



COMMONWEALTH OF AUSTRALIA

# Proof Committee Hansard

## SENATE

COMMUNITY AFFAIRS REFERENCES COMMITTEE

**Reference: Social and economic impact of rural wind farms**

FRIDAY, 25 MARCH 2011

CANBERRA

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## **SENATE COMMUNITY AFFAIRS**

### **REFERENCES COMMITTEE**

**Friday, 25 March 2011**

**Members:** Senator Siewert (Chair) and Senators Adams, Boyce, Carol Brown, Coonan and Moore

**Participating members:** Senators Abetz, Back, Barnett, Bernardi, Bilyk, Birmingham, Mark Bishop, Boswell, Brandis, Bob Brown, Bushby, Cameron, Cash, Colbeck, Cormann, Crossin, Eggleston, Faulkner, Ferguson, Fielding, Fierravanti-Wells, Fifield, Fisher, Forshaw, Furner, Hanson-Young, Heffernan, Humphries, Hurley, Hutchins, Johnston, Joyce, Kroger, Ludlam, Ian Macdonald, McEwen, McGauran, Marshall, Mason, Milne, Minchin, Nash, O'Brien, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Stephens, Sterle, Troeth, Trood, Williams, Wortley and Xenophon

**Senators in attendance:** Senators Adams, Siewert, Carol Brown, Boyce, Fielding and Furner

#### **Terms of reference for the inquiry:**

To inquire into and report on:

The social and economic impacts of rural wind farms, and in particular:

- (a) Any adverse health effects for people living in close proximity to wind farms;
- (b) Concerns over the excessive noise and vibrations emitted by wind farms, which are in close proximity to people's homes;
- (c) The impact of rural wind farms on property values, employment opportunities and farm income;
- (d) The interface between Commonwealth, state and local planning laws as they pertain to wind farms; and
- (e) Any other relevant matters.

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**Committee met at 9.05 am**

**CHAIR (Senator Siewert)**—Today the Community Affairs References Committee commences its public hearings for its inquiry into the social and economic impacts of rural wind farms. I welcome officers from the Department of Climate Change and Energy Efficiency. Information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. As departmental officers, you will not be asked to give opinions on matters of policy, although this does not preclude questions asking for explanations of policy or factual questions about when and how policies were adopted.

[9.06 am]

**BAILEY, Mr Andrew, First Assistant Secretary, Renewables Energy Efficiency Division, Department of Climate Change and Energy Efficiency**

**TONNA, Mr David, Director, Renewable Energy Policy and Partnerships, Strategy and Partnerships Branch, Renewable Energy Efficiency Division, Department of Climate Change and Energy Efficiency**

**CHAIR**—I invite you to make a short opening statement, if you wish to do so, and then we will ask you some questions.

**Mr Bailey**—I will give a slightly abbreviated version of this written statement. The Department of Climate Change and Energy Efficiency has responsibility for the renewable energy target, the RET, and the coordination of activities to finalise the National Wind Farm Development Guidelines, which we generally refer to as the guidelines. Wind farms supported by the government's RET scheme have an important role to play in achieving the government's commitment, with an equivalent of at least 20 per cent of our electricity coming from renewable resources by 2020. Through the RET and the guidelines, Australian government policy is supporting wind farm development at sites that have wind availability and that are sensitive to the concerns of local communities.

The RET guarantees a market for additional renewable energy by legislating annual targets and using a tradeable certificates mechanism to ensure the targets are met in a cost-effective manner. The RETs support the deployment of large-scale renewable energy power stations, such as wind farms, as well as small-scale renewable energy technologies, including rooftop solar panels and solar water heaters. The RET is a key transitional measure. In the longer term, a carbon price is expected to be the primary driver of ongoing investment in renewable technologies.

Wind power installed and operating in Australia has grown from just a few megawatts of capacity, prior to the commencement of the mandatory renewable energy target in 2000, to around 2,000 megawatts in 2010, generating about 6,000 gigawatt hours. The RET is projected to drive around \$16 billion of investment in renewables by 2020. Wind power is currently amongst the lowest cost renewable energy technologies available. As such, projections currently suggest that wind energy will constitute a significant proportion of large-scale renewable energy generation under the RET, possibly a third of renewable generation by 2020. Assessment of wind farm development proposals is a matter for states and territories, with the exception of matters of national environmental significance, which are assessed under the Environment Protection and Biodiversity Conservation Act 1999. The Department of Sustainability, Environment, Water, Populations and Communities administer this act.

The draft National Wind Farm Development Guidelines 2009 was released for public comment from 28 October 2009 to 16 December 2009. After conducting an extensive review of over 70 public submissions, the revised draft guidelines had some substantial differences to those released for public comment. In July 2010 the EPHC released the draft guidelines 2010 for

a period of 12 months to allow further consultation with relevant stakeholders. The draft guidelines do not set environmental requirements. They aim to outline best practice for industry and planning authorities on how specific impacts of wind farms can be assessed. They are not intended to be mandatory or change existing jurisdictional statutory processes.

**CHAIR**—Because the Senate is sitting when the bells go, you will see us get up and leave. I apologise in advance if the bells go while you are here with us. I will make sure that I inform all the other witnesses of that as well. Senator Fielding.

**Senator FIELDING**—Thank you for your opening remarks. Obviously the renewable energy targets are one of the key drivers for renewable energy being used, and you have outlined that by 2020 \$16 billion, or roughly around that investment level, is expected, and you think that possibly 30 per cent will come from wind farm energy for that renewable energy target, which is quite a sizeable chunk—is that right?

**Mr Bailey**—Yes.

**Senator FIELDING**—We are not going to see fewer wind farms, are we? Are we going to see a lot more?

**Mr Bailey**—We expect so. Let me make a comment about expectations of the mix of renewable energy sources under the RET. The RET is set to be specifically technology agnostic. It does not say how we are going to slice it up.

**Senator FIELDING**—I am not trying to trap you to say that you can guarantee that it will be 30 per cent. What I am trying to portray is that the number of wind farms is going to increase reasonably rapidly, given that, as you said, wind is one of the lowest cost options at the moment.

**Mr Bailey**—Yes, indeed.

**Senator FIELDING**—It is envisaged that it would represent about 30 per cent of renewable energy by 2020.

**Mr Bailey**—Yes. That is the rough—

**Senator FIELDING**—I am not trying to trap you to say that you will guarantee that, because there could be something in five years time that may be renewable that may take over, but at the moment we would believe there will be a lot more wind farms in the foreseeable future. Is that correct?

**Mr Bailey**—We expect to see a growth in that area.

**Senator FIELDING**—The reason behind a lot of inquiry is that there is a concern about the health effects of living nearby wind farms or wind turbines. I was wondering what research the department has done on this particular issue. Can you outline what you have done and what you know about the adverse health effects of living near wind turbines?

**Mr Bailey**—The responsibility of this department is not to be the specialist in health effects. Our responsibility was to set the guidelines. In the process of setting those guidelines there was extensive involvement with the states and also extensive use of health experts so that the guidelines themselves end up taking a risk based approach, which means specific health issues will vary site by site. This department does not have ultimate responsibility for the approval of wind farms. That is a state matter and, therefore, our involvement in those matters stops at the level of the guidelines themselves.

**Senator FIELDING**—To me, this is the heart of the issue. No-one knows where to go about living so close to wind farms and the adverse health effects. Everybody says, ‘We’re just applying the guidelines.’ I will come back to that in a moment. It is not a question, it is just a statement. People are very confused about where to go to complain. We will hear from a lot of people through this inquiry about those sorts of issues, about where you go from there. Are you aware of the term ‘wind turbine syndrome’?

**Mr Bailey**—I have heard of it, but I could not say that I know a lot about it.

**Senator FIELDING**—So you would not know a lot about Dr Pierpont’s *Wind Turbine Syndrome*? Have you seen that?

**Mr Bailey**—I know of that academic and understand that she favours larger scale research on health effects.

**Senator FIELDING**—Do you know whether that was part of the considerations in setting up the guidelines?

**Mr Bailey**—I will ask my colleague Mr Tonna to answer that question, because he was involved in that process more than I.

**Mr Tonna**—The guidelines draw on the work of the National Health and Medical Research Council in regard to the health impacts of wind farms. We are aware that the work examined the work of Dr Pierpont. The work in developing the guidelines with the states and territories did not explore that directly; rather it referred to work of the National Health and Medical Research Council.

