem to be a double standard. Here we have dozens—hundreds—of people claiming all sorts of adverse health impacts, and yet we come up against a brick wall, or a blank canvas, when it comes to government departments and agencies willing to explore this. It seems a bit strange, to say the least.

Mr Chemello: With respect, I would struggle with saying we are a blank canvas and not responding. We have responded with a detailed assessment to this particular call-in process under the laws that applied that we had to deal with. We responded with a draft code. We got community response that that was not quite up to scratch. We got another draft code. So we are actually moving and dealing with the best evidence we have available. This draft code, for example, has the 1½-kilometre distance that only appeared in the National Health and Medical Research Council report back in February, so it is not that old. We are responding. I cannot defend previous years, but I think that we are being very responsive.

Senator DAY: I do not want to invoke the snail's pace too much, but it seems to be going very slowly.

CHAIR: Thank you.

Proceedings suspended from 10:36 to 10:50

PAGANI, Ms Marjorie Elizabeth, Division 6 Councillor, Tablelands Regional Council**PATTISON, Mr Peter, Senior Planner, Tablelands Regional Council**

CHAIR: Whilst people are sitting down I would just like to remind you, if you did not hear earlier, that there will be an opportunity at 2.45 for members in the public gallery to make a short statement to the committee. If anybody wishes to take up this opportunity, please speak to the secretariat. Thank you.

Ms Pagani, Mr Pattison, could you please confirm that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Ms Pagani: It has.

CHAIR: The committee has your submission. I now invite you to make a brief opening statement. At the conclusion of your remarks I will invite members of the committee to put questions to you.

Ms Pagani: There are a number of key issues that I would like to address by way of an overview, during the course of which I want—with your lead, Senator—to respond to some of the matters raised by the RATCH team. I should stress that my division 6 has about 3,500 people in it, almost all of whom live within 10 kilometres of this site. And they are almost in total, the significant number of residences within five kilometres, and that equates to about 2,500 people, who are all in my division. I also, of course, speak for the people on the western side of the mountain. About 10 per cent of the population who will be affected are in the Mareeba Shire; the other 90 per cent are in the Tablelands Regional Council, which incorporates, in large part, the old Atherton Shire. I speak for them because I am on the ground with them. You see that about 100 of the people from that area have come here to hear this inquiry.

One of the significant issues we have is in the wind assessment process. You have heard that it was a Tablelands Regional Council application for Mount Emerald. Upon deamalgamation it went to Mareeba. Mr Chemello was uncertain, but it was the Mareeba Shire Council that asked the government to call it in, not Tablelands Regional Council.

From a geographic point of view it is worth noting that the surrounding area is in the Tablelands Shire. The mountain itself—or the range—is hived off and sits over in the Mareeba Shire, but physically it is directly behind the Tablelands Regional Council—hence our interest in it. Ninety per cent of the total number of people affected will be people in the Tablelands Shire. It is a difficult process we have been through. Our council wrote many letters to the department asking for consideration for input and giving our view on what would be suitable protective measures for our residents. Each and every letter was ignored by the government. We had no input, we had no acknowledgement of our right to have an input, and that was totally unsatisfactory. I can only guess that that was because the mountain was not in our shire any longer, notwithstanding that the people are.

There is further concern. You heard Mr Chemello saying that he was in the process of state planning matters in developing a wind farm code. Tablelands Regional Council drafted a renewable energy facility code, bearing in mind that we had no state legislation relating to the development of wind codes. Mr Chemello says the state has a wind farm policy. It does not; what it has is a case-by-case basis. I was saddened to hear Mr Chemello say that we cannot say 'no' to any wind farms. That was an extraordinary statement. To give you an example, when our council sent in our renewable energy facility code, we have to get permission from the state before we can take it out to public consultation. A couple of important things happened when we sent it out, and one of the remaining items that we have yet to argue with the government about, and I am sure we will now lose, is that we decided that we should have two-kilometre setbacks from property boundaries. Mount Emerald is 1.5 kilometres from existing receptors, meaning that anybody who wants planning permission to build on the tops of their blocks—and remember that we have got a lot of large rural communities here with big blocks of land—will be likely to face from our council acknowledgements and waivers if they are going to put anything on their properties closer than 1.5 kilometres. Our council decided on two kilometres from boundaries.

That is yet to be approved, of course, but when we sent in our initial draft, a couple of important changes were made by Mr Chemello's department. We had addressed the purpose and outcomes for our renewable energy facility code, and our purpose was to ensure renewable energy facilities were appropriately located, have minimal impacts on the environment and on amenity and have social, environmental and economic benefits. That was changed by the department—and bear in mind that we are not allowed to go to public consultation with anything that is not approved, so we must change it to suit what the state wants. They changed that to 'the purpose of the renewable energy facility code is to facilitate the establishment of new or expansion of existing facilities in appropriate locations'—a total change in focus from what we wanted. Other changes included that they removed reflection and radiation concerns from consideration at all in management plans; they removed consideration of vibration within noise impacts and they have also altered our site access, which we had hoped would not cause

nuisance beyond the boundaries of the site. They removed that and changed it to a requirement that post-construction impacts are minimised. We do not know what any of that means, but we do know that everything we wanted was watered down.

Senators, I realise opening statements have to be brief, but I do want to quickly address a couple of things that were raised by RATCH. When this project was started it was Mount Emerald Wind Farm Pty Ltd, a \$2 company with two shareholders—RATCH and Port Bajool—with \$2 in paid up shares. When I heard the legal adviser for RATCH say that it was not a \$2 company, I then asked one helper up the back to go and do an immediate ASIC search because I thought something must have dramatically changed here. It has not, and I would be happy to send to you today's ASIC search. It is still a \$2 company with \$2 in paid up shares.

CHAIR: Ms Pagani, could you give the secretariat a copy of that, please.

Ms Pagani: I will do that today. The other issue was that you heard the legal adviser, or it might have been Mr Johannesen, say that there is an agreement with council for three-year periodic monitoring. From the start I can say that the company—the installation in its various company ownerships—was non-compliant, as far as council is concerned, from the year 2000 to 2012. Action was taken because Tablelands Regional Council started the process and ended up having to bring court action. That took \$250,000 of funds from a very small council.

There was a very flawed process in which RATCH said it lost four to six weeks of data—or it was corrupted, I am sorry. That was during the windiest time of monitoring. I then called upon RATCH to provide the corrupted tapes so they could be independently examined. They told us that they had destroyed them.

A previous issue arose with Transfield when Mr Terry Johannesen was the recipient of complaints, way back in 2010—I was surprised that he thought that complaints only started when RATCH owned the property, later—and he was asked to provide the documents relating to noise complaints when he was an employee of Transfield, and he advised the complainant there that all records had been lost in the Brisbane floods. So we either lose them in the floods or we corrupt them or we destroy them, and that is one of the reasons why we urge that there be independent testing and compliance.

Mr Johannesen also said that council found—he used the word 'found'—that there had been no breach. That is totally and absolutely wrong. There was no such finding. What council did was this. There was testing done. Council was not satisfied with that. But, because different standards from the standards in the permit were used—that is a later New Zealand standard—which did not apply the five decibel amplitude modulation penalty, which all experts found to exist, because the wrong standards were used, there was a 0.6 compliance, a marginal compliance. The council decided that it could not take that any further because it did not have sufficient evidence in light of the funds. There was never a finding that there was no breach. Indeed, what the council then did was to resolve—before de-amalgamation when we were a joined council with Mareeba Shire—to have independent testing done. When we de-amalgamated, we were a smaller council with the mayor having a casting vote; she used it, and that, on our very first meeting, did not go ahead. But one of the issues we had about that—and this is apropos of the statement, 'We have agreed with the council for three-year testing', which is wrong—is that, when we asked for access to the data, so as to assist our independent expert, we were told that there were a lot of conditions attached, including a high cost to us to get the data, and we were reminded by the solicitors for RATCH that it was not publicly available data: 'The information from Windy Hill weather station is not publicly available,' and then a big list of conditions. This is a letter I am reading from, of August 2013, which is the last we have heard from RATCH. I do not know where the three-year agreement came from, because I know nothing of it; nor does the senior planning officer, and he has all the recent correspondence. It says: 'Our client'—that is, RATCH—'has informed us it has progressed arrangements with respect to undertaking periodic noise monitoring at locations surrounding the wind farm, as required under condition 38. Our client will contact your client shortly with a further update and a proposed commencement date.' That has not happened. And I am happy to tender that and the whole chain of correspondence so that you, Senators, have to hand all of the information that passed between the two.

In brief, one of the real concerns we have is about the monitoring and compliance conditions. We know, from our Windy Hill experience, which cost far more than any little council can pay, that the flow-on effect from that is that, if we cannot take them on, how can the residents?

We have complainant residents, which is why Tablelands Regional Council set about its task of trying to make them comply. All of the business you heard about 'We've done so much testing,' is a nonsense. The first testing which we required after the complaints in 2011, when RATCH bought the property—they did six hours of testing. They were supposed to test over a three-month period. Our council said, 'That's not good enough. Do it properly.' In the end, we had to go to the Planning and Environment Court, hundreds of thousands of dollars later.

Then we get the flow-on. The affected residents cannot take us on and they cannot take on RATCH, because even the council cannot afford to take them on. So I reject any notion—and the present Mount Emerald Wind Farm really allows them to be in charge of monitoring their own compliance. There are no conditions. Mr Chemello says, 'We'll have to sort that.' Well, I heard Mr Kempton outside a moment ago, saying to the RATCH people, 'It's a done deal.' So I do not know where the negotiation is going with Mr Chemello, because it is not something we know about. Significantly, the affected residents—3,000 or so of them, particularly 2½ thousand within five kilometres—they do not even respond to us. We are the representatives of those people. The state does not respond, and RATCH certainly does not respond to us. They have no communication with us at all. Thank you.

CHAIR: Thank you. Senator Back?

Senator BACK: I am concerned at the evidence that was given to us indicating that 70 per cent of the community supported the project when we have obviously had advice to the effect that 90 per cent do not. Who do you believe that community was that was surveyed to come up with the figure of 70 per cent in support, Ms Pagani?

Ms Pagani: I know who that was, because I have all the figures from RATCH's own survey. It reported 76 per cent of respondents supported it, but, of those, 86 per cent said they knew little or nothing about it. Nearly one-third of the 400 people surveyed lived more than 20 kilometres from the site. Seventeen people lived under five kilometres. Nobody at the two-kilometre limit was asked.

Senator BACK: How many lived less than two kilometres from the proposed site?

Ms Pagani: None.

Senator BACK: Zero?

Ms Pagani: No.

Senator CANAVAN: How many in total?

Ms Pagani: There were 400 people surveyed. Seventeen lived under five kilometres and a third lived over 20 kilometres away. When the community citizens got together and did a very professional survey, which was open and transparent and available to RATCH for comment and criticism, 700 residential addresses within five kilometres were posted to, and the reflection there was: 91.7 did not support, 3.5 did support and neither way was 4.8.

When I asked at the public meeting in Mareeba, Senator Back, I questioned Mr Geoff Dutton, who was then representing RATCH, about this. He said, 'What are you suggesting—the survey company is dishonest?' I said, 'No, but I can get an advice on anything changed, depending on the way I ask the question.' I said to him, 'I would be more inclined to accept your figures if you would be prepared to give to me the instructions you gave to the survey firm.' He said, 'Well, Marjorie, we both know that's not going to happen.' That was his response to my request for transparency about that survey—simply refused to give us any details. It would have been a simple matter if one was transparent: 'Here are my instructions to the expert.' And he refused to give that.

Senator BACK: Yes, the point was made in Parliament House the other day that there could be some wisdom in dividing the number of proposed turbines by the 150 federal electorates and there would be equal numbers in each of the 150, and the local member could give advice as to where each turbine should be placed. I think again it would come back to the issue that a lot of people are in favour of a lot of areas so long as it does not affect them. Given the shortness of time: there has been mention of a \$200,000 community benefit fund. Is that something you can inform or advise the committee on? Is that something that has come before council? Is it attractive to council?

Ms Pagani: It has not, and there are no guarantees. I am not confident. I can tell you that our council wrote again to both the developer and the states saying that we wanted some guarantees about road repairs. The roads are all in the Tablelands Regional Area, not Mareeba. And Mr Dutton publicly came out and said, 'That's a nonsense; you're treating us like a Third World developer; our word is our bond.'

Senator BACK: I will just make two points, if I may, in connection with that, because in a previous hearing we heard that these funds do have a fairly strong caveat on them, and the caveat is for those who receive the funds and are the beneficiaries of them that they actually bind themselves to not criticising the source from which the funds come. That is something that you might be aware of. My final question then relates to beneficiaries. Regarding the proposed very extensive wind farm, are the turbines to be placed on private properties, in which case there will be hosts?

Ms Pagani: No, they are all on Port Bajool land, which is Mount Emerald, which is in fact the northern Herberton Range. That is all owned by Mount Emerald, and that whole range is the bit that is hived off and now in Mareeba Shire. I can tell you that there has been no approach to our council. And what could well happen if there is a community benefit fund as promised is that it will go to the Mareeba area, because that mountain is in the Mareeba Shire, although all the affected residents are in the Tablelands Regional Council. But there was one offer of \$10,000 to the Tolga State primary school. During the course of the push to have it approved, when it was with the Tablelands council, that school rejected their offer outright, because in the case of the bulk of the residents, the parents of those children live in a suburb called Range View, which now some of the people behind me have renamed 'Turbine View'. And because of the division it would cause and the attempt at politicisation of the children at the school, the school wisely rejected it.

Senator DAY: You quoted Mr Chemello saying, 'We simply cannot say no to any wind farms.' You have your own doubts and concerns, and Mr Church on 19 March this year said that small regional councils are generally underresourced and lack the financial and technical capabilities and so on. Given that, do you feel that your council also cannot say no to wind farms?

Ms Pagani: I do not think our council is of that mindset; I can say that. Let me just refer you to High Road. I was interested to hear Ms Johannesen say that that is about to fall flat, or fail, or be withdrawn, or something of that nature. It was approved with proper conditions by our council. Then RATCH agreed to participate in a negotiated decision notice process, which would give our council the right to make certain decisions. They then, after having agreed to that and seeing the conditions, chose not to agree with it, and that project has never advanced, and now we hear them today saying that it is not going to go ahead. I would suggest that the reason for that is that it is conditioned, and our council had the intestinal fortitude to properly condition it, notwithstanding what may have been regarded by some as pressure from the developers.

Senator DAY: I guess rather than that you feel you cannot say no, my question is: why do you say yes when you admit that you do not have the technical capabilities and inspectorate resources to ensure that they do comply with your own conditions? Do you feel that you are in a position to simply say no?

Ms Pagani: The difference is whether we can accept the cost of the assessment process, as opposed to saying yes or no to an application. When Mount Emerald came in for application, it was a \$5,000 to \$6,000 application fee. I do not need to tell any of you here that was a ridiculous fee. Those fees are set. What needs to happen, for little councils like us to be able to properly assess these, is that proper guidelines have to be put in place that truly reflect the cost of assessment. I can understand why Mareeba sent it to the state, because it would have had that cost, and that initial \$5,000 was paid to the Tablelands Regional Council, which was well expunged a long time before the transfer.

So there are two questions, Senator, I think. Yes, councils can be brave enough to properly assess and condition, and we have done that with High Road; but not for the \$5,000 application fee. What we can charge needs to be reflected in the guidelines—a proper fee—so that we do not have to say, 'Send them off.' Although that is now superseded because, as you have heard Mr Chemello say, SARA, when it develops this code, is going to be the assessment agency in any event.