**Senator FIELDING**—I have had a look at the National Wind Farm Development Guidelines and, frankly, there is more concern about bats and wind flicker than there is about other health issues in regard to wind turbine syndrome in that whole report. I was surprised when I read it how much was focused on other issues—road widenings and all sorts of things—and not much about people’s health.

**Mr Bailey**—At the time those guidelines were developed it was absolutely a collaborative effort with the states. I think the guidelines reflect the profile of issues felt to be important at the time.

**Senator CAROL BROWN**—I know you have talked about the discussions with the states and territories, but are you able to take us through the process that led to the areas that you looked at in terms of these guidelines? You have listed community and stakeholder consultation,

wind turbine noise, visual and landscape impacts, birds and bats, shadow flicker, and electromagnetic interference. Is that the full list?

**Mr Bailey**—I will ask Mr Tonna to field that question.

**Mr Tonna**—The process for arriving at the eventual scope of the National Wind Farm Guidelines arose from a report that was commissioned by the Environment Protection and Heritage Council of COAG, and that report was delivered to the Environment Protection and Heritage Council in November 2008. The report was to look at the social and environmental impacts of wind farm developments. That report was developed by a working group of state and territory officials, supported by a stakeholder reference group. The report concluded that the assessment and approval processes in jurisdictions were generally robust and working well and that many issues identified in the report were being adequately addressed by existing procedures. However, it identified and categorised a list of areas where there was scope for further work on methodologies. Rather than proposing approaches to set limits or other regulatory aspects, it looked at the particular methodologies that we use to assess some of the technical aspects that were not covered by other regulations within the states and territories.

Obviously there are a number of aspects of the development that are common to all developments and not just wind farms, and those were considered to be well addressed, but there were some specific aspects relating to wind farms that, while the jurisdictional processes were robust, additional methodologies would assist. That is what led to the list of areas for development in the National Wind Farm Development Guidelines as specific areas. There are two categories of areas mentioned in the guidelines. There are those for which a subsequent methodology is developed and there are those that are assessed as being significant but not requiring a detailed methodology within the guidelines.

**Senator BOYCE**—I would like to follow up on that. You pointed out that the guidelines set out a list of best practice methods. Do you assess how close to best practice wind farm developers perform?

**Mr Tonna**—During the assessment processes conducted within jurisdictions there is a stage where the jurisdiction planning authority considers the development proposal before it. They are able to draw on a range of resources in conducting that assessment, and the methodologies provided in the guidelines are there to provide a methodology that they can draw on to conduct that assessment.

**Mr Bailey**—The Department of Climate Change does not have as part of its responsibilities in this area the checking up of developments. The approval process sits in every case at the state level. Our contribution to that is chairing the process for the development of the guidelines in an effort to get best practice and reasonably uniform approval processes. The power is always with the states.

**Senator BOYCE**—You would have no way of percolating up, so to speak, how well developers are conforming to these guidelines?

**Mr Bailey**—That is correct. We do not look at that issue. That is a state issue.

**Senator BOYCE**—Thank you.

**Senator CAROL BROWN**—Was there any community consultation?

**Mr Tonna**—In the process of developing the guidelines an initial draft was developed. That was released for public comment with over 70 submissions received. Also, a stakeholder reference group was consulted, which contained stakeholders from both the wind industry and some local community groups. The working group made significant changes to the guidelines and those significantly changed guidelines were progressed to the Environment Protection and Heritage Council of COAG.

**Senator CAROL BROWN**—Thank you.

**CHAIR**—Senator Fielding.

**Senator FIELDING**—Many submitters have argued that the siting of wind farms is too close to residential areas or people living close by. What is in the guidelines about the minimum setback and distance in regard to being near a wind turbine?

**Mr Bailey**—Mr Tonna may be able to add some more detail to this. The guidelines take a risk based approach, which specifically acknowledges that different wind farms will have different considerations in regard to setbacks. It depends upon topology and city versus rural. There is no mandatory national standard on setbacks.

**Mr Tonna**—Just to reinforce that, the guidelines recognise that different layouts of wind farms would have different degrees of impact and also different wind turbine or blade technologies might have different impacts at different distances. The guidelines take the risk approach that the impacts should be measured and then decisions made.

**Senator FIELDING**—Has the department done any work in this area? For example, if there was a minimum setback of, say, five kilometres on a wind turbine from any residents living nearby, what impact would that have on the size of the market for wind energy in Australia?

**Mr Bailey**—I do not think that is a matter that we have looked at.

**Senator FIELDING**—That is an important consideration. The concern that I have is that there is a lot of momentum behind wind energy. I am not going into whether the renewable energy targets are right or wrong, but it is obviously quite a sizeable business and there are good incentives to go down that market. It is going to be an even bigger business. I am worried that there is not enough being done in regard to looking at minimum setbacks. I am interested to know if you had minimum setbacks of, say, five kilometres—some may argue less, but say it was that level—what impact would that have on the market of being able to put wind turbines in? I am interested to know what it will do.

**Mr Bailey**—Arguing from first principles, the bigger any setback the more difficult it will be to find wind sites that comply with that.

**Senator FIELDING**—I can well imagine that the industry will be fighting against those minimum setbacks.

**Mr Bailey**—I do not know the view of industry on that. I would come back, though, to the way the guidelines were set. This issue was looked at quite closely and in the consultation document that preceded the guidelines the view was taken that state approval and assessment processes were working well. That would lead us to take the default view, which is reflected in the guidelines, that the issue of setback should be judged on a site-by-site basis, because it will depend upon some quite specific factors that Mr Tonna mentioned.

**Senator FIELDING**—Has the department been in touch with residents who live in close proximity to wind farms?

**Mr Bailey**—We have not proactively done that. We would regard that as an issue for the states because they have the responsibility for the relevant planning processes. We have received a small amount of correspondence on the matter, but that is it.

**Senator FIELDING**—What have you done with that correspondence?

**Mr Bailey**—We would have replied to them. The figure that I have in my head is that in 2010 we received nine letters across the whole year relating to wind farm health effects. Other departments may have received correspondence, but I am not aware of that.

**Senator FIELDING**—Thank you.

**CHAIR**—Senator Adams, do you have any questions?

**Senator ADAMS**—Yes, I do. I would like to ask a question about the cost of wind farm development. You said earlier that it was one of the cheaper means of renewable energy. Are there any government subsidies available to wind farm developers?

**Mr Bailey**—Yes, there are. That goes to the mechanism that was set up within the renewable energy target. Under the target, renewable energy's generation is associated with the creation of a renewal energy certificate. One megawatt hour gives rise to one certificate and then those certificates can be sold. The subsidy for renewable energy is centred on the sale of those certificates. That is one side of it. The other part of the renewable energy target is that it places an obligation on individuals, and most importantly energy retailers, to be purchasing a certain amount of renewable energy. Retailers and people like AGL and others fulfil their obligation by purchasing certificates. It is a market based mechanism and the market sets the price.

**Senator ADAMS**—In comparison with, say, solar where does wind sit?

**Mr Bailey**—In what respect?

**Senator ADAMS**—As far as the renewable energy commodity and just the cost? I am trying to get an idea of the cost of wind versus other renewable energies.

**Mr Bailey**—I do not have an easy answer for that, because it turns out that it is a complex question. The way that we would think about this is: what is the cost of power that is being sold into the national energy market? You would really be best to go to the experts, such as the Australian Energy Market Operator, because they could give you that information. Power is generated and sold into the grid on quite short timeframes. As to the issue of cost, we can look at issues like that with the concept called the levelised cost, which is the cost of a megawatt taken over the life of a power infrastructure, such as a wind farm or a coal fired power station, and that gives you a sense of average costs. Based on those calculations we know that wind is more expensive than, say, coal but it is also one of the cheaper forms of renewable so it is certainly efficient in that category of renewable energies. The question on the actual cost of wind, as it is supplied into the national electricity market, would be better presented to the Australian Energy Market Operator, because they would have that data, more so than this department.

**Senator CAROL BROWN**—Are you aware of Australian research into health impacts?

**Mr Bailey**—Yes. I believe the National Health and Medical Research Council have done a study into the health issues associated with wind farms.

**Senator CAROL BROWN**—Are you aware of any other Australian research?

**Mr Tonna**—No. The National Health and Medical Research Council work was a literature review of available literature. I cannot recall whether that dealt with any specific Australian primary research on the subject. It may do so. As that is not our area of direct expertise and involvement, I am not across the detail of which particular research they consulted in doing that particular review.

**Senator CAROL BROWN**—Are you able to tell us basically what they found?

**Mr Tonna**—Yes. If you bear with me for a moment I can read out to you their primary conclusion.

**Senator CAROL BROWN**—Of course.

**Mr Tonna**—The primary finding of that National Health and Medical Research Council review is:

There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines.

**Senator CAROL BROWN**—Thank you.

**Senator FIELDING**—From my understanding it was a rapid review. It was not thorough at all. The word ‘rapid’ is rapid. I have been through the report. I have actually looked at it. Given the level of concern there is I think we need more than a rapid review. Who is responsible for looking at the adverse health effects of wind farms? Who is accountable? Where does someone go and who is responsible for looking at that issue?

**Mr Bailey**—Ultimately one has to go to each state government and their relevant planning body, because they have responsibility for the planning and approval process.

**Senator FIELDING**—That is the biggest issue. There are studies done and in this committee a lot of submissions have come through on the adverse health effects. We are trying to find out where people go with those concerns and where they raise them. Rather than a rapid review we actually need an exhaustive, in-depth worldwide review to start to look at not just wind shadow but what I was talking about before with the issues of the wind turbine syndrome.

**Mr Bailey**—I would go back to where we are in the finalisation of these non-mandatory guidelines. They are in fact in the middle of a consultation process that is running for about a year. We are just over halfway. I would expect that if groups have significant concerns they raise them at the state level, because that will feed into the finalisation of commentary on the draft guidelines and their finalisation.

**Senator FIELDING**—Looking at what we have here, I am not sure I would like to live close by to one. I do not know anyone in any sort of senior positions anywhere who does lives near one, by the way. I have no further questions.

**Senator CAROL BROWN**—I would like to follow on from that. You mentioned earlier that in 2010 you received nine pieces of correspondence with concerns about health impacts. Is that correct?

**Mr Bailey**—Yes, in this department.

**Senator CAROL BROWN**—In the discussions that you had with the states and territories or the group that feeds into the draft guidelines do you know of any other substantial concern that has been raised by members of the public to states and territories?

**Mr Bailey**—I will ask Mr Tonna to respond to that, because he was involved in the development of the guidelines and all of that work. I would emphasise that there was a lot of attention paid to the health issues at the time.

**Mr Tonna**—We are aware that people have made representations to state and territory governments about health impacts and we were exposed to some of those representations during the consultation process in the development of the guidelines. The focus of the guidelines, particularly on noise, looked at the available evidence in relation to the noise impacts of wind turbines, and that is what shaped the material that appears in the guidelines regarding those characteristics.

**Senator CAROL BROWN**—Do we know how many people live in close proximity to wind farms in Australia?

**Mr Bailey**—I do not have that information.

**Senator FIELDING**—Are you responsible for the National Wind Farm Development Guidelines?

**Mr Bailey**—Yes. Our role was really to be the chair of the process. I will emphasise that this was not a Commonwealth-only exercise, it was a genuinely collaborate exercise with the states, and their involvement was essential because ultimately they have the jurisdictional authority to make these planning decisions.

**Senator CAROL BROWN**—It came out of COAG?

**Mr Bailey**—That is right.

**Senator FIELDING**—What is the status of these guidelines?

**Mr Bailey**—The guidelines were released for comment in July 2010, and I believe it is a 12-month consultation process.

**Senator FIELDING**—The consultation process is still going on, so if people still want to submit to that they would have until July 2011; is that correct?

**Mr Tonna**—As Mr Bailey previously indicated, the process for making comments into the guidelines is to be done through the jurisdictions, the states and territories who are collating information on the guidelines. Given that there was previously a public consultation process that was more general and directly focussed back on the working group, the current draft release of the guidelines is primarily designed to allow jurisdictions to assess how the guidelines will work in the context of their planning provisions and, through their interactions with normal stakeholders, gain further input as to how the guidelines will operate and what the capabilities of those guidelines are.

It is not an open public consultation process in terms of the fact that a central repository of submissions will be received, but we expect that the states and territories, through their engagement with key stakeholders, will gain an opinion of how the guidelines could work in their jurisdiction. Some of the jurisdictions have conducted consultation sessions about the draft guidelines with key stakeholders, and that kind of information will ultimately be collated in terms of a recommendation to the Environment Protection and Heritage Council, or the relevant COAG ministerial council, for a decision about the draft status when it comes to an end at around the middle of 2011.

**Senator FIELDING**—So, for anyone listening to these hearings across Australia who wanted to have a say about the National Wind Farm Development Guidelines, what do they do?

**Mr Tonna**—As Mr Bailey has previously indicated, they could contact their relevant state and territory authority and make approaches through them.

**Senator FIELDING**—Could you provide a list of those? You are already dealing with them. Could you provide a list and some contact details?

**Mr Bailey**—We can take that on notice and provide that.

**CHAIR**—Any other questions?

**Senator ADAMS**—I have. The officials at the table keep referring back to the states. What is your role? I can see everything that you have said has to go back to the state for their guidelines, and yet you are going to have this national guideline. Can you give us a better definition, now that we have had this discussion, on exactly what your role is?

**Mr Bailey**—Let me see if I can put it in the context of the renewables energy area. When the renewables energy target was set in 2010 it was clear that with a much higher target there would be more development of renewable energy from various sources, and wind farms prominently amongst those. The thinking at COAG was how we get better uniformity across all the states so that, while there is still scope for each state to make the planning decisions that it feels most appropriate, we can give the wind farm industry greater certainty and greater uniformity of regulatory approach. The idea behind the guidelines was, without overriding states' regulations, to set out what the collective states and Commonwealth believe to be best practice in each of the constituent parts of the regulations and then use that in a non-mandatory way to have states, as best they could, achieve greater uniformity in their approach to assessing the sorts of issues that we have been talking about this morning.

The Department of Climate Change and Energy Efficiency's role in that was really to chair the consultation process and the development of the guidelines. That is where our responsibility starts and finishes. We do not get involved in trying to make representations to states about particular planning matters. That is their jurisdiction and we stay out of it.

**Senator ADAMS**—So, if they are having problems with developers in the way that they are going about things or anything like that, you would not get involved with any of that? Is that still the states' problem?

**Mr Bailey**—As far as I am aware, I think the states feel comfortable about executing on their own regulatory processes. If they wish to consult us on specific issues, we would be happy to help where we could.

**CHAIR**—It is the same situation for any development, I would presume. If there is a development in a state that impacts on national legislation, for example, the Environmental Protection and Biodiversity Conservation Act, it would go off for assessment in the same way that any other development—a coal fired power station, a gas development or a road development—would go off? I presume wind farms are no different from any other development.

**Mr Bailey**—That is correct. There have been a number of wind farm developments that have been looked at.

**CHAIR**—We are aware of some famous ones. Senator Adams, do you have any more questions on clarifying the role?

**Senator ADAMS**—Not on the role.

**CHAIR**—Do you have more questions?

**Senator ADAMS**—Yes, I do have another one. Have you done any work on emissions from wind farms and with the backload, when the wind stops, especially in some areas where they need to use diesel?

**Mr Bailey**—Wind power is close to being a zero emission source of power. The debate, as far as I am aware, has been more around when wind power gets contributed to the national grid and whether there is a one-for-one saving in emissions from the power that wind power displaced on the grid for the period that power was going on to the grid from that particular source. That is a topic of debate. I think it is a complex area. Our understanding of the matter is that, yes, there are significant savings in emissions. But if you wanted to explore that issue further, it becomes quite technical very quickly. I think it would be better to approach the Australian Energy Market Operator.

It comes down to quite specific questions around, say, when power comes on to the grid from the wind farm, what was the source of power that the wind energy displaced? Different sources will employ different technologies and each of those technologies will have different emissions characteristics. There has been a debate about whether back-up energy needs to be continually running because of the intermittent nature of wind power. We believe that is not the case, but again I would encourage you to take those more detailed questions to the Australian Energy Market Operator.

**Senator ADAMS**—The other part is the emissions. We have had some evidence about the actual building of the towers and also the manufacture of the towers. Is that calculated as well?

**Mr Tonna**—We have seen some studies into that. From what we have seen, as I recall, there was a relatively quick payback, if you like, of those emissions during the operation of the wind turbine. In a relatively short space of time the renewal energy generated by the turbine had offset those emissions used in its construction. I do not have the details in front of me of how long that might be. I am happy to establish what those sources are.