Senator DAY: I just wonder, given the evidence we have heard at both this hearing and the previous one, at what point do you through your hands in the air and say, 'We can't'? For example, if there was an application for a nuclear power plant in your shire council area, at what point do you say, 'Look, we just don't have the expertise or resources here to properly monitor and ensure the health of our ratepayers'?

Ms Pagani: Again, it comes down to money. For example, you heard Mr Chemello say he has no acousticians and no experts—just a planning department doing all this important noise stuff. Councils can do that but they have to be funded to do it, and what needs to happen is there needs to be security for costs in the approvals process, so that councils can properly monitor. We hear yet again that this monitoring is probably going to be in the hands of the developer. We saw what happened there with Windy Hill: it does not work. We need proper funding to enable us to do it.

Mr Pattison: If council receives the development application, then it has to decide on that application one way or another; it has to make a decision. In the case of High Road, council made a decision and came up with a set of conditions that would be applied to that approval. In the case of the Mount Emerald wind farm, the minister called it in and it was the minister's decision. If council decides something then the developer, if it does not agree with that approval, can appeal that decision to the Planning and Environment Court, which can be a very costly process for the council. In a ministerial call-in situation, there is no right of appeal. That is the difference—council remains exposed to the consequences of their decision; the minister does not.

Senator MARSHALL: Mareeba council seems to be very enthusiastic about the project. Can you explain why there seem to be diametrically opposed positions from adjoining councils on this?

Ms Pagani: I am not surprised that Mareeba is in favour of it, given the promises of employment. But only about 10 per cent of the Mareeba Shire people will be affected, so it is not going to affect them in a negative way.

Senator CANAVAN: Let me just clarify that: ten per cent of Mareeba Shire's population, or 10 per cent of the people affected are in Mareeba Shire?

Ms Pagani: Sorry—ten per cent of the people affected live in Mareeba Shire. Their flak will be small because their people do not live where the mountain is. It is an artificial boundary. All they can look at is: will there be jobs? Will there be benefits and perhaps a community benefit fund? On that point, it surprises me because the original application—which I have read—said there would not be even one full-time position in the long term. We are now hearing about hundreds of people working there. I do not know why that has changed. Originally we had 80 turbines on the application; we now have 63 on the approval, and our full-time worker positions have gone from less than one to dozens. Maybe that is the sweetener for Mareeba. I think more likely than not there are no negatives for its people.

Senator CANAVAN: I heard you say that you believe the conditions you placed on High Road are more substantial. I would like to expand on exactly how they are more substantial.

Ms Pagani: Over to Mr Pattison, because he is the planner who is more familiar with the exact conditions there.

Mr Pattison: In summary, there is a 30dB internal noise limit with a maximum 35 external as opposed to the 35, 37 for Mount Emerald which are both external.

Senator CANAVAN: Do you believe that that has made a material difference as to whether or not this wind farm can be built under those conditions?

Mr Pattison: It would certainly require RATCH to go back and redesign the layout of the turbines, in my view. If at some stage there were a 1.5-kilometre setback applied then it would probably render that project unviable in my view.

Senator CANAVAN: How much closer to home is it for this project under the current proposal?

Mr Pattison: My recollection is there are three existing dwellings within 600 metres of a turbine.

Senator CANAVAN: And that is approved, providing they can meet the sound requirement?

Mr Pattison: Technically, because RATCH has asked for a negotiated decision on the council's approval, then there is no approval until that negotiated decision request is decided. So, technically, they do not have anything at the moment.

Senator CANAVAN: Ms Pagani, I do not know if you covered this in your opening statement, we know that in the two kilometres, I think, there are nine dwellings and around 50 people or something like that. Within a broader range, can you describe—I went out there yesterday—there are residential estates. Can you describe the area in that sort of five-kilometre—

Ms Pagani: Within five kilometres, there are about 2½ thousand people. Some of them, of course, are up as close as 1½ kilometres and it seems to be that is why that number was chosen. Those people are living in substantial properties. It is quite a wealthy neighbourhood in terms of the residential area. Many of them are self-funded retirees and young families who have put a lifetime of savings into these properties. Their concerns are—and it has been borne out in a recent court case involving the Tablelands Regional Council—that the sales in the last few years since this proposal was mooted have almost stopped. People were being told as late as last week, 'Don't bother listing your property for sale. While this is going to go ahead, you won't sell it.'

Senator CANAVAN: What area is that?

Ms Pagani: It is called Rangeview.

Senator CANAVAN: That includes areas that are three to four kilometres away? They are acreage but they are not farms—

Ms Pagani: They are small acreage—more small luxury homes. There are 400 homes in Rangeview. There was a development case in the Planning and Environment Court recently—Pensini & Anor v Tablelands Regional Council & Anor—and it was not related to wind farms, but it was about how much development and how much more land needs to be cut up. One of the areas was the Tolga area which abuts the wind farm site. Under cross-examination, both of the real estate experts said they had to admit there was not anymore need for rural residential land, because they could not sell any of what was there while this wind farm proposal was still being proposed.

There are people—and there are some of them here in the audience—who have been told in the last week, 'Don't bother, unless you want to give your house away, trying to sell it now that it's been approved.'

Senator CANAVAN: When I went out there yesterday there was some evidence provided to me that—and I did not get time to ask RATCH directly, unfortunately—some clearing has already occurred on the site, obviously prior to the state government approval.

Ms Pagani: Yes. I have seen all the photos, aerials and maps of this on the ground, taken by people who are here and may get the opportunity to speak. Wholesale poisoning appears to have occurred on each of the turbine sites, and clearing of vegetation laneways and poisoning of watercourses. This appears to have been done before the environmental impact statement occurred. If one walks across all of that land—it is very clear—there are no animal droppings and there is no sign of any animal life on these turbine sites. There are poisoned tracks on either side of the creek. It is very clearly depicted, and hopefully the person who speaks, who actually took the photographs, will give them to you. There is cracking of the trees, which is caused by poison, and a stench of poison in all the waterways. If one goes outside the turbine proposed circles, it is thick, lush cypress pine vegetation and undergrowth with signs of wildlife.

One can only assume that some action has taken place. Certainly, there have been no permits. As you would know, under the EPBC Act they cannot take any steps in that regard until there is approval; but this occurred prior to the environmental impact assessment.

Senator LEYONHJELM: Does that currently come under your jurisdiction?

Ms Pagani: It does not, because the mountain itself is in the Mareeba Shire.

Senator LEYONHJELM: Do you think that Mareeba is aware of that?

Ms Pagani: I do not know.

Senator CANAVAN: It is also presumably governed by the native vegetation act, and whether there are any EPBC threatened species.

Ms Pagani: That is it. In terms of the state act up there—

Senator CANAVAN: That is with the federal government.

Ms Pagani: if approved, they do not have to comply with the Vegetation Management Act in the state, but they certainly cannot do anything, or take a step, until there is approval. That has clearly been done.

Senator CANAVAN: Chair, with your and the committee's indulgence I would like to table some photos from the site, which do appear to show clearing in some locations, presumably where turbines will be located. Is that okay with the committee?

CHAIR: Yes.

Senator LEYONHJELM: I am just trying to establish: the High Road Wind Farm has not proceeded. It has not been built. That is the one they were referring to.

Ms Pagani: That is correct.

Senator LEYONHJELM: They said they have an approval, but they have not built it.

Ms Pagani: They do not. They have an approval subject to a negotiated decision notice, as Mr Pattison just said. They agreed to that process, then decided not to agree on it. So there is no formalised approval.

Senator LEYONHJELM: Presumably the reason that they have not proceeded is that they do not have an uptake agreement—anyone to sell the power to. It is all contracted—is that right?

Ms Pagani: I think Mr Pattison is quite right when he says that if they had to subscribe to the conditions that are required by the council, they would have to redesign the whole thing and maybe they could never comply with the noise conditions or the reporting conditions.

Senator LEYONHJELM: That is interesting. I was reading through these conditions, and you have there the 35dB at 10 minutes and so forth, but you also have a condition in there:

In addition, perceptible or audible noise from wind farm activity shall not affect human health or wellbeing, including sleep or relaxation.

That seems to take account of this issue that we are hearing about from people, that there is something more to it than just audible sounds. When did you write that—was it back in 2010?

Mr Pattison: 2011.

Senator LEYONHJELM: 2011, was it? Has that been raised as an objection by RATCH or any of the other people involved?

Mr Pattison: In its negotiated decision submissions, RATCH disagreed with the inclusion of that requirement within the conditions.

Senator LEYONHJELM: Did they give a reason?

Mr Pattison: I cannot recall that offhand.

Senator LEYONHJELM: But if they thought that their enterprise was innocent—innocuous, if you like—to neighbours, which is the assertion that they made here, they would not have any objections to that. Do you have any feeling as to where that clause sits in the scale of objections to these conditions?

Mr Pattison: Off the top of my head, I would say that they regard that as a significant issue.

Senator LEYONHJELM: I thought that might be your answer. Another one that caught my attention was the 'cash bond of \$40,000 for any costs associated with monitoring and verification'. Has that been raised?

Mr Pattison: Again, I cannot recall, it being back in 2011.

Senator LEYONHJELM: Yes, understood. Now, supposing the Emerald Hill project proceeds as intended, and we have heard nothing to suggest it will not, what will council's role be—and I am sorry if this has already been asked and you have answered it earlier—in terms of compliance with any conditions? Will it be involved in access, vegetation control, native species, noise? Will it have any role whatsoever?

Mr Pattison: No.

Senator LEYONHJELM: None at all?

Mr Pattison: The approval is given by the minister, the minister is the assessment manager and the minister owns it wholly and solely.

Senator LEYONHJELM: And that is for the life of the project; the council have no role?

Ms Pagani: That is correct.

Mr Pattison: Correct.

Senator LEYONHJELM: Thank you.

CHAIR: Ms Pagani, earlier you spoke about the poisoned areas of land adjacent to the creek, and the smell. Does the Queensland state government have rules pertaining to any developer, in any other industry, who goes ahead and allegedly does this poisoning? Are there penalties for this for any other industry?

Ms Pagani: There would be. I am not an expert in this area, but certainly there would also be penalties for this industry, because it has occurred before approval. Now, they are exempt from the state Vegetation Management Act after approval is given; but this destruction, it appears, occurred beforehand, so they then face the same penalties as any landowner who does not comply. This mountain has significant vegetation areas on it, right across it, and significant wildlife habitats across it, even to the point that the southern cassowary is allegedly on one of the ridges. I cannot say I have ever seen one. But they would or should suffer the pains and penalties arising from significant breaches of the Vegetation Management Act and associated legislation. They would have had no right to clear, absent a permit to develop the wind site.

Senator CANAVAN: Just to clarify, I had been told that they had already been exempted from the Native Vegetation Act, but you are saying it was after approval?

Ms Pagani: Yes, after approval, when destruction—

Senator CANAVAN: The approval that occurred only a matter of weeks ago?

Ms Pagani: That is correct.

Senator CANAVAN: This allegation of destruction of native flora occurred—

Ms Pagani: Well before approval.

Senator CANAVAN: well before that approval.

Ms Pagani: Yes. No, they do not get any exemption, as far as I am aware. They are just a normal landholder.

Senator CANAVAN: I misunderstood that, Chair. Could I request, through you, that the committee write to RATCH with this evidence and ask them to explain what they did up until the approval; also, could we write to the federal Minister for the Environment about this evidence to ensure that the federal Department of the Environment look into this matter in their EPBC consideration.

CHAIR: Yes. Ms Pagani, just for clarity: you said there were 2½ thousand people living within five kilometres of the proposed Mount Emerald wind farm—

Ms Pagani: That is correct.

CHAIR: okay—and 90 per cent of the people affected by this proposed development are in the Tablelands Regional Council, but you are excluded from the decision-making process because the Mount Emerald wind farm is situated in Mareeba Shire?

Ms Pagani: Yes. There are two reasons. That is one; the other is that it was a code-assessable project and so there was no right. It was not impact assessable, so there were no rights for objectors; there are no rights of appeal for the people. Everybody has done their best to object in whatever way they can, but they do not have a right to do that. It is code assessable. If they did have a right then they would not be—and have not been—listened to, given that it is not in the shire of the affected people. So, yes, Tablelands Regional Council has been powerless. We have tried to approach the state government with suggestions, with our energy code and with protections, and they get stamped out.

CHAIR: So the Tablelands Regional Council and its staff in effect are powerless, yet they are hammered.

Ms Pagani: That is correct, and I am sure that if this thing goes ahead, given the proximity of Tablelands Regional Council residents to this site, the complaints are going to come in thick and fast to the TRC, because people understand that it is the council who looks after them. Yes, they will all be told, 'It's not our deal; go and see the state,' but that will not stop it. I can see it will take up massive resources. We have it in the chicken industry, for example, which has been referred from us over to DAF, the state department. That causes a lot of issues with residents—the smell. We are inundated. We sometimes have three or four staff allocated to trying to explain to people that they now have to go to a state department, and they are tiny little microcosms of development compared with this. So I see it ending up being of grave concern to the TRC.

CHAIR: Just for clarity, again, according to the TRC, which was the project that you said was noncompliant in the Tablelands region, in the council's opinion, between 2000 and 2012?

Ms Pagani: Windy Hill.

CHAIR: And the proponent for Windy Hill was RATCH-Australia?

Ms Pagani: Yes. It took over in 2011, but Mr Johannesen was employed by Transfield, and he was getting the complaints from at least 2010—that is on our records. But, until enforcement action was taken by the TRC, there was no real attempt at any compliance.

CHAIR: Finally, you spoke about the results of testing. For clarity, once again, you said that, when you asked for copies of testing that had been undertaken by the proponent, they claimed it had been lost or destroyed.

Ms Pagani: Yes. Firstly, there was a period of about six weeks of high wind. That was omitted from the data when the figures were being done—and bear in mind that we had ended up with a 0.6-dB compliance without the amplitude modulation penalty, which would have been five, so that would have taken it up to way over the noncompliance level. When I read the reports and discovered that there was this missing data, I caused the council officers to write to RATCH to say, 'Where's the data?' They said, 'Oh, that portion had been corrupted, so it wasn't of any value.' So we wrote again, and I said, 'Well, give us the corrupted data tapes, and we can have them looked at to see what we think about the corruption.' They came back to us and said, 'We destroyed them.'

CHAIR: You were talking about wind. That is in what you call your dry season, which you are coming into now. Is it around that time?

Ms Pagani: Yes. I can get these reports to you.

CHAIR: I appreciate that.

Ms Pagani: Peter, do you recall the destroyed data? Was it around August? I think it was before Christmas.

Mr Pattison: I cannot recall.

Ms Pagani: We cannot recall. I will have to get it, but I do recall, significantly, that it was a period when we would normally expect to experience reasonably high winds. But, in any event, it concerned me that there were six weeks of missing data out of a three-month study, and I was surprised given that this was in the middle of a court case. We were before the court at this stage, there had been no resolution and I was very surprised that any litigant in court proceedings would destroy evidence in the middle of court proceedings. That is apparently what happened. That is what we were told, anyway.

CHAIR: So, for a time of the year when high wind is characteristic of that time of the year, that was considered to be a problem?

Ms Pagani: I think the problem was more that there was six weeks of data missing, irrespective of what the time of the year was. Six weeks out of the three-month study was missing and allegedly destroyed during the course of court proceedings.

CHAIR: Thank you, Ms Pagani and Mr Pattison, for your evidence today.

McPHERSON, Mr Geoffrey Robert (Geoff), Private capacity

[11:40]

CHAIR: I now welcome Mr Geoff McPherson. Before I continue, do you have any comment to make about the capacity in which you appear?