**Senator BOYCE**—A life-cycle assessment, if there has been one done.

**Mr Tonna**—That is right. There have been life-cycle assessments done.

**Senator BOYCE**—What is the average life of a wind turbine, as a matter of interest?

**Mr Tonna**—I forget what the guidelines say.

**Senator BOYCE**—Perhaps we could ask the manufacturers.

**Mr Tonna**—Yes.

**CHAIR**—Presumably you have done life-cycle analyses of other sources of energy generation as well—solar, wind, coal fired power stations and so on.

**Mr Tonna**—Yes. The *Australian energy resource assessment* report looks at the levelised costs and the life cycles of a number of these.

**CHAIR**—We will have a look at that. I understand Senator Fielding has one last question. Senator Adams, have you finished?

**Senator ADAMS**—Yes.

**CHAIR**—Senator Fielding.

**Senator FIELDING**—Returning to the National Wind Farm Development Guidelines, they are yours, are they not? You actually won them?

**Mr Bailey**—We have responsibility for their development, but we would regard them ultimately as a COAG document equally shared by ourselves and the states.

**Senator FIELDING**—I understand the states do feedback, but I think someone should be doing feedback on the total document, the total guidelines, nationally. Does that make sense? It worries me that you are basically just the collator. I am sorry for putting words in your mouth, but I worry about that a fair bit. There needs to be ownership of this stuff. If you folks own it, you are producing it, then I think before they are finalised there should be consultation on the document before it becomes final. You are relying on the states. I think it is a national document and that you folks should be doing consultations publicly on those guidelines.

**Mr Bailey**—I will ask Mr Tonna to address the question of the process that we are following.

**Mr Tonna**—To be very clear about the ownership, the guidelines are owned by what was formerly referred to as the Environment Protection and Heritage Council of COAG, and the working group that developed the guidelines was reporting to EPHC. They are the owners of the guidelines. In considering how to respond to the draft guidelines that were presented to that council by the working group, the council considered the fact that a public consultation had relatively recently been conducted, which received a very wide and full range of views. It is my understanding that the EPHC had a good understanding of what the public views were on the issues and that it did not require a subsequent full public consultation to be conducted on the draft that was released as an interim document to enable an assessment to be made of its applicability within the different jurisdictions. We will work closely with the states and territories to collate their feedback on the draft guidelines as they have been released. We will play an active role in pulling together their comments. I think we have made it clear this morning that the actual hands-on responsibility for assessing wind farm developments rests with the states and territories and they have the expertise in that respect.

**Senator FIELDING**—What role do you play in the development of these guidelines?

**Mr Tonna**—Our role is chair of the working group that was commissioned by the EPHC to develop the guidelines.

**Senator FIELDING**—That is correct. So, why would you not, as the chair, make sure that once you have your final draft done, recheck with the public and other interested groups, to make sure these guidelines have had proper consultation, rather than just saying it is a bottom-up process?

**Mr Tonna**—I think that is a decision for the EPHC. When you talk about the ownership of the guidelines, they own the guidelines, so that would be a decision for them.

**Senator FIELDING**—Why are you involved if you are not going to own them?

**Mr Tonna**—We coordinate the work.

**CHAIR**—I think that you are now at a point where the department cannot answer, because they are doing work for another body. As I understand it, they are not the body that owns them, it is the council. I think you are not going to get any further in re-asking the same question.

**Senator BOYCE**—Just call COAG as a witness.

**Mr Bailey**—I agree with your comments, but I would emphasise that we want to be respectful of the role of the states in this matter. They are the approval authorities. Therefore, they have the expertise to make these decisions and to take on board the sorts of concerns that you are pointing to.

**Senator FIELDING**—The point I was trying to make is that they are a collection. As the national part of it, I would like to believe that those national guidelines, in themselves in totality, when they have been finalised, have gone through a rigorous public consultation process. I am trying to work out who should be doing that. You are playing a role and I thought that you had produced them, albeit relying on everybody else's information. I would have thought that you folk would have done the public consultations when they were finalised.

**Mr Bailey**—I come back to the original report that gave rise to these guidelines. That was a very rigorous process. As Mr Tonna mentioned, it involved extensive public consultation and extensive use of experts, including on health effects, and it is a relatively recent piece of work.

**CHAIR**—Can you remind me of when that was?

**Mr Bailey**—That impediments report was released in November 2008.

**Senator FIELDING**—Following this inquiry, I am wondering whether a review could be done of those guidelines. I do not want to pre-empt anything.

**CHAIR**—Yes, you are. You are going to pre-empt what the committee may decide to put in its report. With all due respect, I think we have gone far enough. I do not think that you will get anything from the department on that. Is this a special process the council has done? When they do guidelines and things like that for other things, do they do the same process or is there something different between what has happened with this process and what has happened with any other process the council has done?

**Mr Bailey**—The process of consultation in the formation of guidelines is quite standard. Mr Tonna might have some more details.

**Mr Tonna**—I am not that familiar with the broader work of the Environment Protection and Heritage Council. As I am aware, this is the only aspect of that council's work that has been

taken on by this department. From my very loose understanding, it is consistent with the processes used by EPHC for its other work.

**CHAIR**—We may clarify what other processes have been undertaken to see whether this is different for some reason from other work that it has done. Would that help, Senator Fielding?

**Senator FIELDING**—Yes.

**CHAIR**—Are there any other final questions?

**Senator FIELDING**—It might help, but it might not allay my concerns.

**CHAIR**—Yes, I take that point. Thank you very much for your evidence. I think Senator Adams gave you some homework.

[9.53 am]

**PIERPONT, Dr Nina, Private capacity**

*Evidence was taken via teleconference—*

**CHAIR**—I welcome Dr Nina Pierpont, who is on line from the USA.

**Dr Pierpont**—Yes, I am here.

**CHAIR**—Good morning—or good morning our time, Dr Pierpont.

**Dr Pierpont**—I have a question—I hate to interrupt—but may I record this?

**CHAIR**—Yes, these are public proceedings, so there is no problem with that.

**Dr Pierpont**—Okay.

**CHAIR**—Information on parliamentary privilege and the protection of witnesses and evidence has been provided to you, but please also note that, while witnesses appearing before and evidence given to Senate inquiries is protected by parliamentary privilege, this protection extends only to Australia. You should therefore be aware of the limitation of this protection.

**Dr Pierpont**—Okay. Thank you.

**CHAIR**—We have your submission. Before I invite you to make an opening statement, I will just clarify for you who is in the room, and also that the Senate is still sitting at the moment because it has been extended. We were not expecting this. Therefore, senators may be called to attend voting in the chamber. You will hear the bells go. We will let you know that we are leaving, and we will probably be away for about five minutes, and then we will come back. I apologise for that, but there is nothing we can do about that.

**Dr Pierpont**—That is fine.

**CHAIR**—I invite you to make an opening statement, and then we will ask you some questions.

**Dr Pierpont**—Thank you. I have an MD from Johns Hopkins University, a PhD in Population Biology from Princeton University, and a Bachelor of Biology from Yale University. I am a board certified paediatrician and a fellow of the American Academy of Paediatrics, and I practise paediatrics and behaviour medicine in rural northern New York State. I am the author of *Wind Turbine Syndrome*, a report on a natural experiment, published in November 2009. Thank you for inviting me to testify today.

Wind turbine syndrome is a uniform collection of signs and symptoms experienced by a significant proportion of people living near large wind turbines. The symptoms include sleeplessness, headaches, nausea, dizziness, tinnitus, ear pressure and pain, eye pressure and pain, episodes of alarm and panic awakening people from sleep with physical symptoms of an adrenalin surge, like pounding heart, frequent night-time urination and enuresis, and problems with cognition and performance, including difficulty reading, loss of short-term memory and concentration, and deficits in spatial memory and problem solving. The signs or physical symptoms include elevated blood pressure. This collection of symptoms, including the cognitive problems, is well known to ear, nose and throat doctors who specialise in balance or inner ear vestibular problems. It is also well known to physicists who have worked with low-frequency noise and infrasound in military, naval and space program settings.

The association of noise and night noise with learning problems in children and with blood pressure elevation and increased cardiovascular risk is well known to many scientists who have studied the effects of noise in large European epidemiologic studies, and well known to the World Health Organisation, which has published guidance on community noise and on night noise in the last 12 years. Experimental studies in the United States and elsewhere are producing new evidence on the physiological effects of infrasound and low-frequency noise on the inner ear, establishing the links in the physiologic chain from the turbine produced low-frequency noise and infrasound to effects on the human brain and body.