Mr McPherson: I am a Marine Acoustic Biodiversity Solutions director. I am also an Adjunct Principal Research Fellow at Intelligent Systems, Information and Modelling, College of Science, Technology and Engineering, James Cook University. I have been asked to make known some information on underwater noise—noise research.

Senator CANAVAN: You are not here representing anyone?

Mr McPherson: No.

Senator CANAVAN: You are here in your personal capacity as an expert in this field.

Mr McPherson: That is correct. I am talking about science. I am not representing any group or any NGO at all.

CHAIR: Could you please confirm that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Mr McPherson: I believe that is the case.

CHAIR: I now invite you to make a brief opening statement. At the conclusion of your remarks I will invite members of the committee to put questions to you.

Mr McPherson: My involvement with wind turbines is primarily from travelling overseas. I would have to say that I do not have much experience with wind turbines here. I never said that I had. My comments will come from an underwater perspective and what we know of science and noise. There are two comments that I would like to make in reference to an earlier comment. I was going to skip it, in terms of my capability, for the sake of brevity. I was an employee of Queensland fisheries, the Queensland government, for 37 years. I was a little amused, because many of my memos used to say: 'Queensland—a place where noise does not exist.' That was very common. There was never any interest or desire to get involved with noise.

On the terms of reference, my submission will be presented as an observation of the anthropogenic noise impacts on animals in aquatic environments. Science is steadily improving in the methodology to assess those impacts. Given the methods of standard scientific methods, I wonder why such assessments are not used in the same way in the wind farm debate. Environmental groups express concern about the concept of underwater noise impacts on animals, be it sonar, pile driving or shipping, but, when noise impact discussion is shifted to impacts on humans, the environmental movement is suddenly noticeably missing in action. I would like to take this opportunity to personally thank Senator Urquhart for her role as chair of the Senate select hearing on the Great Barrier Reef that championed underwater noise impacts from industrial processes to marine organisms on the Great Barrier Reef. Before that Senate hearing, noise did not exist. I would like to say, 'Thanks', to the senator. One chapter of seven chapters on the Great Barrier Reef report was devoted almost entirely to underwater noise. It did not exist before. Two of 26 recommendations dealt with noise. I thank the senator.

Since 1982 the UN commission for the law of the sea said input of energy into any environment or aquatic soundscape was pollution, and noise, being energy, was therefore the most basic level of legally accepted pollution. US fisheries management has recently moved from management of fish stocks from an overfishing perspective to an ecosystem approach where stocks can be depleted by fishing impacts—and habitat is very important. Noise is very important in those new regulations.

There is a general acceptance in the US and European administrations—barely, in Australia—backed up with legislation, that most acoustic energy introductions into soundscapes must be both modelled and validated. However, excessive noise failures do occur. One good example, especially in terms of renewable energy, is in New Zealand, where—and one would think this would be great for renewable energy—there was an underwater turbine. That underwater turbine made so much noise that it almost destroyed the entire stocks of pink snapper off the western side of New Zealand. That device is no longer working.

Focusing on ecosystems at least, how is it that such disparate views about the impact of noise can be generated by different sectors or communities subjected to industrial wind turbine deployments? Ostensibly, the same published data, scientific reports and medical histories are available to all, yet the perceptions differ—and it depends on who you are and on what side of the fence you are. The reality is that a certain percentage of people within an undefined radius of a turbine show signs of distress.

I will introduce some historical and current work on the impacts of noise, on marine animals, and then I will move to air equivalents. As to the playback of variable tones to dolphins: as early as 1980, the US Navy marine mammal veterinarians were playing back signals to dolphins wired for sound—with non-invasive EEGs—and looking at incoming brainstem responses to the ears. Different signals would evoke up to four times the difference of electrical energy coming into the brain. Frequency modulated and pulsing signals generated four times greater signal voltage than constant signals. We are not sure what the dolphins thought of those signals—although some marine mammal biologists would tend to think they know—but they did receive them four times more than other signals, with no humans telling them what they had heard or that they were making up the detections. This type of finding is a classic example of psychoacoustics. These signals proved to be effective for me, because I used them in a number of underwater devices that I used in fisheries.

At inter.noise 2014 in Melbourne in November, Professor Hideki Tachibana, an acoustical engineer from the University of Tokyo and a regular visitor to Australia, noted: 'Serious complaints had arisen in Japan from residents near turbines since 2000.' This was an interesting observation, clearly contradicting Simon Chapman's claims that opposition to wind farms was a recent, English-speaking phenomenon and that symptoms were spread by scaremongers. Japanese researchers working at a wind farm in Japan noted, in the work they did in 2010, that workers were complaining about low-frequency noise. Inagaki has been provided to the senators. One quote was: 'Maintaining the working environment quietly is especially important for health maintenance of the technicians who work in close proximity to the wind turbine.' Inagaki described wiring those workers physiologically to examine their responses to the sound of turbines. It is exactly comparable to the way the US Navy did for dolphins. A comparable playback experiment was conducted using a similar EEG. That paper will be published next week. The study clearly indicated that workers were exposed to playbacks of the sounds of wind turbines ranging from 300 hertz down to 20 hertz.

As to the figure for infrasound as usually described: it is an arbitrary figure—if you asked a fish what infrasound was, it would not know, because it does not mean anything. Twenty hertz is an issue related more to human hearing. And it varies all over the place. So it is not some sort of concrete item: 'That is infrasound.' It is a very variable thing. In fact, just as an aside, after spending two months at the biggest military base in the southern hemisphere, in Mogadishu, it turned out that I can actually detect—I did not want to be able to, but I can detect—infrasound at probably twice the rate of a lot of other people. But different people have different perceptions.

The study clearly indicated that workers were exposed to playbacks of the sound of wind turbines from 300 hertz to 20 hertz. The turbine units for the experiment were 600 kilowatts—tiny, compared to the three gigawatt units that we have in Australia now. The playbacks demonstrated changes to their brainwave patterns. The alpha 1 rhythm is the resting state for the brain, at eight to 12 hertz. They aid overall mental coordination, calmness, alertness, mind and body integration and learning. But at 20 hertz the test subject showed least brainwave ability to maintain a relaxed state and lower stress. For beta rhythm it shows amusing or strained state at 12 to 15 hertz. Those signals dominate our waking state of consciousness where attention is directed towards cognitive tasks and the outside world. The highest, in other words the worst mental-strain levels, were achieved at the infrasound level of 20 hertz.

Clearly exposure of subjects to the sound of these small, low-intensity and relatively higher-frequency turbines impacts their resting and strain states during the day must beg the question what effect will that have on them when they are trying to sleep at night? The significance of this study was that infrasound, traditionally regarded as inaudible to human hearing, was considered to be annoyance to test subjects. Of great relevance was that the test subjects were workers at a Japanese wind farm who would directly benefit from the wind farm. I worked for eight years for Japan fisheries and I went to that area and I would be fairly confident in saying that the test workers there have never been bombarded by English-language accounts about infrasound exposure to colour their opinion. This study clearly flies in the face of Simon Chapman's constant media assertions that wind farm effects result from scaremongering, in other words from the nocebo effect.

But why stop there? Polish researchers, I am not even going to try and pronounce the names even with one eye, published in the *Polish Journal of Veterinary Sciences*—they publish it in English—a study documenting a negative effect on Polish geese in the immediate vicinity of the wind turbine. The geese gained less weight, had a higher concentration of cortisol in the blood and demonstrated some disturbing changes in behaviour. In other words there was clear objective evidence of a physiological stress affect. This is consistent with the Japanese research which also showed that but with the Japanese it was with humans. My very good friend who I cycle with is Polish and he returns to his ancestral home on a regular basis—he can actually pronounce all the names in the paper that I have provided. He informs me that it is most unlikely that Polish geese would be sufficiently aware of English-language literature suggesting that wind turbines could be noisy. He believes the geese's response would

be pretty much indicative of their internal response to wind turbine noise—another example disproving Simon Chapman's hypothesis.

Just to move on a little, the science of cytology is the study of cells in term structure, function and chemistry. It includes the early development stages of cells in sexual cell division—meiosis—and asexual cell division—mitosis. My honours thesis was on the sexual cell division of a fish that changes sex—I have a degree of experience in this particular area as well. It is worth noting that when cell chromosomes split, replicate, divide, whichever word you want to use, and move to separate poles of a dividing cell there is a stage in one of those divisions where the chromosomes move along a delicate protein track called a spindle. Various cell perturbations including low-frequency vibrations may cause chromosomal damage. Over 2011-2012 a number of cytological studies examined the effect of low-intensity vibration on embryonic development of fish and frogs. The units of intensity of vibration were not presented but the frequency was about seven to 200 hertz. I contacted the authors because they were not very specific with the level and what I could say is that they were working with small frogs and larvae. If you can imagine a dish that was just moved slowly for a few hours, that was the experimental process. They had to keep the animals alive—there was a vibration but it was very gentle. What they determined was all the embryos showed gross malformations—something was happening at that particular time to the notochord development of the fish and frogs. It was very serious and very few of those animals would have survived even in the lab process but in the wild probably none would have survived at all.

I note from the work of Steven Cooper that the same vibration frequencies resonate in some of the homes of nearby residents at Cape Bridgewater. It is likely that animals in water around the homes examined by Mr Cooper were subjected to the same vibration damage.

Given the horrendous malformations that occurred in fish and frog embryos over a few hours in a lab situation, one immediately must consider the sudden and biologically traumatic events around the dramatically changed behaviour, mass miscarriages—up to a 1,600 over four moths—and malformations at a mink farm in Denmark, immediately after a wind turbine commenced operation. Social websites in Denmark are saying that as of now, Danish wind farms have been put on hold but unfortunately those turbines are still working. As of last night, I was informed that the malformations and the mortalities are still occurring. The government is refusing to investigate.

There is sufficient evidence over the past few decades that suggests that marine animals—prawns, rock lobster and fish—respond differentially to pulses and tones of low frequency noise, including shipping noise. Marine animals are able to differentiate anthropogenic noise from ships, from natural noise and from artificial noise. Stress impacts on fish such as blood chemistry, stress associated proteins and even immune response have been detected for as little as two hours of exposure.

Some sounds annoy more than others. As part of a 2004 national heritage trust account, I was looking at keeping dolphins away from gill nets. I was using a 10-kilohertz repeat signal—basically think of it as a truck reversing alarm, just going beep, beep, beep. A new model came and I was asked to use it by Brisbane. It turned out that that particular unit had the harmonics at 20 and 30 kilohertz removed. Every dolphin, almost, in the Gulf of Carpentaria attacked that sound source. Why? I do not know. They were very unhappy with it. And if that sound source was attached to a net, those animals died. I think the important thing was the repeat sound—some sound had a dramatic affect on these animals.

Senator LEYONHJELM: Just to clarify: that was 10 hertz?

Mr McPherson: It was 10 kilohertz. So it is a signal for dolphins.

Senator LEYONHJELM: Kilohertz?

Mr McPherson: It was 10 kilohertz. But if you bare with me, it was a modified signal. In 2011, some researchers whom I worked with examined the short-term pulse tones on seals, investigating the acoustic simulation of the startle reflex pathways that led to sensitisation of extreme avoidance behaviour. I was interested because of the dolphins. What was interesting, for this Senate hearing, was their observations involving humans—namely: 'Repeated, long-term exposure of humans to short rise-time pulse noise also may be problematic. An acoustic startle would be considered as a potentially contributing factor in the context of post-traumatic distress disorder. That paper has been provided.

CHAIR: Are you finished with your opening statement?

Mr McPherson: Yes, I can finish very shortly.

CHAIR: Keep in mind we have a teleconference call coming through at 12 today.

Mr McPherson: I would just like to conclude with one patent. Impacts of low-frequency noise on marine animals, from invertebrates to fish, turtles and marine mammals, have demonstrated that there is an adverse

impact. The world is variously developing standards to mitigate adverse impacts. The lessons from underwater noise are appropriate for use in air as with the siting of turbines. However, animals in their ecosystem deserve every right, just as Inagaki noted, 'A local resident has the right to live quietly within the limits of the environmental standards.' Yet the reason a percentage of people are impacted more than others within a given radius of turbines is still not understood. A consideration to explain the different physiological affects of infrasound on the human ear balance system is rapidly developing form a number of research areas. It is fantastic that Steven Cooper and others have provided an acoustic metric upon which to base further monitoring and experiments to establish why some people are impacted more.

What now is required is full spectrum acoustic testing inside the homes of the worst affected people, using biologically appropriate acoustic metrics, not the average metrics supported by the industry that de-emphasises the pulse signals. Detailed physiological assessment of these people using EEGs and other physiological and biomarkers for stress to see the dose of sound energy is required as a threshold to protect people from these impacts. Good, objective science will help solve this problem; bad science and industry inspired propaganda science will not.

If I falter while I am reading, I have to say that I have only got one eye, through a knife injury, and have extreme trouble reading my own writing.

CHAIR: Thank you, Mr MacPherson. How did you become interested in this field of wind turbine noise, which is quite removed from your expertise in underwater acoustics?

Mr McPherson: Perhaps it would have been nice to think that we were moving in parallel areas. I was working in underwater noise and I saw people I knew working in air, and then I saw mass inconsistencies occurring. Certainly it is not easy underwater. There are a number of organisations that do not want you to talk about that. We are moving forward. The shipping agencies, for instance, have established through the International Maritime Organization ways to mitigate the noise—we are all moving forward. Then I look at what is happening in underwater noise, and what I see, as I noted in my submission to the Australian Medical Association, is that more information is being rejected than is being accepted, and it is deliberately being done simply by changing the keywords.

Senator DAY: Do you mean in air noise? You said underwater.

Mr McPherson: In air, with the Australian Medical Association and the National Health and Medical Research Council review, it took about three seconds to realise that that review was written, given the way they wrote the keywords, to not find anything. Unfortunately, that is science; we are like that and that was just a good example of that.

Senator CANAVAN: Can you specifically give us—

Mr McPherson: I have given a list in my submission. I can read it out, though.

Senator CANAVAN: No, that is okay; if it is in your submission, we can find it. I am interested because we have the NHMRC appearing.

Mr McPherson: It is only a few lines. I could read it very easily, if that would help. The listing of the keywords shows that it is chalk and cheese.

Senator DAY: In a previous submission, a farmer noted an increase in miscarriages and deformities of newborn lambs since wind turbines became operational near his farm. Another submission referred to the unexplained death of a family dog in great suffering shortly after a wind turbine became operational. As a scientist, what is your view of the correlation, given your evidence this morning and these other examples?

Mr McPherson: Certainly, I think a vet or a cytologist would be the most appropriate person to investigate that. I am more than familiar with vibration being an issue, and I think there is a significant amount of information to suggest that vibration at certain stages of life cycles of animals can cause a problem. I am aware of that particular situation, but I cannot comment; I have no data.

Senator DAY: We do have two vets on our committee.

Mr McPherson: That is why I thought I would leave it to them.

Senator LEYONHJELM: It is interesting that you thought that 20 hertz is where the trouble lies.

Mr McPherson: In the Japanese work, it was an equipment failure. The work from Steven Cooper and from the US on Shirley wind farm, as an example, was all published by the Acoustical Society of America, which I have been a member of for a number of years, and I have been a member of the bioacoustics panel. They certainly go lower than that.

Senator LEYONHJELM: That is where I was heading. Steven Cooper's argument is that the worst affects, if I can put it that way, are in the range of zero to 20—so below 20—and there is also a measurement problem. He describes it as narrow-band measurement. Is your experience in marine acoustics relevant to this measurement issue?

Mr McPherson: The same measurement occurs. The techniques are there. Steven Cooper's equipment, as I understand it, is perfect. The nearest comparison might be measuring for seismic impact, where you are looking at the same sorts of frequencies. The equipment is available for measuring acoustics well below 10 hertz, as in air. In fact, I think it is probably better in water.

Senator LEYONHJELM: There is no technical reason why a condition of approval of a wind farm could not require the wind farm, or an independent monitor, to monitor its emissions of sound in the range of zero to 20 hertz?

Mr McPherson: That is correct. The techniques are available. I think the work of Steven Cooper has shown that, so now those measurements can be correlated to the observed health effects that people are reporting. That is what we have been waiting for for a long time.

Senator LEYONHJELM: Is that equipment widely available? Is it particularly expensive, unusual to set up or learn how to use?

Mr McPherson: Not really. It is expensive. Quality—you always pay for what you get. I will have to say that in acoustics there is a lot of junk and a lot of words used to explain why that junk is okay, but I think you pay for what you get. That equipment is available. The expertise is available, particularly in southern Australia. I do not think you should be looking too closely within Queensland for that—I can say that as a Queenslander. I know they were not interested in hearing anything about underwater noise and low frequency, because so many people put in applications to the recent review by the Queensland government and they were ignored just like Ms Pagani was noticing for her work.

Senator LEYONHJELM: What can you tell us, from your marine acoustics experience, about what adverse effects the very low-frequency—zero to 20 hertz range—sound has underwater?

Mr McPherson: Most of the effects that we are seeing so far involve vibration or masking of communication. We do have a lot of cellular work that we are looking at that causes concern, but at the moment most of my direct experience relates to low-frequency masking signals between animals and perhaps even behavioural change. Italian workers are probably leading the world in that by replaying signals and looking at cortisol changes. It is hard, because fish consider a signal at one to five hertz as being normal communication. They do not see it as infrasound or whatever. That is all part of normal communication. It is a hard one, but certainly behavioural impacts have occurred.

The best example that I can think of was the seismic survey conducted in the Great Australian Bight that terminated an entire year's migration of juvenile southern bluefin tuna. It was probably one of the worst things we have ever seen. It was masked, if you like, but the commercial fishing industry, with the backup from a number of environmental NGOs, have declared the seismic survey as being a key threatening process.

Senator LEYONHJELM: What frequencies are involved in those seismic surveys?

Mr McPherson: From about less than a hertz up to about 20, 30 hertz—even going as far as 20 kilohertz.

Senator LEYONHJELM: Then the range that Steven Cooper is saying is the causative range for adverse effects on wind turbines. You said the Italians are looking at cortisol. Is there any physiological link between these low-frequency sounds and survey data? I am talking about non-behavioural stuff, physiological data.

Mr McPherson: I can think of about three situations where larval fish were subjected to very low-frequency signals for a matter of minutes every day for two or three days and their cortisol levels changed. One of the reasons that their levels changed was that their otoliths—the hearing mechanisms—were unbalanced. The fish that had unbalanced hearing organisms were badly stressed. I think that the otolith issue could well be part of the infrasound impact in humans. That is published as well.

Senator LEYONHJELM: Is there a dose-response relationship and does it apply equally to all the fish?

Mr McPherson: That would be a hard one, because we are looking at several families of fish so far and each family has a different habit. Each of those habits might place them in exposure to low-frequency sounds at a different rate. I would have to check on whether there was a dose response; I think there would be. There would be half a dozen references for that. But it sure looks like there is one. As the work of Steven Cooper has demonstrated, with appropriate assessment, whether that be wiring for sound, proper physiological work, I think you would find the answer you want for wind farms.

Senator LEYONHJELM: You would expect a dose response—in other words, the more intense and louder the sound, the greater the effect. But he also argues that there might be a cumulative effect. I used to be a veterinarian, so I was struggling with that. I said, 'Is that a bit like radiation?' You can accumulate an effect from radiation over time. He suspects that that might be the case. I cannot work out how sound could do that. Can you?

Mr McPherson: Yes.

Senator LEYONHJELM: Can you explain it to the committee?

Mr McPherson: I think it is a stress factor. The noise generates the stress and the cortisol levels build up.

Senator LEYONHJELM: So it is a cumulative stress effect, not sort of a stored problem?

Mr McPherson: One of the problems that I think exists at the moment in terms of cumulative is what sort of impact the noise pollution is going to have at a population level. Certainly, there is no shortage of tank tests and sometimes limited assessment in the wild. But, say, with fisheries, which we have to work with, to have an understanding of whether that fish stock is being impacted by noise at a population level—that is where we are struggling.

Senator LEYONHJELM: Okay. I will leave it there.

Senator BACK: Mr McPherson, have you had an opportunity to examine the couple of literature reviews undertaken by NHMRC upon which many local councils and in fact state planning departments rely?

Mr McPherson: I did look at it, more from a scientific point of view, as a scientist—and anyone who follows the scientific method is a scientist; I think I should say that. In my assessment of what I saw, and as I wrote to the Australian Medical Association, I documented how they picked their keywords, listed those keywords and basically how those keywords generated 3,000 articles. I pointed out that if they had used more appropriate keywords they would have got about 10 times the amount. For instance, the keywords that were not used in that review—I can list them here; it seems incredible that they leave these out—were stress; annoyance; heart, with qualifiers; disease; misophonia, which is a selective sound sensitivity syndrome; psychoacoustics; headaches; nausea; dizziness; sleep disturbance. All those factors were not in the tabled list of keywords. You would tend to think they should have been.

Senator BACK: You are saying that they were not keywords used in their searches?

Mr McPherson: That is correct. The other thing is that they only used English. If they used Dutch, German, Swedish, Danish, Polish, Japanese or Korean—the abstract is often in English, sometimes the entire journal is in English; it might be Korean—that would find a lot more detail. But all that was left out. Basically, if they did not want to find it, that was the way to not find something.

Senator BACK: So would that be your summary—that, if you set out to not find out, you do not find out and then afterwards you can say so?

Mr McPherson: Yes. I do not think it is a novel concept.

Senator BACK: Thank you, Mr McPherson.

Senator CANAVAN: Mr McPherson, how would you sum up the current state of scientific knowledge of the infrasound generated by wind turbines and its impact on human beings?

Mr McPherson: I am trying to think of the word that would mean 'squashed'. It would be good, I think, if the communications industry provided equal publicity to all sides of the argument. That is not occurring. I said that about the *Cairns Post* recently, and they have changed. There are various media organisations that just will not give a balanced view on underwater knowledge to let people assess what is going on. But I think that while the science is going on, from many, many disciplines that are meeting together and that can be utilised by people to finish it off and develop a bigger picture, all that science is being lampooned—the Simon Chapman nocebo hypothesis: 'people are making this up; don't listen to the science'.

CHAIR: Thank you for your appearance here today.

THORNE, Dr Robert, Private capacity

[12:16]

Evidence was taken via teleconference—

CHAIR: Welcome. Could you please confirm that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Dr Thorne: Yes, thank you.

CHAIR: The committee has your submission. I now invite you to make a brief opening statement, and at the conclusion of your remarks I will invite members of the committee to put questions to you.

Dr Thorne: In brief, I have three major comments. The first is on the Clean Energy Regulator. I have made a point, I believe, that in my view the regulator has not been meeting what I believe is its duty of care to ensure that the planning provisions that are mandatory have been observed for wind farms. The second point is that the conditions themselves that have been imposed on different wind farms are [inaudible] to actually measure indices. And the third point is that the National Health and Medical Research Council has not, in my view, really addressed the issue of adverse health effects and has failed to take into account the very real concerns of people who believe they have been affected by wind turbine noise. That is my opening address.

CHAIR: Your primary submission criticises the Clean Energy Regulator for lack of duty of care, and your supplementary submission requests that this committee identifies the moneys paid to wind farm operators. Are these two issues linked?

Dr Thorne: Yes, they are.

CHAIR: In your opinion, would the regulator be able to undertake this type of audit?

Dr Thorne: I believe so. I believe from the information I have had from the regulator that it is more that there is no specific direction that the regulator should actually investigate the compliance with planning approvals. And, to be fair to the regulator, that is also a very difficult call. It requires a lot of technical information as well as, I would guess, quite a long-term approval process. So, even though my comment is that they have not met their duty of care, I believe they could have, should have and can.

CHAIR: Are you aware of the research by Mr Steven Cooper and Pacific Hydro?

Dr Thorne: I have followed it with intense interest.

CHAIR: Do you believe the research by Mr Cooper and Pacific Hydro can be repeated at other wind farms?

Dr Thorne: Yes, it can. The work by Mr Cooper and by Pacific Hydro is benchmark work. I say that because Mr Cooper was able to find physical tests and link them to human perception that no-one else has been able to do before. That has been because of the assistance from Pacific Hydro. The work can be repeated very easily by other consultants, whether they are with a wind farm activity or whether they are from a compliance regulator or just ordinary people doing crosschecks.

CHAIR: I note that you have made some strong criticisms of the quality of work done by the National Health and Medical Research Council. Could you briefly summarise some of those concerns for the committee?

Dr Thorne: When they investigated and read 4,000 documents and, I think, in the end they came up with 13 that met their criteria, something is wrong. Earlier—I think it was in 2011-13—Professor Anderson of the NHMRC came and made the very valid point that anecdotal information—that is, residents' submissions and their viewpoints—was valuable in identifying issues, not necessarily cause and effect, but identifying the start point. But, whenever we look at any research, we go for observations, then trying to get an idea of what is happening, then work the hypotheses and then studies. It was obvious—and I have got quite a lot of research myself in the past—that there are very few adverse health effects studies undertaken, primarily because there has been no funding for adverse health effects studies. You cannot get a study if you do not pay for it, and you cannot get an impartial university-based study unless you pay a lot for it. That is my view. The NHMRC were well aware that there was nothing out in the wild. I had appeared at the hearings in 2012 and had made comments since then. It is disappointing. I feel that they must have spent a lot of money to achieve very little.

CHAIR: Is the point you are making that, in recent years, we have had many people in the community adjacent to wind farms claiming that they are affected by the wind farms and that there has been very little money, if any, allocated to investigating these people's claims?

Dr Thorne: Yes. I believe so. I would stand out, of course, with the South Australian EPA, who did a really good study. They were not looking for adverse health effects but, because of the depth of their study and the information that they drew down from that, people like me were able to review and find good, solid information

about adverse health effects—or adverse effects; I should say not health effects but adverse effects. Most of the studies that I am aware of, even overseas, have been quite limited in what they can do, in that—if I could go back your comment on Mr Cooper's study—they were not supported by the wind farm operator itself. By that I mean: if you cannot turn off the turbines and get a crosscheck as to what is happening, then you really do not have any detail base to work from. There has been quite a lot of observational studies, case studies, of adverse health effects from wind farms affecting people from operational wind farms but not with them turned off. That is the state at the moment, and I would say Mr Cooper and Pacific Hydro have one of the very best studies available at this time.

Senator DAY: Dr Thorne, on page 86 of your submission, you duplicate a letter that you wrote to the Clean Energy Regulator on 2 March this year asking if wind farm operators were required to provide 'continuous confirmation that their power stations are complying with planning conditions'. Have you received a response yet to your letter?

Dr Thorne: I have and I sent an email to the committee apologising for not forwarding it earlier. It was from one of the regulators, and they simply advised that the applicants to the scheme required to have relevant approvals and permits in place before they are accredited. They are required to confirm that they are compliant with approvals and permits.

Senator DAY: But that is all you have received—just that perfunctory response?

Senator CANAVAN: Did you want to add something there, Dr Thorne?

Dr Thorne: Further to this, they are required to confirm compliance when creating LGCs and annual electricity generation returns. I sent that through as an email to the committee about a week ago.

Senator CANAVAN: I have got that in front of the me, Dr Thorne. I felt a bit vague. Have you taken from that they need to confirm their continuing compliance with approval requirements every year?

Dr Thorne: Yes, I believe so. I honestly do not know that the structures they have in place for the funding are, but, if you are getting money, then you need to confirm on a continuing basis that you are entitled to that money.

Senator CANAVAN: Have you asked—and we will do this of course—the department what lengths they go to to ensure that the statements saying they are complying stack up?

Dr Thorne: No, I have not done that.

Senator CANAVAN: That is okay, we can do that. Chair, I have a different line of questioning but I am happy to cede to other senators.

Senator BACK: It is interesting the comment you make about the Clean Energy Regulator. I think we have exhaustively asked her questions in Senate estimates about the very issue that you are referring to. You might be interested to know that the regulator in fact makes it very clear in those answers in Senate estimates that the role of the Clean Energy Regulator in her view is not to act as an auditor but more to be satisfied on the economic regulatory side in the sense that she just is satisfied that the power generated is correct and it is upon those figures that the renewable energy certificates are paid. The Clean Energy Regulator relies on the operators to give accurate figures in terms of their compliance and the state authorities to give accurate details of their compliance. Is that something that you are aware of or is it something that surprises you that the Clean Energy Regulator believes that is the role to be?

Dr Thorne: I am surprised that they take that stance. The regulation seems to be quite plain that they have to have the planning approvals in place. You cannot, in my mind as an old government administrator, say to somebody that you comply two years down the track, or five years down the track or 10 years down the track on the basis of your very first approval. That simply does not make sense.

Senator BACK: That is the line of questions that have been run. But I make that point, because it also surprised me and others. Given time constraints, could you briefly summarise your findings from the Cape Bridgewater-Waubra studies, which you have submitted to a previous Senate inquiry. If I recall correctly, that data that you provided was in fact new data, and I would be particularly interested in your summary of any impacts on residents.

Dr Thorne: It was what is called a case study. In that case we used people who we knew are affected because we wanted to know how and to what degree they are affected by noise. There is a set of standard tests that is done for adverse health effects, sleep disturbance, annoyance and a few other environmental measures. They are then tested against predicted levels and measured levels while the turbines are operating. I could find that people are affected, and from my original research back in New Zealand in 2006-2007 we knew people were being affected, but we did not know by what and how to measure it.

The work that I did gave me quite a few answers, or methods of measurement, more importantly. Then the work by Mr Cooper and Pac Hydro filled in a lot of gaps for me. For example, Mr Cooper found different frequencies down in the infrasound range that I was not able to test, because I simply did not have the equipment at that time. Because of all the information he published, we were then able to look at that and work out—I should not say 'work out'. We had always been thinking that it was a nauseogenic reaction—that is, like seasickness or motion sickness—that was causing some problems. They work in about the 0.2 to 0.5 hertz range and then in four to seven hertz. I could measure the four to seven but I could not measure the very low frequencies. With his research plus mine in the past, plus work being done overseas at Shirley wind farm and a few others, I believe we have now got a really good basis for working out what is happening with wind turbine noise and infrasound issues.

Senator BACK: I will ask you to hold it there, if you would, because we are a bit short of time and I want to pass to others. Those effects that I think have been defined rather loosely in some circumstances as annoyance: headaches, nausea et cetera—in your experience as an acoustician, have they also been evident from other sources of industrial noise?

Dr Thorne: Yes, it is very common.

Senator BACK: So it is not something that is unique to this?

Dr Thorne: No. Low-frequency noise from large fans is a well-known and well-published issue, and wind turbines are simply large fans on top of a big pole; no more, no less. They have the same sort of physical characteristics; it is just that they have some fairly unique characteristics as well. But annoyance from low-frequency sound especially is very well known.