Studies to date of wind turbine syndrome effects specifically include my case crossover study and several theories of cases in Australia, the United Kingdom and in Ontario, Canada. More studies are needed, but substantial caution is warranted while these studies around existing wind farms are carried out. There are specific government actions that could be taken both to protect the citizenry and to make large-scale epidemiologic studies feasible. Australia is an excellent place for these studies to be undertaken. You have lots of turbines and lots of affected people, and a superb leader in Dr Sarah Laurie, who has already taken the study of wind turbine syndrome beyond my focus, which was the symptoms of inner ear disturbance and associated panic, and my focus too on who was susceptible out of the population. Dr Laurie is gathering information on the physical manifestations, such as elevated blood pressure, hypertensive crises, and heart attacks without evidence of coronary artery disease.

**CHAIR**—Thank you.

**Senator FIELDING**—Thank you, Dr Pierpont. As I am going to do with each of the witnesses, I am going to play the other side for the moment, because it is important that we get both sides of the issue. I will ask a provocative question to start with. If wind turbine syndrome is real, why is it that there are people living near wind farms who are not affected at all or suffer any of the symptoms you claim to exist?

**Dr Pierpont**—Because there is variability and susceptibility to the probable cause, which is the low-frequency noise and infrasound. That in fact was the focus of my study. In studying 10 families who had to move away from wind turbines because of their symptoms, I used their case crossover format where I interview people in detail on their symptoms and their health status before there were any turbines, during the times when the turbines were there, and after they left, and these people came and went away frequent times until they had figured out themselves that it was the turbines that were causing their problems.

The focus of my study was susceptibility, that is, who was susceptible? In all the families I interviewed in detail all of the people either through their parents if they were young children or the adults themselves and older teens. I had clusters of people, some of whom were more strongly affected than others, and then I could correlate those affected with particular symptoms with factors in their own baseline health status.

Three areas of susceptibility emerged from my study. One is people with migraine disorder, and that comprises about 12 per cent of the North American, Australian or European population. About 6 per cent of men and about 18 per cent of women have migraine disorder—a highly heritable neurologic syndrome. People with migraine disorder are highly susceptible, especially those with motion sensitivity. Motion sensitivity and dizziness and fear of heights, a tendency towards nausea during headaches, are all common, standard parts of migraine disorder. People with motion sensitivity also stood out in my study as being particularly susceptible to one part of the symptom complex, which is the night-time panic episodes, waking from sleep with beating heart, a feeling that someone had just broken into the house and unable to go back to sleep for hours because of the adrenalin surge.

Basically, the fight or flight response is triggered by disturbance of the vestibular system. So, people with migraine disorder, people with motion sensitivity, and the third group that emerged was people with pre-existing damage to their inner ear. These were people with industrial noise exposure—farmers and fishermen. People who had worked in factories and industrial settings in my study were more susceptible, say, than their spouses who had not worked in those settings. People who had had chemotherapy that damaged the inner ear, such as one subject I had who had had breast cancer, with a typical set of chemotherapy that damages some of the fine cellular level inner ear structures. Those were the three susceptibility groups I came up with by looking at pre-existing medical conditions.

Also, my selection process was that I chose families with people who had been made quite ill, so much that they had to abandon their homes. People do not abandon their homes easily. That really goes without saying. The people in my study were, as I said, farmers, fishermen, factory workers, and one physician and his wife, a nurse.

As to the other thing that emerged—when I selected for affected people in this study, then I could compare the kind of distribution of, say, age or of the prevalence of certain underlying conditions in my population versus the general population, and I had an overrepresentation of people in their 50s. It looks to me as though age is also a risk factor, and that makes a lot of sense, given that vestibular or balance function becomes more precarious with age. The inner ear organs, both the cochlea for hearing becomes more troubled, and also people's balance becomes more troubled with age. I also found problems in young children specifically, and fewer problems in the mid-range—teens to 20s.

So, there are distinct patterns of susceptibility to these problems. In terms of estimating how many people will be affected out of a population, for that an epidemiologic study is needed. But, frankly, an epidemiologic study is impossible because of the gag clauses that are standard in Australia, the United States and Canada that prohibit people from talking about any complaints or adverse effects or adverse thoughts about the wind turbines if they have signed a contract, either a lease agreement or what is called here a neighbour agreement, to receive money from the wind companies. That is something where some legislation would really be helpful, in

getting rid of or invalidating those gag clauses. If, as the wind industry says, there are no problems with health, there is really no reason for the gag clauses.

**Senator FIELDING**—Thank you for that. That would explain why some people have adverse health effects and some have not. You may or may not be aware, but the Australian Government's National Health and Medical Research Council last year said there were no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following planning guidelines. There are no minimum setbacks from wind farms in Australia. I notice that you state in your submission, 'The evidence for turbines producing substantial low-frequency noise and infrasound is no longer in dispute.' And further, 'That it is unambiguous that low-frequency noise and infrasound profoundly disturb the body's organs and balance motion and position sense.' If you do not have like a minimum setback from a wind farm turbine, how can you say there are no direct pathological effects from wind farms?

**Dr Pierpont**—I do not quite understand the question.

**Senator FIELDING**—An Australian government body, the National Health and Medical Research Council, stated last year, 'There are no direct pathological effects from wind farms.' We do not have any minimum setback standards.

**Dr Pierpont**—Part of the issue is that that is not true. This document by your National Health and Medical Research Council, *Wind turbines and health: a rapid review of the evidence*, is a really pitiful and dubious document, and I have just reviewed it. It has also been reviewed by Dr Robert McMurtry in Canada, a dean at a medical school. I am also a PhD scientist, and I know about evidence. The sources used in this document are mostly government sources and other non-scientific, non-peer reviewed sources, and of the peer reviewed sources they cite, one of them I know well, which is the Pederson and Persson Waye, and they misused their information. Another source, Leventhall 2006—Leventhall has been engaged and employed by the wind industry for many years.

**CHAIR**—Dr Piermont, unfortunately the bells in the chamber have just started ringing, so we have to go and vote. We will be approximately five minutes. I apologise, but as I said earlier, there is nothing we can do about it.

**Dr Pierpont**—Okay.

#### **Proceedings suspended from 10.10 am to 10.20 am**

**CHAIR**—We will resume. Dr Pierpont, I think you were halfway through finishing an answer.

**Dr Pierpont**—I have a few more comments about this National Health and Medical Research Council document. Many of the sources it cites are also direct wind industry documents, from the American and Canadian Wind Energy Association and the Australian Wind Energy Association. These are not independent sources, these are industry documents. This is not scientific critique. There is an obvious conflict of interest in what these documents and people have to say.

I do not know whether anyone there has the ability to go online, but if you go on the site of the National Institute of Health in the United States, the section that is called the National Institute on Deafness and other Communication Disorders, the lead article on that website is about research by a lab scientist, Dr Alec Salt, at the Washington University School of Medicine, who has published in 2010 and is continuing to work on experimental evidence on the effects of low-frequency sound and infrasound on the inner ear and on the cells of the inner ear. You will see a quite different approach to science on that website actually referring to real scientific articles. They take quite a different view on the physiologic effects of infrasound and the potential effects of proximity to wind turbines on human health.

**Senator FIELDING**—It is a very important issue, because a lot of the time when people raise concerns about the adverse health effects the counterclaim is made that the National Health and Medical Research Council last year found that there is not a problem. I will be very keen, as a follow-up, to know if you could provide a supplementary statement on some of the issues you raised around the National Health and Medical Research Council document.

**Dr Pierpont**—I would be happy to do that.

**Senator FIELDING**—That would be very good. The National Health and Medical Research Council paper sets out a comparison of noise produced by a 10-turbine wind farm compared with other noise levels. The jet aircraft at 250 metres was 105 decibels. The noise level in a busy office was 60 decibels. A car travelling at 64 kilometres per hour over 100 metres was 55 decibels. A wind farm with 10 turbines at 350 metres is 35 to 45 decibels. A quiet bedroom is at 35 decibels. Background noise in a rural area at night is 20 to 40 decibels. Given that this information is put out by the National Health and Medical Research Council I assume it to show that wind farms are fine; that the noise level is nearly the same as that in a quiet bedroom. What are your thoughts on that view?

**Dr Pierpont**—Firstly, if you look at the graph, it says dBA—and an A weighting. Noise comes in many different frequencies. When you take a decibel reading, it is reduced to one number for loudness. The way this is done is that the microphones in the recording systems have different what are called weighting networks. To answer fully, I am going to look at Dr Salt's website, because he has beautiful graphs of this—Dr Alec Salt of the Cochlea Fluid Research Laboratory at Washington University.

**Senator FIELDING**—You may want to provide that. I would appreciate further information from you on this for the committee to look at.

**Dr Pierpont**—Okay.

**Senator FIELDING**—The issue is that basically wind farms are safe and sound because the decibels are at 35?

**Dr Pierpont**—The issue is that it cuts out all the low-frequency noises. It really cuts them out, like, by a factor of over a million.

**Senator FIELDING**—So, what you are saying is that you have to look at those low-frequency noises, correct?

**Dr Pierpont**—That is right. If you screen out all of those noises, the number you are left with is 35 to 45, but that is not where it is making noise.

**Senator FIELDING**—So, what you are saying is that even though the decibel measure looks like the wind farms do not have any impact, they have not considered their low frequency?

**Dr Pierpont**—That is right, the dBA measure. There are other weighting networks that let in more of the low-frequency noise and add it to that one number; dBG really picks up low-frequency noise; dBC picks up more of it. The best way to measure low-frequency noise is with highly specialised equipment that is just not commonly available and does not have weighting networks at all. In those cases, the noise that is being measured is displayed as a graph with different levels at different frequencies.

**Senator FIELDING**—Given that we do not have the graphs here, could you provide that documentation in your follow-up to the previous information on the National Health and Medical Research Council?

**Dr Pierpont**—Okay.

**Senator ADAMS**—I have read your book, and as I have a nursing background I really enjoyed what you wrote. A lot of criticism has been directed at you and the fact that your work is not peer reviewed. Have you been able to achieve a peer review on *Wind Turbine Syndrome*?

**Dr Pierpont**—I would like to read you the names of the peer reviewers whose commentary is actually published right in the book, which you may have seen.

**Senator ADAMS**—Yes.

**Dr Pierpont**—The book process went way beyond the usual book process for peer review. In fact, the process of peer review that this book went through was validated on the third page of the book by one of the commentators, Jack Goellner, who is the Director Emeritus, Johns Hopkins University Press. He described it as follows: ‘Dr Pierpont has written a superb and powerful book, truly first rate in its presentation of hard data and with remarkable clarity. I devoutly hope that her findings, pinned as they are to unassailable research and rigorously peer reviewed by ranking scientists, comes to the attention of movers and shakers.’ So, this is the man who supervised the publication of both journals and academic and medical literature at Johns Hopkins University Press for over 30 years, and trained multiple United States University Press directors, including the current director of Harvard University Press. So, he says it was peer reviewed.

People who wrote extended comments, that are called referee reports, and these appear in the back of the book, starting on page 287, and include the following: Jerome Haller, who is a retired professor of neurology and paediatrics at Albany Medical College in New York State; Joel Lehrer, who is a clinical professor of otolaryngology at the University of Medicine and Dentistry of New Jersey; a former professor of otolaryngology at Mount Sinai School of Medicine in New York; Ralph Katz, who is a fellow of the American College of Epidemiology, professor and chair of the Department of Epidemiology and Health Promotion at New York University College of Dentistry; and Henry Horn, who is Professor of Ecology and Evolutionary

Biology at Princeton University. These are my peer reviewers. I had additional commentary from Robert May, Professor Lord May of Oxford, President of the Royal Society of London from 2000 to 2005. He remarked that it was impressive, interesting and important, though he did not offer a full review. A commentary as well from F. Owen Black, who is Senior Scientist and Director of Neuro-Otology Research at the Legacy Health System in Portland, Oregon, who is a well-known balance specialist and also works extensively with the US Military and Space Program. His comment reads:

Dr Pierpont has clinically defined a new group of human subjects who respond to low frequency relatively high amplitude forces acting upon the sensory and other body systems. Her rigorous clinical observations are consistent with reports of the deleterious effects of infrasound on humans, including but not limited to the low frequency sonar effects on divers.

He goes on, and several more academic medical doctors provide commentary in the book. This is a peer reviewed book. It was too long a study to submit to a journal. I chose to include my raw data, which is the extensive tables in the middle of the book presenting each individual's before, during and after symptoms, divided by organ system. I wanted that to be available to people so that they could actually read the real information of what these people experienced and also see the raw data, rather than just my analysis of it. Since I also wanted it to be accessible to non-specialists, I also wrote the paper in layman's language. It is a peer reviewed book, and it is referred to in at least one peer reviewed journal article. It is referred to in a paper in the journal *Hearing Research* titled 'Responses of the ear to low-frequency sounds, infrasound and wind turbines' by Alec Salt, whom I referred to earlier, a professor at the Washington University School of Medicine, and supported by the National Institute of Health.

**Senator ADAMS**—Thank you very much for that explanation. Where are you going from here? What further research are you doing?

**Dr Pierpont**—I am not doing a whole lot right now. I am doing my practice, but I have not undertaken another study, in part because what are needed are clinical large-scale epidemiologic studies and lab studies. Other people are better equipped to do these than I am.

**Senator ADAMS**—Are other people actually continuing on with the work that you have done?

**Dr Pierpont**—Dr Salt has taken up the direct physiologic mechanism part of it, and he is continuing with that. Dr Sarah Laurie there in Australia has already gone further with collecting clinical information on affected people. So, whereas I documented people's symptoms, she is documenting also their physical findings, such as blood pressure problems. I have read a summary of her work that she sent, which said that she had interviewed 60 affected people in Australia. The first 30 she interviewed before she had read my work, so she had a completely independent set of observations. She is finding all of the same symptoms and patterns, including things like the waking up frequently at night to urinate, odd things like that that are not well explained, but taking it further. I described how someone feels when they have an adrenalin surge. They have these symptoms of a panic attack. They have a rapidly beating heart. They awaken in a hyper alert state. She is actually describing the physical outcomes of having an adrenalin surge, such as hypertensive crises. There have been several instances of heart attacks

with subsequent study of the coronary arteries showing them to be clear, and this is a described phenomenon from an adrenalin surge.

What I described in my book was how you get from disturbance of the inner ear to panic attacks and adrenalin surges. That kind of medical and lab research is very well documented in the medical literature, in journal articles. So, a lot of what my book consists of, especially the clinical article, is a review of that literature making these links between what is going on presumably in the inner ear and the known linkages between the inner ear and the vestibular system and these different parts of mental, emotional and physical functioning, which can be affected by balance disturbance. The link now being made by Dr Salt is how you get from low-frequency noise specifically to how it perturbs the inner ear. The stages from the inner ear through the brain are well known, and I reviewed those in the book. Dr Laurie is now looking at what the adrenalin surges are doing physically to people. This is just really important research.

**Senator ADAMS**—As far as the recommended distance should be for people actually living close to these wind farms or to a turbine, what would you recommend?

**Dr Pierpont**—In my book I said two kilometres, because that is what my data supported. But in Australia, Dr Laurie has identified affected people out to 10 kilometres, and I know that in New Zealand there are people affected to a similar distance. It might be to do with aspects of the terrain, such as the mountainous terrain as in New Zealand, where sound can carry a long way across the cool air that settles into valleys. In dry areas, or places with less vegetation, the noise can carry further. Low frequency noise attenuates way less with distance than other forms of noise. It goes around barriers much more easily, and through barriers. I do not know whether you have the plague of boom cars in Australia that we have here, of teenagers with these really low-frequency rumbling speakers in their cars when they drive around, and you can hear the rumble and the thump when you cannot hear anything else. That is because low-frequency noise carries right through walls.

I have also explored with a physicist, Malcolm Swinbanks, who is a long-time expert on low-frequency noise and who worked with wind turbines in the 1980s, the possibilities for differences between the northern and southern hemispheres based on Coriolis forces and which directions winds veer as you go from turbine hub height up at, say, 90 or 100 metres down to the ground. In a model he worked out that it would end up that the lower tips of the blades would be moving against the wind in the southern hemisphere and with the wind in the northern hemisphere, and that could make more noise.

**CHAIR**—Dr Pierpont, I am deeply sorry; another division has been called. So we do not keep you hanging on the line, we will send you an email with the details of some further information we require. Do professional physicians in this area have a policy on this topic? We will clarify that further for you and ask that you take that on notice.

**Dr Pierpont**—I am sorry, I did not understand the question.

**CHAIR**—We have to go. We will email you around the exact nature of the question that we would like more information on. Is that okay?