Senator BACK: Finally, the term used in some circles to describe all this is this nocebo effect—the opposite of placebo effect. With the work that you have done over time, do you support or not support that notion of a nocebo effect in relation to the clinical signs or the symptoms or the annoyances, if you want to use that term, that people are reporting?

Dr Thorne: No, a nocebo effect cannot exist with noise and sound. Nocebo is an effect that has no physical basis, no physical characteristics, that generates the effect itself. Sound and noise have a physical effect and they can be measured. Mr Cooper has measured the infrasound, and I have measured the audible sound. Nocebos simply do not work—otherwise there would be no need for acoustic consultants, and that may be a good thing, but you cannot have it both ways. Noise exists, sound exists and sound and noise are physical and a perception.

Senator LEYONHJELM: Dr Thorne, I found your submission very interesting. Some of the questions I was going to ask have been asked already, so I am going to go to an issue that you discuss in points 13 and 14 in your submission. You talk about:

... increased sound levels due to synchronicity effects of turbines in phase due to turbine placement and wind direction ...

Then, in point 14, you talk about the:

... sound created by each individual turbine and the cumulative effects of a number of turbines.

This is new information for the committee, as far as I am aware. Could you take us through what you know about it.

Dr Thorne: Ordinarily, turbines are not operating in sync. This is because of power requirements and the general efficiency of a turbine, and that has been well explained by Mr Cooper in his report with Pacific Hydro. The problem though is that when you look at four or five turbines in a line, even if the turbines are not operating at the same rotational speed, they often line up so they have two blades in sync, operating at the same time. At this point, we get what I have measured and observed as a thump-thump sound. It is quite a unique sound effect that can be measured. This is one of the sound effects that really annoys people.

The other effect is that it only lasts for a short while and then it disappears. This is one of the things of critical importance in what is called special audible characteristics, or impulsiveness or tonality, inside a wind farm. Noise measurements will only measure a crude dB(A) number, not a very useful number at all. It is like saying you are driving 100 miles an hour when actually you are going through towns, speeding up and slowing down.

The effects of the turbines when they are in sync will last for, say, 60 seconds. People are then awake if this happens at night, and the turbine sound goes. If you come back in another half hour, the turbines may be back in sync again. There have been quite a few papers written on this and a doctoral thesis on it by van den Berg. The effects are very well known and were widely published. To mitigate the noise though is really quite complex and, without taking up your time, there is a thesis that describes how it has to be done—or may be done.

In Waubra, I could walk a distance of about 65 metres and hear the turbines in sync from two different wind farms from about 2,000 metres distance. Sixty-five metres further on, the turbines disappeared from one location and then reappeared for a another location. That is how critical it is. Then, when the wind changes, the sound shifts. Part of my critique of noise standards and conditions that I have quoted here and are in my supplement is that these conditions do not reflect reality. The conditions are too broadband to reflect it. The conditions in Victoria are good if they are imposed properly, because they have special audible characteristics that have to be measured, but to do that you have to be physically at the wind farm at the time and recording the sound you hear, and that is what I have had to do when I have done my research. You cannot just go for 10 minutes and say, 'Hey, yep, got it,' and be gone. The conditions themselves last all night and have to be measured all night or for 24 hours or in the case of Mount Emerald, to my mind, forever—30 years.

Clearly a lot more thought has to be gone into in creating proper conditions to be fair to both parties—that is, the wind farm operator and the people near a wind farm. Synchronicity is just one of those things. We thought many years ago that it was going to be the magic bullet—that we could say to the operators, 'Look, shift that one out of sync by five degrees or a few minutes or a few seconds in operation.' It clearly is not that easy, and Cape Bridgewater has shown that our original ideas are probably just too broad scale to be effective.

Senator LEYONHJELM: That is interesting. You have just answered my next question as well. On point 21 of your submission, you said:

Simple instrumentation currently used for wind farm noise compliance is not able to discriminate between different sound characteristics and determine whether they are wind turbine noise or other noises. Nor can a sound level meter determine if a change in sound level is due to a change in wind speed.

We have heard from a previous witness that normal sound instrumentation is actually not capable of measuring the kind of sound that Steven Cooper found correlated with perceptions at Cape Bridgewater. Can you take us through what would be required, from a regulatory perspective, to define the kind of instrumentational sound measurement that would be required in order to detect very low-frequency sound.

Dr Thorne: What we put into place some years ago for a couple of wind farms, or for discussion, was that the sound be measured by audio file—so that was always kept so we could determine if there were audible characteristics—and by narrowband analysis, which simply means that the sound is chopped up into very fine chunks. Some of those chunks will identify blade pass. Some of them will identify the unique type of noise from a specific type of turbine. Mr Cooper has found 31 hertz for his study—broadly, 32 to 35. In my studies, I have found 27 to 28 was more common. We can then say, 'Right, that sound that we're measuring is from a turbine,' but where it all fails is where you have an overall measure of dB(A) level. That brings in all the noise from frogs and insects at night, passing traffic, trucks and people talking too close to microphones. It means that, if you do not have this unique identifier or signature analysis and the audible characteristics that uniquely identify the turbines, you are not able to say that the sound level at that home was due to a wind turbine. It could be due to anything if you only have broad-scale numbers.

There has been quite a lot of software that does this type of analysis, and the algorithms for creating the templates are reasonably straightforward. We did this many years ago, but it never enjoyed any great enthusiasm from other acousticians, I might say, because it requires quite a lot of work and you have to go and actually analyse the wind farm beforehand, or the locality, and, over 12 months or so, get a very good feel for what is happening and then superimpose the activity of the wind farm on top of that. But, again, I felt that that was not a big issue. Wind farm operators tend to measure the wind at their wind tower for 12 months, 18 months and two years. They can measure sound at the same locations or within the environment for the same length of time. It is not a very expensive operation; it is just quite picky when it comes to doing the algorithms. As I think Mr Cooper might have said, it took him a lot of time to create this templates, but once the templates are created of course it is relatively straightforward for people like me and others to pick up on that and to redevelop them further.

Special audible characteristics can be measured, tonality can be measured—impulsiveness, the different types of turbines and the different location within the wind farm can all be measured.

Senator LEYONHJELM: I am still trying to understand what all this means. Are you suggesting that each wind farm has a perhaps unique signature which is the actual frequency of infrasound, that that has to be identified and that is what has to be monitored in terms of potential to cause adverse health effects?

Dr Thorne: I do. I believe that now, after quite a long time—quite a few years of wandering around wind farms. It is the hard choice but it is the only choice, I believe.

Senator LEYONHJELM: The signature for each wind farm will be different—is that right?

Dr Thorne: A lot of debate is needed on that yet. Most of us have only done audible sound. With Steve's work and the instrumentation he has described, a lot of other people are now working and identifying the unique character of wind turbines and their very low frequencies. So, no, we are still in early days yet with that type of research.

Senator DAY: Dr Thorne, in your submission you question the impartiality of the NHMRC in investigating the health impacts. What institutions would you recommend be included in further research into this area?

Dr Thorne: I honestly do not know. You do need a university, I believe, to do this sort of work. I questioned the impartiality because of how the questions were originally asked and how I am sure the contract was originally let. If you state that you want a study with an extremely high benchmark then you cut out everything else that is of use and of value that supports that very high benchmark. That is why I agreed with Professor Anderson that his anecdotal observations were critical. It is not so much the organisation that does the study, or organisations, but the way the wording of the study is actually framed.

Senator DAY: It sounds like a quote from Stalin, 'It doesn't matter how many votes you get; it's who counts them that matters.' Are you suggesting it is more about the research than the actual institution itself? What about overseas institutions? Do you have any views or recommendations in the area?

Dr Thorne: No. We know quite a few of our colleagues and any one of them would die to do a proper research study. Research is, by and large, researchers: they just love going for whatever the topic happens to be. So the umbrella organisation that it sits under is not so important as the actual quality of the people you get; and their expertise and their ability to talk with each other. You have to have people on that committee who have different points of view, but held in check by a strong chairperson who moderates and brings the best of the study. That, in my view, that did not happen with the NHMRC.

Senator DAY: You may have followed the case in Western Australia where the University of Western Australia has declined Bjorn Lomborg's consensus institution because it does not sit comfortably with some of the researchers that are already there, so I guess I understand where you are coming from on that. Can we leave it open to you that, if you do have a view on that, you could let the committee know?

Dr Thorne: Yes.

Senator CANAVAN: Can I just follow up on Senator Day's questioning. An industry that has faced, I suppose, similar uncertainty about its impacts has been the coal seam gas industry in the last few years. The federal government around three, maybe four, years ago established an independent expert panel on coal seam gas and large coalmining to look into the impacts on groundwater, largely, of these projects. Is that a model that we could look to potentially, where we do not necessarily have an agency in charge right now, but we could create a panel of experts to look at these things? In the coal seam gas case, the government has allocated \$150 million for that research. Do you feel there are enough experts around the country to be able to form a panel of that kind?

Dr Thorne: Yes, there are. With coal seam gas, Queensland has, I think, a very good basic development approval that acts as a baseline. Queensland also talks about wellbeing in their noise policy—sleep disturbance and wellbeing. These are the critical things, and you do not need to have a huge and intricate study proposal. It is essentially: (a) you have to be fair to both parties and (b) you have to know what the heck you are talking about when you ask the questions or set the parameters. Ideally you are simply saying you cannot have all these people making submissions to your Senate committee that say they are affected by turbines and then leave them with nowhere to turn.

Likewise, I am sure the industry has countervailing points of view. You do need to have good people on both sides who can sit down. That is initially why I was so pleased to see the work with Pacific Hydro and Mr Cooper, even though it may have become a little bit more awkward towards the final report. But the work that they produced, even though they may not always have seen eye to eye, is absolutely groundbreaking. I must give credit to both parties for that.

Senator CANAVAN: The way the independent panel works for coal seam gas is that every coal seam gas project has to go through a process, and a report is provided by the panel. Obviously it is an advisory report. The minister makes the final decision. Given your evidence earlier to Senator Leyonhjelm, if something like this were established, would it need to look at each individual wind turbine project, given that you seem to suggest that every project is different?

Dr Thorne: You can get quite a few that are very similar in effect. That is what we have done in the past. We look at rows of turbines, banks of turbines, clusters of turbines and different types of turbines to see what the different effects are, and there are different effects with different turbines. It is a manageable type of project, because the core queries are very much the same from one place to another.

Senator CANAVAN: I think in your submission you noted that the NHMRC have put aside \$500,000 for further investigations and you are suggesting that is far too small, from my recollection. What do you think? You do not need to give me a precise number, but what sort of ballpark would we need here?

Dr Thorne: I compared it to the Canadian study that has been published in part and will be out. This is Health Canada. They have spent now Can\$2.2 million for 2,000 people in the responses. If we look to the thousand, I thought about 1.2. I know roughly how much Mr Cooper spent. I know how much we have spent over the years on our studies. So I am afraid \$500,000 would not get you a high-quality study. It would barely scratch the surface.

Senator CANAVAN: Just to clarify: the funding you are suggesting would be for actual real-world testing, not a desktop review, a literature review or anything like that?

Dr Thorne: Yes, real world. We have gone well past desktop now. There is enough information out there. It is collating it, putting it together. No; it has to be real-world and it has to work with the cooperation of the different wind farm operators—which could be difficult, but that is fine.

Senator CANAVAN: Have had a look yourself at the Mount Emerald wind project? My questions go both to the conditions that have been placed on that and the process that the Queensland government has gone through in terms of seeking advice on the project. Do you have any knowledge of that at all?

Dr Thorne: Yes. I did original study on Mount Emerald and have done an analysis and background sound levels up there and have done calculations of noise levels and compared with my colleagues' reports. I have seen the conditions. I have them in my supplement. They cannot be enforced. They are impractical. They are ambiguous. In basis, they are unreasonable, both to the wind farm operator, because it does not say how long this has to work for, and the residents, because there is no complaints process. So, apart from the fact you cannot measure whatever it is that they ask for, best practice is being claimed. It is certainly not best practice.

Senator CANAVAN: Could you briefly—we only have a few minutes left—highlight the areas you think are not best practice or cannot be complied with?

Dr Thorne: I have put that in my submission. Under 'acoustic amenity', wind farms must be designed and operated to ensure that—then it has got a long lot of criteria there. But is it the noise from the wind turbines that we are measuring or the noise from the wind turbines and the associated noise in the environment that we are measuring? At that point it is ambiguous. If it is ambiguous, it is uncertain. If it is uncertain, it is unenforceable. If it is unenforceable, it is unreasonable.

Senator CANAVAN: I do not think I have looked at that second supplementary submission you put in, so, in the interests of time, I will do that. Did the Queensland government—given you previously had worked up there and done some testing—ask for your advice on this particular project?

Dr Thorne: No. I doubt if they even know I exist.

Senator CANAVAN: Who did you do that work for then? Why were you doing that previous work at Mount Emerald?

Dr Thorne: The work was done for the council.

CHAIR: Thank you, Dr Thorne, for your appearance before the committee today. There being no further questions, we will now suspend for lunch.

Dr Thorne: Thank you.

Proceedings suspended from 12:58 to 13:57

FORBES, Mr Vivian Richard, Chairman, Carbon Sense Coalition

WALKDEN, Mr Colin William, Private capacity

Evidence from Mr Forbes taken via teleconference—

CHAIR: Welcome. I note that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. The committee has your submissions and I now invite you both to make a brief opening statement and, at the conclusion of your remarks, I would invite members of the committee to put questions to you. Mr Forbes, would you like to go first?

Mr Forbes: Thank you. My first point is this: The Carbon Sense Coalition is not opposed to wind power. Wind power obviously has applications in some remote locations and other special circumstances. We do believe that consumers should be free to use it whenever they see benefits; however, governments should not attempt to force feed the growth of wind power or to hobble other energy sources. Therefore what follows from that main

point is that there should be no renewable energy targets or carbon taxes. We oppose specialist subsidies or tax breaks for wind power, we oppose exemptions for wind power from general environmental regulations, we oppose higher prices for electricity produced by wind power and we are opposed to forcing electricity retailers or consumers to bear the extra costs of wind power. That is our main point.

My second point is this: we believe wind power has little benefits for Australian cities, industries, consumers, the environment or the climate. There is nothing new about wind power, so we are not going to get a technological breakthrough. Wind may be free, but it is very expensive to generate reliable and continuous power from it. That is in fact its biggest disadvantage, which will never be solved. Wind power is intermittent, therefore it needs backup power to deliver any sort of continuous power. This backup power then has to operate intermittently also. It is like a disease: wind power operates intermittently; therefore, the backup has to operate intermittently; and, therefore, the capital costs are doubled and the operating costs are vastly increased because of all these semi-idle men and materials just waiting for the wind to go or stop. As the proportion of wind power in a system increases, it increases the chance of grid failure, resulting in load-shedding and blackouts at times of high demand—and we are going to see examples of that in Europe soon.

The other problem with wind is that it is very diluted, so large areas of land are required to collect significant energy, and this can never be changed. There is nothing we can do about the fact that air has a certain volume, and wind travels at a certain speed. That determines how much energy is there. Therefore, because it is so diluted, we need a big area of land for access roads, power sites and transmission towers, resulting in much environmental disturbance.

The main reason people promote wind power, apart from the promoters who are after money, is that it reduces carbon dioxide emissions. No-one has proved this and there is considerable doubt that there is any reduction in carbon dioxide emissions by using wind power. Even if it did manage some minor reduction in carbon dioxide emissions, there is no proof that this would have any noticeable or any beneficial effect on the climate. That is just a mirage.

Wind towers are universally hated by their neighbours, who are annoyed by the noise, the flicker, the fire risk, the traffic, the power lines, and the birds and bats killed by the whirling blades.

Finally, why does anyone promote wind power? Apart from the promoters seeking profits, as I said, the extreme environmentalists promote wind power because they understand it very clearly: they know that wide adoption of wind power will destroy industrial society. No-one can run smelters, refineries, electric trains, hospitals or continuous manufacturing on high-cost, intermittent power such as wind.

In summary, there should be no special support; wind power is costly and unreliable; and there are no net benefits. I am happy to answer any questions or to discuss it further.

CHAIR: Thank you, Mr Forbes. Mr Walkden?

Mr Walkden: Thank you for taking the time to come to Far North Queensland to hear from residents. My life changed for the worse when the turbines started operating at Windy Hill Wind Farm. The closest turbine is about 450 metres from my home. Within two months of the turbine starting, I knew I had a serious problem and I contacted a solicitor. I have sought help at various times from the council, the EPA, Queensland Health, Stanwell Corporation, the health ministers, my local member and RATCH, the current operator of Windy Hill. There is still no relief from the turbine noise, which I have tolerated for nearly 15 years.

Finally, after a noise complaint to Stanwell Corporation, my request to have the wind farm monitored was granted. After the monitoring, at a subsequent visit by representatives of Stanwell I demanded to know if I had a noise problem. They agreed that I did have a noise problem. One of them offered to insulate my roof as a show of their good faith. It was agreed that Stanwell would organise and pay for the work, which they said would cost about \$4,000. They said that, upon completion, if this was not successful, further mitigation would be considered, such as waterfalls, new stereo system, air conditioning, double glazing of my doors and windows. It turned out that they were just dotting their I's and crossing their T's in preparation for their sale of the project to Transfield in late 2007. My repeated requests for a copy of their noise report were refused.

The sound coming from the turbines changed from moment to moment. The thumping noise from the turbines is worse at night, especially when it would normally be quiet at my property. The noise seems to come through my pillow and it gets into my head and I cannot get rid of it. It takes a long time to go back to sleep. Less turbine maintenance has taken place in the last two years and the bearings are getting noisier. It is a metal-on-metal grinding noise. I guess the turbines are getting old and are too costly for RATCH to maintain. In 2012 my GP referred me to a psychologist. I would prefer not to go into detail here, except to say that my psychologist says my general wellbeing and capacity to function in daily life are being significantly reduced by exposure to turbine

noise. He expects that these conditions will persist as long as the noise stressor—that is the wind turbines—continues. I feel I have lost part of my life, my common law rights have been violated and I have been denied the right to enjoy the peace and tranquillity of my rural property. I have been forced to give up my home-based nursery business because I can no longer cope.

Is the Windy Hill wind farm complying with its noise permit? I do not know. All I know is that the noise is at times overwhelming and at times is audible in every room of my home. I have no problem sleeping when I am away from home. I waited for nearly two years whilst the council tried to get RATCH to comply with the noise models required by its permit. Council received a report from Dr Thorne that the wind farm was non-compliant and that some turbines should be shut down. Why didn't it happen? His report was not discredited. All the noise experts identified the amplitude modulation—that is the thumping noise of the turbines. There is something very wrong when amplitude modulation is not taken into account. These technicalities do not help me. The current laws are not strict enough and are impossible to enforce. I do not want the same to happen to the residents near the Mount Emerald project. A bad decision by a developer or a government department does not affect their lives, but residents must live with that decision for the rest of their lives. Thank you.

Loud applause—

Senator LEYONHJELM: First of all, Mr Walkden, can you remind me of the power of the turbines in the Windy Hill farm.

Mr Walkden: I think it is 0.6.

Senator LEYONHJELM: Relatively low, comparatively.

Mr Walkden: Yes.

Senator LEYONHJELM: Without spending a lot of time, and I do not want to upset you, but can you describe how the adverse effects that you felt developed: how did you first notice that there was a problem, what was it like and what were your thoughts at the time?

Mr Walkden: In the beginning they were very, very loud. I was disturbed right throughout the day and it was worse at night. That kept going day after day after day, as long as the wind was blowing. Probably after about a couple of months I realised something was wrong. As I said, I had contacted my solicitor and filed a complaint with the Herberton Shire Council, and nothing happened about it.

Senator LEYONHJELM: What I am interested in is the symptoms you felt rather than what you did. You described having something coming through your pillow. Could you expand on exactly what it is you feel and what is the adverse effect on you?

Mr Walkden: That particular episode makes it very difficult to go back to sleep.

Senator LEYONHJELM: You wake up?

Mr Walkden: Yes, I wake up. I have taken to going to bed quite late at night hoping I am going to be tired enough to go to sleep. I always wake up around about one o'clock, and it is usually up to four o'clock before I can get back to sleep again because that noise is constantly there.

Senator LEYONHJELM: Is it every night or just intermittent?

Mr Walkden: Just when the wind is blowing bad.

Senator LEYONHJELM: Does it make any difference which way the wind is blowing?

Mr Walkden: Most of my wind comes from the south-east. If it comes from the west I do not hear it at all.

Senator LEYONHJELM: Some people we heard from in Portland in Victoria have moved out of their houses claiming similar sorts of adverse affects. Have you thought of moving?

Mr Walkden: Yes, all the time.

Senator LEYONHJELM: Why haven't you?

Mr Walkden: I have got nowhere to go.

Senator LEYONHJELM: You have got a business there did you say?

Mr Walkden: I used to have a business. I used to have a small nursery. I used to do the weekend markets, but things got too difficult. I had too many cognitive problems and psychological problems from sleep deprivation that I gave it away. I could not cope anymore.

Senator LEYONHJELM: Mr Forbes, what information do you have on an international basis that might help this committee from adverse affects, the economics of turbines or the CO₂ reductions? I know you have made a study of this yourself. Can you help the committee with a summary of what you have learned?

Mr Forbes: I have not done detailed calculations myself, but I have seen other people who have made such calculations. You only have to think about the operation of the whole system to know that by the time you construct all the new roads, construct the enormous foundations for something like 5,000 tonnes of concrete in the base of a turbine, manufacture all the turbine parts themselves, transport them to the site, erect them on the site, get the turbine working, erect all the transmission lines to take the power back to some sort of a distribution point to go to the cities, and then run the backup plan—build a new backup facility which is usually a gas facility and run that intermittently and very uneconomically—it is not hard to see there is no net benefit in carbon emissions from wind power from the carbon dioxide emissions caused by all of the diesel, all of the construction, all of the cement manufacture, all of the steel manufacture and all of the transmission lines. I only saw an article, which the committee has probably seen, at the weekend in *The Australian* of a new study showing that there is very little benefit, if any.

The other point is: is there any benefit in reducing carbon dioxide? Carbon dioxide is not a pollutant. It is not a danger to our climate. It is of great benefit to all of our farmers because it is a fertiliser for plants. Why in heavens name are we spending so much money and effort to reduce something which is inherently beneficial to all green things and all life on earth.

Senator LEYONHJELM: I have followed some of your work for quite a long time. I know you are very interested in this subject. Do you know of any studies, and hopefully more than one, that have quantified that summary of the CO₂ situation, the emissions situation, that you just ran through? Do you know anyone who has actually done the work on it, or more than one?

Mr Forbes: I cannot give it to you out of my head, but there is probably at least one study by Peter Lang on our website. I can certainly find studies for you and I am happy to do that. I cannot tell you out of my head right now.

Senator LEYONHJELM: Could I ask you to do that as it is one of the terms of reference of this committee and I think it would be helpful. The reason I am asking is that I know you have looked at this sort of stuff for quite a few years—could you please assemble what you have and send it to the committee?

Mr Forbes: Yes I will do that. I must say it has never been a top priority of mine because I have never seen any benefit in reducing in carbon dioxide—so who cares whether it is increased or decreased by wind farms.

Senator LEYONHJELM: That may be so but the government—I am not part of the government—takes a different view and has a policy so therefore the objective information is relevant to that. In any case, it is one of the terms of reference of this committee.

Mr Forbes: Yes, I will do that. Senator Marshall, one small point on the evidence produced by Mr Walkden, I saw a comment by a real estate agent who said no-one ever asks me to find a property near a wind turbine but many ask me to sell properties near turbines.

Senator MARSHALL: Mr Walkden, I was actually interested in what you said about the proposed remediation works that were going to go on—were you confident at that point that some of those remediation works would have alleviated your situation?

Mr Walkden: No, not what I knew about double-glazing and stereos—I already had a stereo—none of those things would have made any difference in my opinion.

Senator MARSHALL: Right, I took it from your evidence that you were disappointed that those things were not delivered and you thought that they were just being offered while the sale went on.

Mr Walkden: That is correct, they were just being offered. They knew they were going to sell—

Senator MARSHALL: You were not actually disappointed because you did not think that any of these things would work anyway?

Mr Walkden: I did not think that.

Senator MARSHALL: I am glad I clarified that. Did they proceed with the insulation in the roof?

Mr Walkden: Yes.

Senator MARSHALL: Did that make any difference?

Mr Walkden: Very marginal.

Senator MARSHALL: Was that just for your general wellbeing?

Mr Walkden: Yes.

Senator MARSHALL: Thank you for that. Mr Forbes, I think I missed the last bit of your submission—I think you were indicating to us that wind power is something promoted by environmental extremists to do what?

Mr Forbes: There is no doubt that some leaders of the extremist green movement understand that wind power will destroy industrial society. They know very well that no-one can run—smelters and refineries, continuous operations like electric trains and hospitals, or continuous manufacturing on high-cost intermittent power such as wind power.

Senator MARSHALL: So you believe this is a conspiracy of environmental extremists who undermine the industrial basis of our society?

Mr Forbes: I do not think it is a conspiracy. They make it quite obvious, all you have to do is read some of the things they have said—they do not hide the fact that one of the chiefs of the UN IPCC said isn't it our responsibility to ensure that industrial society collapses. They do not make any secret of it, it is not a conspiracy.

Senator MARSHALL: Are they in league with the UN to do this?

Mr Forbes: I am sure there are some well-meaning people in the United Nations who think this a great benefit for the environment and some of them who fear that somehow we are affecting the climate, but there are others who have clearly said even if the theory is wrong, even if carbon dioxide has no effect on the climate, let's ride this issue for all it is worth.

Senator MARSHALL: Would you be able to point us to some of those statements?

Mr Forbes: Undoubtedly.

Senator MARSHALL: I think that would be useful for the committee.

Mr Forbes: In fact they are in my submission.

Senator DAY: Mr Forbes, it is reported that you do have extensive experience in assessing the financial evaluation of energy industries, including wind and all the others.

Mr Forbes: I have never done an economic study of a wind tower, but I have done lots of economic studies of generation coal, generation gas and generation industrial investment proposals.

Senator DAY: That is the line of my question. We do have a major political party in Australia who are committed to 100 per cent renewable energy. Given your comments about industry, what is your view on the ability of renewable energy to meet the demands and requirements of industry in Australia?

Mr Forbes: It is totally impossible except at enormous cost. To generate continuous power from wind energy alone would require an enormous battery system of some sort of batteries—it either has to be pumped hydro or some sort of compressed air or huge banks of traditional batteries. There is no possibility that wind power alone could generate all of Australia's energy and leave the Australian economy as it is now.

Senator DAY: Renewables are not confined to wind energy alone, of course. There are solar and hydro and other forms of so-called renewable energy, described as. With the inclusion of all those forms of renewable energy, are you still of the view that it is not possible to meet the demands of industry and consumers through renewables?

Mr Forbes: If you include nuclear and unlimited hydro, you can certainly produce all the electricity Australia needs without emissions of carbon dioxide. Hydro is not a great resource for Australia, and every hydro location has already been put out of bounds by the Greens. Nuclear seems to be out of consideration. As to the chances of us running with solar, wind, wave or anything else, it will all work on the doodle pad of a green environmental engineer. It will not work when somebody starts to put together the capital investment required and the back-up facilities required—and if you are not going to back up with gas, what do you back up with? There is nothing in Australia that can be switched off and will deliver power when it is switched on. Wind won't, solar won't. Hydro will, but there is a limit to hydro in that we do not have enough sites, and if we have a big drought the hydro facility does not have its resource. There is a study by a very reputable Australian engineer who I think is appearing before the committee, probably in Sydney, who looked at the possibility of running Australia on 100 per cent renewables.

Senator DAY: Mr Walkden, there is a reference to the phrase 'environmental stressors' in your submission. I have not heard that phrase before. Can you elaborate on that for me?

Mr Walkden: I find it a bit difficult, too. It is from my psychologist, I gather, in his report.

Senator MARSHALL: Chair, this is a confidential submission and it ought not be referred to by anybody. Maybe I could ask this question, because I was a little bit puzzled why, apart from the medical evidence you have attached to it, it needs to be confidential. Was it only confidential because of the medical things?

Mr Walkden: Medical-psych, yes.

Senator MARSHALL: It might be easier if we receive the bulk of the submission excluding the medical attachments. That way it can go into the evidence. Your submission would be more useful if it becomes a document that the committee can rely on. If it remains a confidential document, it is as if we had never seen it, to be honest. So, if that is the only reason why Mr Walkden wants it to be, I would be happy to move—well, I do not know if I can move this, as a participating member—

Senator CANAVAN: I will move it.

Senator MARSHALL: that the submission, excepting for the medical certificate, be accepted as a submission.

Senator CANAVAN: Providing, Mr Walkden, just to confirm, that you are perfectly comfortable with that approach.

Mr Walkden: Yes.

Senator CANAVAN: I move that, then, Chair.

Senator DAY: I had just extracted that phrase as a generality as to what that terms means or how it is defined, rather than going to any details of your submission.

Mr Walkden: I am not exactly sure myself, actually, what that would mean; I do not have expertise in that, it being a medical term, I suppose.

Senator DAY: The follow-up question is: have you taken any further legal action, and is that a basis of tort—the injury or losses that you have suffered as a result of these environmental stressors? Has that been the basis of any action taken or legal advice you have had?

Mr Walkden: I have not taken any further action. I do not have the funds necessary to take anyone to court.

Senator BACK: The point was made this morning by a witness that wind itself is predictable, and, therefore, electricity generated from wind turbines will be predictable into the future—I think I understood them to mean both in terms of the fact of the wind blowing and wind strength. Is that consistent with your understanding of the predictability of wind?

Mr Forbes: No. That is totally inconsistent with my understanding and with the experience of wind farm operators. All you have to do is to have a look at the yachting races; they go to extreme lengths to work out what the wind is going to be doing tomorrow, and seldom do they get it right. It is just a nonsense to suggest that wind, in any part of Australia, is totally consistent and predictable. The only place where winds may be predictable is way up in the upper atmosphere, in the jet stream—if we could get a wind tower that tall—or some places on earth where there are very predictable westerlies roaring across. King Island might have a fairly predictable westerly wind at certain times. There is no doubt that there are trade winds and the sailing clippers used to use them, but they regularly got becalmed as well. So, no, it is not true. Anyone who says that needs to prove their point.

Senator BACK: Mr Walkden, you were residing on your property when the Windy Hill wind farm was first developed?

Mr Walkden: Yes.

Senator BACK: At that time, I think you said to us—I can say, now that your submission in the main is public—that your residence is 450 metres from the closest towers and five turbines are within 750 metres. At the time it was proposed, was that ever expressed as a concern? And was there any setback distance at that time? In the light of what we know today, 450 metres is ridiculous and five of them are within 750 metres.

Mr Walkden: I believe that that was the New Zealand standard 6808, and that provided for, I think, a 400 metre setback. I stand to be corrected on that, though. At the time I think it was 400 metres, and I was just outside it, so it was okay to build it.