**Dr Pierpont**—Yes.

**CHAIR**—Good. Thank you very much for your time.

**Dr Pierpont**—Okay.

**Proceedings suspended from 10.41 am to 11.10 am**

**ASHWORTH, Dr Peta, Group Leader, CSIRO Science into Society Group, Commonwealth Science and Industrial Research Organisation**

**HALL, Dr Nina, Social Scientist, SCIRO Science into Society Group, Commonwealth Science and Industrial Research Organisation**

**CHAIR**—I welcome officers from CSIRO to today's hearing. I apologise for keeping you waiting. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been given to you. If you need to refer to it again we can provide you with a copy. As departmental officers you will not be asked to give opinions on matters of policy, although this does not preclude us asking questions for explanations of policy or factual questions about when and how policies were adopted.

We have your submission, which is No. 579. I invite you to make an opening statement, if you care to make one, and then we will ask you some questions.

**Dr Ashworth**—Good morning and thank you for the opportunity to attend this hearing. Concerns about energy security and rising greenhouse gas emissions are driving significant change in Australia's consideration of its future energy generation portfolio. Towards this, the Australian government's renewable energy target seeks to provide 20 per cent of Australia's electricity generation from renewable energy sources by 2020. Wind has been identified as the energy generation technology most likely to fill a large component of the renewable energy target in its early years, as documented in the 2008 Environment Protection and Heritage Council report on impediments to environmentally and socially responsible wind farm development.

However, like many energy technologies, there are a number of controversies associated with wind energy. Public acceptance, for example, is seen as a critical factor for its successful deployment. Recognising this, CSIRO's energy transform flagship has been conducting research to understand the factors that may impact on wind power's acceptance and ultimate deployment. Our social research includes a desktop study of available academic literature and information, a short media analysis of articles published in the final six months of 2010 and conducting interviews to engage community members, policy makers and wind farm developers around 10 operational and proposed wind farms in New South Wales, South Australia and Victoria. We expect to publish the final report later this year.

In other research of our carbon futures theme we will be conducting a large-scale survey to understand the wider Australian public's attitudes to the range of low-emission technologies and this will also include the questions about wind.

According to our desktop review, a recent review by the National Health and Medical Research Council found no evidence that infrasound electromagnetic interference and turbine flicker and glint were harmful to health, citing the World Health Organisation, an expert panel review in North America and a study of three wind farms in Britain. It noted that health problems may be a result of stress and suggested that potential impacts could be minimised by

adhering to planning guidelines. Additionally, the NHMRC found that there is currently no evidence positively linking noise impacts with adverse health effects.

As social scientists we recognise that individuals have valid concerns around the siting of energy technologies and they need these to be heard, and this forms an integral part of our research. In our short media analysis we found there were more reasons cited for rejecting a wind farm, 32 in total, compared to 19 reasons for supporting a wind farm. Of the reasons for rejecting wind farms, landscape change and visual amenity were most often cited, followed by noise impacts from the turbines and poor consultation. Conversely, the most common cited reason for supporting rural wind farms was to reduce greenhouse gas emissions, job creation and the benefits of community owned wind farms.

It appears for wind to be successfully deployed, planning processes that are transparent and participatory from an early stage will be required. Consideration outside the topics of this inquiry will need to include attention to the importance of local contingency issues such as trust, procedural justice, place attachment and identity, as each will impact on how any wind farm proposal will be received. Like all energy technologies the process will need to be flexible, allowing time for locals to access the latest scientific information about the trade-offs for wind and to have their concerns heard and responded to in a meaningful way.

Finally, I would like to take this opportunity to correct an error I have become aware of in our submission. On page 5 in the section of health effects of wind farms we referred to a small non-peer reviewed study from New Zealand. This was incorrect. The study in question was from North America. The corrected sentence, the first in the second paragraph on page 5, should read:

A small non-peer reviewed study from North America coined the term 'wind turbine syndrome' to describe the perceived health impacts of wind turbines located within 1.5 kilometres of the homes of 10 families.

A hard copy corrected version of the submission has been provided to the committee secretariat. Thank you.

**CHAIR**—Senator Fielding.

**Senator FIELDING**—I appreciate the background because I thought the CSIRO's submission was based more on a review of media stuff, but you have given me some background of why. I must admit that I thought it would be more scientific than what I read. Has the CSIRO ever conducted thorough and proper research into the potential adverse health effects of wind farms?

**Dr Ashworth**—Not to my knowledge, no.

**Senator FIELDING**—Why is that?

**Dr Ashworth**—We do not normally do that kind of research.

**Senator FIELDING**—So the CSIRO has not done that type of research before when there has been a question mark about adverse health effects from other technology?

**CHAIR**—I have had a concern raised about the fact that we do not have a quorum. We will need to suspend until we find a senator from the ALP.

**Proceedings suspended from 11.18 am to 11.20 am**

**CHAIR**—We will resume taking evidence.

**Dr Ashworth**—I am just responding to the question about whether I am aware of any other medical research. As a general rule, my understanding is that at CSIRO we do not do medical research. We have a preventative health flagship, but I am not across how they decide priorities and I am really not familiar with other examples. I could take that on notice if there has been some of it.

**Senator FIELDING**—I think there are other technologies where you have had some say on whether there is adverse impacts on humans from technology. That is my opinion, but I am happy for you to confirm or deny that.

**Dr Ashworth**—Absolutely.

**Senator FIELDING**—Do you know what ‘rapid review’ means in research? You do a lot of research, so I assume the CSIRO would know what the term ‘rapid review’ means.

**Dr Hall**—I presume that you are referring to the title of the National Health and Medical Research Council’s document.

**Senator FIELDING**—Yes.

**Dr Hall**—That is probably an appropriate question for them for that definition.

**Senator FIELDING**—No. I am asking you what the CSIRO believes the term ‘rapid review’ means when it comes to research. I am not asking what you think the NHMRC thought; I am asking you what you think. I am not asking about the document. What would you say if someone said to you, ‘What does “rapid review” mean?’

**Dr Hall**—It is not a term that we are using in this project.

**Senator FIELDING**—No, you would not use it in a lot of your research. It seems odd to use ‘rapid review’.

**Dr Hall**—Are you speaking about this particular piece of research?

**Senator FIELDING**—Not that research at all. Has the CSIRO done rapid research before? Have they put out a document called ‘rapid review’ of this issue?

**Dr Ashworth**—Not that I am aware of. From an historical perspective I cannot really comment.

**CHAIR**—I think that is a question that we need to ask the NHMRC. I am perfectly happy with that and it is an appropriate thing to do, but asking somebody else to comment on another area of research for an opinion is pushing it a bit. The witnesses have said that they cannot comment on that. As I said, I think it is a fair question to ask the council. It is a different area of research, so perhaps that is the reason. I am conscious of time so maybe we should move on because they have answered your question.

**Senator FIELDING**—The reason I asked the question is that you use ‘rapid review’ terms in your submission, so it is relevant. That is not the main purpose. I was trying to work out, generally speaking, what ‘rapid review’ means when it comes to research. I was not necessarily saying that I wanted them to give a view on the NHMRC rapid review report. I am just generally interested in what it means. I am an engineer. I do not think I have heard of rapid review research that people keep on quoting massively to say that they are safe. Rapid review does not seem thorough to me. I wanted to know your thoughts at CSIRO. Does rapid review sound thorough to you?

**Dr Ashworth**—It is not a term that we would use, so I do not feel confident in responding.

**Senator FIELDING**—Has the CSIRO looked into wind turbine syndrome and, if so, at what detail?

**Dr Ashworth**—As part of the review and preparation when we were doing our desktop, we did a research and review of the ISI Thomson scientific database under N Pierpont, but nothing came up in the academic literature for wind turbine syndrome. We cited where it was referenced in other work, but that is as far as we went.

**Senator FIELDING**—Has the CSIRO formed a view on wind turbine syndrome in any way?

**Dr Ashworth**—From our perspective we are not medical researchers so we are not able to comment on that. We referred to the NHMRC as the guide.

**Dr Hall**—We should stress that we rely on peer reviewed research where possible, so in this available research, as Dr Ashworth referred to, we look at peer reviewed research. We searched for wind turbine syndrome and Pierpont’s work related to wind on the Web of Science, which is the largest peer review database of existing journal articles.