Senator BACK: Four hundred metres?

Mr Walkden: From memory, that was the standard applied to that project.

Senator BACK: Apart from some insulation in your roof, were you compensated, or did you seek compensation, in any way, either monetarily or in other terms, in consideration of what you have experienced?

Mr Walkden: No, I have not.

Senator BACK: You have not asked or it has not been offered or it has not been accepted?

Mr Walkden: I was of the opinion that I would get nowhere and there was no point in pursuing it.

Senator BACK: You mentioned to us that it was within a couple of months of the first turbines operating that you started to experience this sleeplessness. You also said that when you are not at your home you have no trouble sleeping. When you do leave your home, for whatever reason, does it take you a couple of nights, or two or three nights, to get back to what would be a normal, uninterrupted sleeping pattern? Or is it immediate?

Mr Walkden: Probably the second night away. I mostly go to visit my parents down south, so the travelling experience would take a bit out of you. That first night might have been a little difficult, but the second night I was fine.

Senator BACK: Has that been consistent? Has it happened to you multiple times, not just once?

Mr Walkden: No—all the time.

Senator BACK: When you return home, is this impact that you report pretty well instant, or is there again a two- or three-day delay from the time you arrive back home—assuming that the wind is blowing—before you start experiencing this sleeplessness again?

Mr Walkden: That would depend on the strength of the wind. If it is strong when I get home, I will have difficulty straight away. If it is a good night, I will be fine.

Senator BACK: Can I ask you finally, is sleeplessness the main clinical impact, or the only clinical impact that you experience?

Mr Walkden: Yes.

Senator BACK: Can you give us the experience of your neighbours? Do you have neighbours who have wind turbines within 450 metres or 750 metres of their homes?

Mr Walkden: No. I am the closest one that I am aware of. I think the Newman couple have moved away. They were on the other side of the hill. They would have been the same distance as me, or perhaps a little further away. They experienced the same problems as I have.

Senator BACK: So you have experienced this at night. Presumably demand for power is not all that great through the night, because obviously it is real time power generation, it is not stored power generation. Have you or the council or anybody else on your behalf ever negotiated with the operators of this wind farm to not run their turbines at certain times in the night, when there is not a demand for the power anyhow?

Mr Walkden: Not that I am aware of, although that would have been before the Land and Environment Court, I think, in that case. It was recommended that they were closed down overnight, I believe, but nothing came of that.

Senator BACK: I am aware that there is a precedent around Australia that operators have come to agreements with affected people that they will not run their turbines at certain times. Is that something that is ahead? I get the impression that you cannot afford to leave; you cannot sell your dwelling; you cannot go anywhere else. So you are stuck with it. I am trying to get to an understanding as to what can be done. The roof insulation did not work. You already have a stereo—that does not work. You believe that double glazing would not be of any assistance to you. I am asking, in your view what is possible into the future? Would it be the fact of negotiating with the operator to not run their turbines at certain times of the night?

Mr Walkden: I think that would be wonderful. Definitely.

Senator BACK: Is there any action being taken by anybody?

Mr Walkden: No. RATCH will not have anything to do with me anymore.

Senator CANAVAN: Have you put that proposal to them directly—to turn them off at night?

Mr Walkden: That was in Dr Thorne's report, I think, which they would have witnessed or seen, but I have not personally done that.

Senator CANAVAN: And you say that they do not talk to you anymore. What does that mean in practical terms? They do not return your letters or phone calls?

Mr Walkden: I have virtually given up on them now. It looks like I am stuck with it and I have to live with it.

Senator MARSHALL: As a rhetorical question, getting back to the fact that you cannot sell your house: have you tried to sell your house?

Mr Walkden: Yes.

Senator MARSHALL: And what has been the outcome?

Mr Walkden: There has been some interest. Mostly, those who are fairly keen on buying the property when they first see it—they think, 'Wow, what a lovely property!'—get out of their car and say, 'Sorry, the noise from the wind farm would drive us mad.' They get in their car and go. That has happened a lot of times.

Senator CANAVAN: Has RATCH offered to buy it?

Mr Walkden: No.

Senator CANAVAN: Have you offered it to them?

Mr Walkden: I wish I could.

Senator MARSHALL: So is yours a house block, or is it a massive—

Mr Walkden: It is under five acres—a lifestyle block.

Senator CANAVAN: How many people would there be within 1.5 kilometres of a turbine in your area?

Mr Walkden: On my side of the hill my neighbours would be about 800 to 900 metres away; I think they would be next closest. The problem is that there are a few people around to the left of the wind turbines and they are not in direct line of the wind.

Senator CANAVAN: So ballpark, we are perhaps not even talking double digits within 1.5 kilometres?

Mr Walkden: There would be six.

Senator CANAVAN: Six people?

Mr Walkden: Yes.

Senator MARSHALL: And they are all five-acre blocks?

Mr Walkden: No; there are some bigger blocks. I am the only five-acre block. The dairy farm would have 600 acres, I suppose. My neighbour has 40 acres.

Senator LEYONHJELM: We touched on this before, but do you know what their views are on the effect the turbines have on them?

Mr Walkden: My closest neighbours do hear them from time to time. While he was operating his dairy farm he used to get a bit of a flicker on his actual dairy. That was a little bit concerning to him. He suffered health problems and they sold their herd a couple of years ago. He has gone to be an electrician, I think in the mines.

Senator LEYONHJELM: They do not complain about sleep problems?

Mr Walkden: No, they do not have any problems.

Senator LEYONHJELM: I am not too surprised—although we are not talking about rock-solid science here—that there is a much closer proximity problem in your case given the power of the turbines. There does seem to be some suggestion from the evidence we have received that the bigger the turbine the wider the impact. How many turbines are there in the wind turbine farm next to yours?

Mr Walkden: Twenty.

Senator CANAVAN: What is their size?

Senator LEYONHJELM: They are only small; they are 0.6.

Mr Walkden: Yes, very small.

Senator LEYONHJELM: As Senator Marshall just commented, they must be nearing the end of their life.

Mr Walkden: I hope so. I think they have another five years, but, as I have mentioned, you can hear the bearings wearing out. There has been no maintenance done for at least two years that I am aware of. They are just not bothering.

Senator LEYONHJELM: I know this is probably an impractical suggestion because it will cost money, but audible noise would definitely breach their planning limitations, I would have thought. So, if those bearings are making audible noise, my feeling would be that you would probably have a very sound case for a complaint. You would have to have somebody measure it—that is the only thing.

Mr Walkden: The council will no longer communicate with me either. If I write them letters to inquire as to when the next monitoring will take place, they will not acknowledge that letter.

Senator LEYONHJELM: That is Mareeba council.

Mr Walkden: TRC—Tablelands Regional Council.

Senator LEYONHJELM: They won't talk to you?

Mr Walkden: No.

Senator LEYONHJELM: Why is that?

Mr Walkden: I want to get this right. After the decision—which I think Councillor Pagani mentioned—in the council, they decided it was not worth taking it any further because they believed they were compliant anyway, even if it was only 0.6 of a decibel. They were compliant, so they could not do anything about it. That is the reason why. I got the letter back and there were words to the effect that: 'We believe them to be compliant and there is no point in taking it any further. No further communication will be dealt with with you.'

Senator MARSHALL: We have got a name for you. There was a councillor with us earlier today, Ms Marjorie Pagani. I think you should give her a call. She seems right on top of this issue.

Senator CANAVAN: And she is not in your ward. She is not your councillor.

Mr Walkden: No. I was told that to do further monitoring it would have to come as a request from a councillor, not from me.

Senator CANAVAN: This is Windy Hill. You may have heard earlier that RATCH indicated that there would be more monitoring perhaps next year. They have committed to do it every three years. Are you aware of that?

Mr Walkden: No, I am not.

Senator CANAVAN: They did provide evidence to us this morning along those lines, from my recollection. There will be a *Hansard* transcript of this, which you may want to get hold of. Were you involved in the monitoring that occurred in 2013?

Mr Walkden: Yes.

Senator CANAVAN: Were receptors put on your house and your property?

Mr Walkden: Yes, I watched it all.

Senator CANAVAN: Did you feel comfortable in the accuracy of that monitoring and/or concerned about the results?

Mr Walkden: I am was very concerned about the results. Of the three major monitoring events, two of them were not done to the required New Zealand standard or the permit conditions. That was identified by Dr Thorne, I think, in his report. They had a lot of problems—equipment broke down, it rained and it damaged the microphone so they had to get a little cover to put over it—everything went wrong, it was dreadful. I thought: 'Here we go again. They are going to be compliant. They will figure it out somehow.'

Senator CANAVAN: They claim they were compliant—

Mr Walkden: They do, yes.

Senator CANAVAN: through the monitoring results. You are claiming that the measurements were inaccurate. Were the measurements under their requirements for audible noise?

Mr Walkden: They only did audible noise. They were not required, as far as I am aware, to do infrasound. One of the first times that Stanwell monitored, they did not do it to the standard required. It was supposed to be a certain distance from the house and things like that in their conditions, and they did not do that. One lot of measuring was taken at the back fence and that was not according to the New Zealand standard either. They did all these little monitorings, yes it all sounded good, but it was not what they were supposed to do. And I was not confident that they would continue to do that.

Senator DAY: Who was instructing the monitor? You are saying it was like a self-assessment by RATCH, or are you saying—

Mr Walkden: The RATCH was ordered by council.

Senator DAY: The assessors, the monitors, who were they?

Mr Walkden: What were they called—

Senator CANAVAN: Marshall Day, were they?

Mr Walkden: No, MWA, I think—

Senator CANAVAN: Oh yes, MWA environment.

Mr Walkden: up in Brisbane.

Senator DAY: They received their instructions from?

Mr Walkden: From RATCH.

CHAIR: As there are no further questions from the committee, I thank Mr Forbes and Mr Walkden for their submission and questioning today.

ALLWOOD, Mr Trevor Allan, Private Capacity
GARGAN, Mr John Ernest, Private Capacity
HEWITT-STUBBS, Susan Jane, Private Capacity
LYONS, Mr Bryan Alwyn, Wind Energy Queensland
LYONS, Michael, Wind Energy Queensland
MARTIN, Mr Stephen, Private Capacity
McAULIFFE, Mr Jeremiah, Private Capacity
McGUIRE, Dr Geraldine Mary, Private Capacity
REYNOLDS, Mr David Gordon, Private Capacity
SCHWERDTFEGER, Mrs Lee, Private Capacity
WATKINS, Ms Krista, Private Capacity

[14:45]

CHAIR: There is now an opportunity for the 10 people listed to give a short statement to the committee. This session will run for 30 minutes. There will be a strict three-minute time limit on these statements. When three minutes are up, I will ask the next speaker to take the microphone.

I remind all present here today that in giving evidence to a parliamentary committee witnesses are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of their evidence to a parliamentary committee, and such action may be treated by the Senate as a contempt.

I now invite Krista Watkins, Lee Schwerdtfeger, Bryan Lyons, Mick Lyons, David Reynolds, Jerry McAuliffe, Trevor Allwood, John Gargan, Susan Hewitt-Stubbs and Stephen Martin to the front table—and, if we have time, Dr Geraldine McGuire. Do you have anything to say about the capacity in which you appear today?

Ms Watkins: I am here as a private individual.

Mr M Lyons: I am a private individual but appearing on behalf of Wind Energy Queensland.

Ms Hewitt-Stubbs: I am here as a private individual, not representing anyone.

Mr McAuliffe: I am here as a private individual as well. I am certainly not representing anybody else.

Mr B Lyons: I am the spokesperson for Wind Energy Queensland.

Mr Martin: I am here as a private individual and a property owner within two kilometres of the wind farm development.

Mr Reynolds: I am a citizen of Rangeview, here as a private citizen, representing my wife, my family and my friends.

Mr Gargan: I live three kays downwind from the wind farm. I am a private citizen.

Mrs Schwerdtfeger: I live close to the Mount Emerald Wind Farm site, and I am just representing residents who do not have a say.

Mr Allwood: I am a resident of Rangeview, and I am here to represent my family.

Dr McGuire: I am an independent environmental and community consultant from the Atherton Tablelands, and I am here as a private individual.

CHAIR: Thank you. Could you all please confirm that the information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. I invite you now to speak.

Ms Watkins: Thank you. I live approximately three kilometres from the proposed site. My husband and I have a very successful business which we are building. When I listen to Colin's statements, it is extremely disturbing, as I live there, I work there and I do not move from that home base, which is three kilometres from that proposed site.

I have made a submission to the committee and have come here today to confirm my position and concerns over the Mount Emerald project. I firmly believe that both partners involved in this proposal have been indignant liars. All of the community concerns have been met untruthfully or with derailing answers. I have many examples of this and would be happy to provide them, although I am limited in time today. I have included some of them in my submission.

Environmentally, they have not been good neighbours. I have obtained satellite imagery, and the purposeful degradation of vegetation on the mountain is clear and visible. Most importantly is that when it is overlaid with the turbine map onto the satellite imagery it can be clearly seen that much of this devastation is along lines where turbines are planned. It is a very purposeful strategy in changing the ecology and making an EIS less complicated—no food, no animals, nothing to report. I will note that it is cypress pines that have been wilfully targeted, and they provide a major food source in the environment up there as a lot of bugs and insects use them to feed off quolls, and the quolls rely heavily on the insects as their primary food source. I also believe that other parts of the EIS have multiple flaws, and they are extremely serious in nature. They have taken only a very small sample of drilling for underground water supplies in such a vast area. The ratio is absolutely ridiculous, and it really needs to be addressed. I am happy to elaborate on that as well, in another submission.

I believe that they have cut corners with the community, especially in informing the community of what was going on, and also with the writing of the EIS. They cannot be trusted, and this has been proved multiple times. The mountain is home to endangered and Commonwealth protected species, flora and fauna both, which have not been accurately catered for in their EIS. I feel as though they have been so dishonest with the community and their questions that really they cannot be trusted to be accurate and to abide by the targets put in place to continue to be good neighbours, because thus far, without anything being constructed, they have not been good neighbours. They did not inform the community of what was happening. It was left to community members to inform other community members.

Mr M Lyons: There are members of the Atherton Tablelands community who are really suffering, and the root cause of this seems to be the subsidies coming from federal legislation. Without those subsidies, these wind farms would never have been commenced. The Tablelands Regional Council has tried to protect its community, and the members of the community who are suffering cannot afford to protect themselves. The Clean Energy Regulator is charged with the responsibility of ensuring that the Windy Hill wind farm complies with all laws—that is, federal, state and local. Breach of a condition of a development permit is a breach of the law. Potentially, the Windy Hill wind farm has breached a number of its conditions, including its monitoring conditions and its noise limit conditions. The council has tried to enforce both but has not reached a satisfactory conclusion. When we complained to the Clean Energy Regulator their answer was simply that if they have a permit they are acting lawfully. They would not investigate at all. My question is: is this a classic case of a callous, foreign owned corporate citizen falling or hiding within the cracks between the federal law, the state law and the local law, while gaining significant subsidies from the RET scheme?

The terms of this inquiry ask how effective the Clean Energy Regulator is in performing its legislative responsibilities. The answer seems very clear: not at all. Given the problems created by the federal legislation, on any 'fair go' argument the federal government must bear the responsibility to fix it. The system that must be set up for the protection of the Australian citizens and interests must cover at least the following: accreditation approvals with adequate conditions to protect ordinary Australian citizens such as the Walkdens and the Newmans; adequate, competent, independent, regular monitoring and testing of compliance at the cost of the operator; effective enforcement of compliance at the cost of the operator, including removal of the subsidy by removing accreditation for serious or repeated breaches of conditions; adequate and effective conditions for removal of the wind turbines at the end of their economic life; and reinstatement of the land at the cost of the operator.

One further point I would like to make is that the Mount Emerald wind farm noise limit is 35 dB(A)(LAeq) at night. The evidence both from RATCH witnesses and from Greg Chemello is that noise should be averaged over only 10 minutes. Can the Senate committee please write to Minister Trad to take away the anxiety arising from the expression in the present approval and request confirmation that the noise limit is in fact 35 dB(A)(LAeq), adjusted 10 minutes, and not as written in the approval.

Ms Hewitt-Stubbs: I want to let you know the concerns I have. A couple of years ago RATCH had a public meeting to inform everyone and allow us to come and have a look at what was going to happen. They had like a montage and computer set-up and you could say where you lived and have a look to see what it would be like from that position. On their montage, I do not know whether it was conveniently, they had taken out all the power pylons that go across Mount Emerald, which would have given you some sort of perspective as to how big the turbines would be. There was no perspective. There were no power pylons in their pictures, although they are there on the mountain for us all to see. When that matter was broached, the girl in charge of the computer was a bit flummoxed and she did not know how to answer the question.

Also, other evidence that they gave about some of the proposals is not correct. I am also from around the mountain. We have a volunteer fire service because that mountain is in one of the highest fire zones. In their proposal RATCH says that they have contacted the volunteer fire brigade and have permission from us to access

all our water supplies and get help from us if they should have a fire. My father is the secretary, and no-one has ever been contacted by RATCH with regard to firefighting on the mountain. It shows that they write what they think people want to hear, and they are not actually talking to the people on the ground. In their proposal they say that they have talked to the fire warden of the area for our brigade—in fact, the fire warden has nothing whatsoever to do with firefighting; all he does is issue permits for individuals to have a fire. If you need to burn off, you have to approach him and get a permit. He has nothing to do with fighting fires around the properties. This shows that what they tell other people and what they do is not straightforward. They should be more open and transparent so that everyone knows what is happening. A lot of us are pretty disappointed.

Mr McAuliffe: I must admit I did not take a great deal of notice of wind farms until about nine months ago when my wife and I went to Europe. In Ireland I have a first cousin who has one of these turbines on his property. He had some sort of knowledge that it was going to go there because he did say that these people who put it there came around, saw him and discussed it with him in his own kitchen. I guess they may have given him an up-front payment or some ongoing payments or something like that. They told him, as he said, as the Irish say, 'a whole heap of fecking blarney, Jerry'. This is what happened. He has the wind farm, he is stuck with it, and he would give any money back—he would give anything—to be rid of that wind farm. He says it has just been a pain for him and a pain for his wife. His wife sits inside the house virtually all the time now—she does not like coming out. It has got to the stage where he hangs out the washing—she does not like looking up because she sees these confounded wind turbines. He said it has affected her health, and that is why she stays inside—she has become a virtual recluse. Of course it has affected him as well—I do not know of any man who likes hanging out washing; I certainly don't!

My cousin has quite a reasonable farm in Newmarket in County Cork. That is where my father came from. He has been farming that his whole life and, as he said, he was told a whole heap of lies. He took us to the back of his house and he looked up—and we could see them. He took us out the front—it is higher up—and we could see them. They were much more prominent. I could see the difference in him going from the back to the front of that house. It almost affected me as well, because I could see what he was getting at and the way that it has affected his wife. It has just been a terrible thing for him. I would not like to see this happen to my wife or to any person—any human being at all. That is the human aspect of these wind turbines that I saw when I was in Ireland.

I also believe that we people should be given the benefit of the doubt. I have been on juries at times, and they talk about 'beyond reasonable doubt'. How the hell can anybody prove these wind farms, with the doubts that we have heard here today? You people have had doubts; we people have had doubts. I have heard nothing but doubts, doubts, doubts. Who really knows anything about what health effects they are having on a lot of people, and why should we be subjected to these particular problems if people do not know what is going on? Please, allow us people to have the benefit of reasonable doubt, as any person in a criminal court would have. We have not had that. Surely, we are entitled to that. The third thing I would like to say is that I would love to see some of these people from RATCH with one of these turbines in their own backyard. Our comic here today! I would like to see one in his backyard and him to come back in three years time and for us speak to him again and see if he is as comical as he was today!

Mr B Lyons: I am from Wind Energy Queensland. We formed the group about 18 months ago. It was primarily formed because of our concerns about the way wind farms were being planned in Queensland. We basically represent five main communities who are dealing with wind farm projects. After sitting through today—and we have dealt with the Queensland government regularly over the last 18 months—we are still concerned about the way that wind farms are being planned in Queensland. We heard from Mr Chemello this morning. He is seeking advice from three acousticians. That is very convincing, and we feel warm and fuzzy about that. When we look at those three acousticians, King, Terlich and Savery, none of them have ever worked with an operating wind farm. They are based in Brisbane. They have no experience with an operating wind farm, measuring wind turbine noise.

We heard evidence from Dr Bob Thorne today. Dr Thorne, I believe, spends a lot of his time in New Zealand. He also has a business based in Brisbane. He worked for the Queensland government as a compliance officer back in the nineties. He was involved in developing the first Queensland government noise policy. You heard his evidence before. He does not believe that the existing Queensland government know who he is. Our concerns are that they are not using the expertise that is out there. Bob Thorne has given high recognition to the work from Steven Cooper. It has been very poorly reflected in the discussions here today. It has not been reflected in the decisions that have been made—the decision on Mount Emerald wind farm—on basic things like amplitude modulation. There is no condition in there to cover it.

We heard from Mr Chemello that 35 decibels outdoors is the same as 30 decibels indoors. Thirty decibels indoors is the Queensland noise policy. That is what they use to regulate all industries except for the wind industry. They have applied 35 decibels outdoors. Mr Chemello says: 'Well, they are the same thing.' Hang on a second! We have had testing on three homes in our particular region. They showed that one house reduced the noise level from outside to inside by one decibel. The second house, which was my home, reduced it by two decibels. The testing of the third home reduced it by three decibels. Mr Chemello's assumption is five decibels. You take the precautionary principle and you take the benefit of the doubt. They have taken it to the extreme. They have allowed five. Hang on! If you want to allow the benefit of the doubt to the communities, make it zero, make it one—at least around the minimum. Our concerns are that the planning of wind farms is still inadequate. I would like to reinforce the point that my colleagues made. It is being driven by the federal government. We would like the federal government to come in and assist in the accreditation for renewable energy certificates.

Mr Martin: My property's boundary is within a couple of kilometres of the wind farm at the base of the mountain. The farm has been there for nearly 45 years. My father developed it after he migrated here. He did a lot of work by hand. I have since taken on that farm. It was an old tobacco farm. I have since turned it into one of the biggest organic farms on the tableland. It is a 108-hectare farm, of which 77 hectares is now certified organic land. I am amazed that, with all this consultation, which the developers say they have been through, not one of them has come to my farm and spoken to me—not one. Here I am. I have 4,500 trees under organic status and I am providing some of the best organic nutritional produce anywhere in Australia, and that can be confirmed by the wholesalers that I sell to. I do not have a say in what goes ahead because no-one has given me the opportunity to do that.

On the nature of organics, I rely on that exact word—'nature'. There is pollination by the bush bees and other bees. Have any studies been done on the impact of low frequency noise? No, there haven't. How is it going to impact on me? I have a family. I have five kids. I am trying to build a future for them. I am not trying to build a future for the developers; they are trying to do that for themselves. So, at the end of the day, my question to the committee is: why hasn't anybody approached me about the impact of this on my family and my future?

Mr Reynolds: My wife and I retired to Rangeview five years ago, which is coming up this July. We have a nice property 4½ kilometres to the east of the proposed site at Mount Emerald. Rangeview, which is the suburb I am in, has approximately 440-odd households. You would have to say we are coming up to 1,600 people, plus neighbouring suburbs. With the areas nearby, certainly on the eastern side of the range, you would come up with the best part of 2,000 residents in that area. I would suggest then that this proposed installation would have to be unique in that it is the only one which I am aware of in Australia to have so many people living in such close proximity to it—certainly within five kilometres of the site. It is quite a frightening thought, really.

When we retired to Rangeview, it was: yes, it is a lovey quiet suburb. We enjoy it here. Quite seriously, the only noise we get is on a Monday morning at five o'clock with the garbage collection truck—and that is it! Other than a few cars around the place, it is peace and quiet. Now we are about to be inflicted—that is, if it goes ahead—with these monsters up here, with a 37-decibel limit. That is very sort of iffy as far as I can see. We have a standard of 35. They are even outside the Queensland standard of 35 decibels. So where 37 has been plucked from, I have no idea. It really worries me.

I wrote to the committee. My submission is No. 191, and I basically focused on the threatened health issues, I suppose you would call them. What the heck is going on? We came up here with a very, very open mind. My career was in aviation and my wife's was in nursing. We thought: 'Yes, renewable energy; that's a good thing. Let's do a bit of research on it first.' Every bit of research I did convinced me that it was not a good idea, and nothing I have heard this morning has made me change my mind. In fact, it has basically reinforced every opinion I have had. I have heard what I would call 'rubbish' spoken to you by the RATCH representatives. I heard Marjorie Pagani, our local councillor, refute that, and I think she did rather a good job of it. I am interested to note that the other half of the Mount Emerald wind farm partnership, Port Bajool, have not even had a say here morning. I thought they would have been up here ready to tout their case so that we could pull them apart.

That is basically the thrust of my argument, gentlemen of the committee. I believe that the National Health and Medical Research Council findings—their absolutely abysmal findings—were blasted by peer review around the world; they have had the blinkers on. To me there is just no way around it. Unfortunately it would appear, unless you gentlemen can come up with something, that Jackie Trad, in her ignorance and arrogance, has basically condemned us to 25 years of damn near hell from the health problems we are likely to receive from these things. Thanks very much for your time.

Mr Gargan: I am John Gargan. I have lived at Springmount Station at the base of this mountain, which used to be our country once. Then it was sold and sold, and eventually Port Bajool bought it. What they have done to

the community in Oaky Valley is absolutely appalling. They have subdivided the valley and charged people exorbitant money for blocks of land and put caveats on the land so that they had to build to a certain standard. So a lot of people have come to our valley—our district—and spent millions of dollars, and now they want to put a wind farm above them.

When they decided they were going to build the wind farm, they reduced the sale price of their properties to try and get rid of them before the wind farm comes in. In effect, they have wiped \$1.5 million off the economic value of the valley and the council's rate, because that is the Valuer-General's devaluation. Apart from that fact, if you want to sell a property there now, you have probably got two chances—none and zero. That is a disgusting thing to do.

But apart from that is the fact that the community has had no input into this because it was code assessable; we had no legal right, so it got passed to the state government and we still had no legal right, so the assessors probably had no legal right to take any notice of our complaints. It has been an outrageous process. The only hope we thought we had was the EIS, because in the draft conditions it said we had the possibility that it would look into the human element. But now we find that that is covered by the EPBC Act or something that only looks at critters. Goodness gracious me—I would like to be a critter, or even to talk for a critter would be good, because we have been totally ignored. It is absolutely unfair—2½ thousand people have not fallen through the cracks; we have fallen into a chasm. Thank you.

Ms Schwerdtfeger: My name is Lee Schwerdtfeger. Greg Chemello was here this morning representing the state government. He stated that: 'the government cannot say no to wind farms.' This confirms the state's policy announcement last week that the state has intentions of obtaining 50 per cent of its electricity from renewable sources by 2030.

The state has a vested interest in approving wind farms. This is reflected in the appalling approval conditions for the Mount Emerald project. The deputy premier has ignored the best advice available from the government's own noise experts and Dr Bob Thorne, who has spent many years doing case studies in wind farm-affected communities. There is no requirement for reduced noise levels where the noise has particularly annoying characteristics, as occurs with other industrial developments. There is no requirement for measurement of noise indoors, as is required of High Road wind farm.

I think I speak for most residents here who would be happy to have noise monitored inside their homes to ensure that the wind farm is complying with state requirements. The approval conditions have no mandatory process for dealing with noise complaints. RATCH writes their own complaints management plan, and this does not have to be approved by the state government. So why do other approval conditions all require that management plans be submitted and approved, not merely submitted? Is this a deliberate oversight by the state government to favour the developer? We can be sure that noise complaints will never be properly dealt with if this project is ever built. This will just be more of the same from RATCH.

I can only say that with 700 properties and 2,500 residents within five kilometres, including 800 inmates at the nearby Lotus Glen prison, the Mount Emerald development is a disaster in the making. This is a foolish proposal by RATCH. If the federal government insists on mandating a requirement for renewable energy, it can only morally do so if the necessary health studies are done and wind farms are properly regulated.

Mr Allwood: I would like to thank you very much for coming today and being available to hear our concerns. I have a small business in the township of Tolga, which is approximately 10 kilometres from the proposed wind turbine farm. Three years ago my wife and I decided we would build at Rangeview, positioning our house on a one-acre block with a view of the range. It is a particularly spectacular range and I think that a lot of people need to see that range to see what they are going to do when they destroy it with turbines. I also have a daughter, a son-in-law and two grandchildren who intend building at Rangeview in the very near future—they have a block of land there and they are extremely concerned. As a grandfather, I am very concerned about my grandchildren now living in that region because we are less than four kilometres from the proposal. I attended the RATCH public meeting in Walkamin a couple of years ago and was told that we will have a lovely view of 43 turbines from our house. At my age I can have the attitude that it does not really matter but I can tell you now that it really concerns me and I get very emotional when I think about my grandchildren.

Loud applause—

Dr McGuire: I would like to thank the Senate committee today for the respect that they have shown to the group of people here. I think this is the first time this community has actually been listened to during this whole process and that really means something to all of us who live in this region. From what you can see today, the people that live in this community are not a bunch of nutters who are worried that their chooks are going to stop

laying eggs because of the wind turbines—they are informed, intelligent people who have genuine concerns about this issue. We talk about the precautionary principle. I am a scientist; we do not know the answers. Someone said this morning it was where Galileo was at—that is where we are right now. It is a really critical point in time about wind turbines across the world.

My consultancy company works across the world; we work throughout Asia and the Pacific and, while I am proud to be an Australian, I am actually embarrassed at that level of regulation that we have in Australia for many of our developments, particularly around the social impact assessment aspects of our developments. When I work in Asia, it is compulsory to go to every household and sit around the table and ask people about the matters that are important to them. You know what? It is about their health. It is about the access to health clinics, to their own concerns, to properly be able to speak about these concerns and to have them addressed and also mitigated in a reasonable way.

Today we have started to talk about mitigation measures—these need to be embedded in our legislation; these cannot just be more talks that we have. We need to change the way that companies like RATCH have to behave, because they are a tick and flick company. There are obviously companies who understand the business case of consulting but there are others that do not. We need to legislate that there be a commonality across all these companies so that they have to understand the issues that people are concerned about. In terms of monitoring, wind farms are complex. I have worked in the mining and oil and gas industry for over 20 years and the monitoring there is complex, but from what I am learning about wind farms it is even more complex. It is not just about decibels; it is to do with how we measure the infrasound. It is not just about distances away—because of mountains being the shape they are and wind being the way it behaves, it is much more complicated than just how far away you are from the wind farms. It is really a lot to do with the shape of the mountains and your proximity to that particular aspect. Thanks for the time. I really hope that something positive comes out of this senate committee.

Loud applause—

CHAIR: I wish to thank all members of the public and companies et cetera who have given evidence here today. I now adjourn the Senate committee here in Cairns.

Committee adjourned at 15:20