**Senator FIELDING**—The reason why I am asking these questions is that there are quite a few people within the industry who keep on referring back to that NHMRC paper as the reason why it is safe. ‘Don’t worry about wind turbines and living too close to them, they are safe.’ What I am asking is whether the CSIRO has done any work in that area with the desktop review? So there is no detailed scientific study on it, is there, from the CSIRO?

**Dr Ashworth**—On the health effects?

**Senator FIELDING**—Yes.

**Dr Ashworth**—Not to my knowledge, no.

**Senator FIELDING**—And certainly not on wind turbine syndrome?

**Dr Ashworth**—No.

**Senator FIELDING**—I understand that the CSIRO has developed a smart load system that reduces the need for large scale storage of energy and that this technology has been provided to the wind energy companies. Is that right?

**Dr Ashworth**—I would not be able to comment on that as a social scientist, but I could take that on notice.

**Senator FIELDING**—You may take on notice: has the CSIRO developed a smart load system—I believe it has—which is being provided to the wind energy companies? Has the CSIRO got any vested commercial interest in seeing wind energy continue? Is the CSIRO providing it on a commercial basis? I suppose you cannot answer that because you do not know whether you are. You can take that on notice.

**CHAIR**—Senator Fielding, if you have a couple of questions there, perhaps we could give them to the witnesses on notice. I suspect you have a series of questions that unfortunately we are not going to be able to answer right now. Is that okay?

**Senator FIELDING**—Yes. That is the best we can do.

**CHAIR**—I am happy for you to ask more questions. I am not trying to cut you off. I am just saying that it might be better to move on to your other questions and we will put those on notice.

**Senator FIELDING**—Yes.

**CHAIR**—We have until 11.45, so you can ask a few more questions and then we will move to other senators.

**Senator FIELDING**—Would the CSIRO be able to talk me through the difference in measuring noise in dBA versus dBC?

**Dr Ashworth**—Not from my perspective. I am not aware that there is.

**Dr Hall**—We are social scientists so we would have to take that on notice.

**Senator FIELDING**—You will have to take that on notice as well.

**Dr Ashworth**—Yes.

**Senator FIELDING**—I would be very interested to know whether the CSIRO can take us through the differences between measuring dBA and dBC. You can take that on notice. I will leave it there for the moment.

**CHAIR**—Senator Boyce.

**Senator BOYCE**—We had evidence earlier today from the department of climate change around the guidelines for development of wind turbine sites, setting out some best practice methods. Did you take those into account when you did your study? I am talking about the review that you are currently doing of factors affecting societal acceptance. Did you look at the guidelines?

**Dr Hall**—To clarify, we are in the middle of our research. The submission does not mention them because we had not looked at them in the literature at that point. We have now looked at them, but the publication will not be available until—

**Senator BOYCE**—I asked the department if they had any sense of what the level of adherence to best practice was. Are you able to comment on that question?

**Dr Ashworth**—It is probably not our research question. We often conduct case studies to look at analogies with other energy technologies to see what we can learn. When we talked about the planning processes, the idea of open and transparent consultation, starting early and those sorts of things are critical components and often when we are reviewing energy technology being deployed across the world we would look at some of that to see what we could learn from those. From the point of view of those actual guidelines, that is not in our research.

**Senator BOYCE**—I guess what I am trying to get to is that sometimes opposition to developments like these can be more a symptom of poor community consultation than anything else. I stress ‘sometimes’. It is not always, but sometimes. I am trying to assess whether you have looked at that and come to any conclusion on the topic of how well community and stakeholder consultation is being done.

**Dr Hall**—Our submission to the inquiry mentions consultation, cites literature that talks about the issues of trust in a community and also about community owned wind farms. Research that exists suggests that consultation from the earlier stage and that involves the community in a meaningful way where they feel empowered and involved—

**Senator BOYCE**—Is this happening?

**Dr Hall**—Unfortunately, that is not our research question, so I cannot answer that.

**Senator BOYCE**—Do you have any comment on that area?

**Dr Ashworth**—I do not think we can comment at the moment. When the interviews are finished there will be some lessons that come out of that that might translate into some of those, because that will be observations through a range of interviews with all of those different stakeholders. It is a bit early for us because that has not been analysed or reviewed. That is where we are at with our stage of research.

**Senator BOYCE**—Thank you.

**Senator ADAMS**—In your conclusions you comment about improved models of compensation. Could you explain what you mean?

**Dr Hall**—Our definition of ‘compensation’ is the financial gain by community members, either as individuals or as a community as a whole. Current practices range through a variety of ways. There are wind turbine hosts who receive financial compensation on an annual basis or as a proportion of the wind generated. There are also community funds which, as the literature suggests, gives us the indication that they are optional for companies. Through the current literature that we are looking at, as well as submissions and letters that we have read for the literature review and information review, there are suggestions that there may be other models that may be able to spread the financial compensation or benefits across the community further. In our submission, one suggestion is a sliding scale of compensation so that the immediate neighbours who do not host turbines, but have the impacts, the visual aspect of them, the noise or other aspects, could gain financially as some form of compensation.

**Senator ADAMS**—How would that process go? Is this going to be in government policy? Is it going to be in the guidelines? How would it be policed?

**Dr Ashworth**—That is outside our scope around the policy side of things. There are models that come through in the literature. How that is translated into policy, I would not see as our area of expertise.

**Senator ADAMS**—Would you see that as being contained within the guidelines?

**Dr Hall**—That question would probably be better directed to the department involved in writing the guidelines.

**CHAIR**—Would you be in a position to provide advice to the department writing the guidelines saying that you think this would be a good idea? I think that is a fair enough question to ask?

**Dr Ashworth**—Just to clarify, we are always in a position to advise and our report will be made public at the end. That, in itself, is available with the findings from that.

**CHAIR**—In your report you could recommend one way or the other. I think that is where Senator Adams was going with that.

**Senator ADAMS**—It was. You have big companies running wind farms and then you have a little neighbour who is obviously having problems from being too close. The turbines are being built probably a lot closer than they should be and they are having effects from that. What guidelines, policy or even legislation is going to force that particular company to pay X, Y or Z compensation?

**Dr Ashworth**—From my perspective, the work that we do helps to inform those sorts of things. We could easily provide the advice. As to making the recommendations, from my understanding that is probably outside of my area, but the things that we find would be available and could be incorporated.

**Senator ADAMS**—The reason that I ask that question is that it came up in your conclusion. If you have a conclusion with a list of things then that is obviously something that is fairly important.

With noise, I have been involved with the aircraft noise committee as well and people living in rural areas and up in the hills, especially in Perth where I come from, have made comments, 'This is as quiet as a quiet bedroom', and all the rest of it. When you are in an area that is probably elevated and with valleys, on really still nights it is very different to living within the city where there is noise all the time, just a continual noise that everyone gets used to. When something is impacting on a very quiet area it is fine to say that you are citing the NHMRC report, but have you done any work in any other area rather than just the graph that they have put out?

**Dr Hall**—Is the question about work on other technologies?

**Senator ADAMS**—No, it is on noise. You have one thing here. You are citing the NHMRC report. I am wondering whether you have done any other investigative work or talked to anyone else about the noise or are you just relying particularly on what they have said?

**Dr Hall**—Just to clarify, is your question specifically about wind turbine noise?

**Senator ADAMS**—It is about wind turbine noise, but it is about the noise that we have there as 'a quiet bedroom', and then the wind turbine and then the other issues. It is just that you have referred to that. I just wondered if you had any other research papers where you have been able to determine that result.

**Dr Hall**—Yes. In the paragraph directly following that reference to the decibel noise we mentioned a peer review document from Gipe that does not try to measure the noise but identifies that noise inputs are important, whether they are linked with health impacts or not, because there are issues around perceived tranquillity. I will read that out.

The perceived tranquillity of the local landscape for the local population is often highly valued. The introduction of a new sound from which the surrounding residents receive no direct benefit heavily impacts on their acceptance and support of that technology.

**Senator ADAMS**—Do you have any other studies that you could quote about the actual noise levels from a wind turbine?

**Dr Hall**—The final document that we will publish will have much more on this. This is just a short submission that we made to you in the time available with the research that we had available. The public document will have more on this aspect.

**Senator ADAMS**—Can you come back to the committee on notice with some evidence of the noise levels and what you can compare them with?

**Dr Hall**—Yes.

**CHAIR**—Senator Brown, you said you had a question.

**Senator CAROL BROWN**—It may have been asked. I apologise for not being here earlier. I would like to go back to your conclusions in your submission. You talk about some of the 'negative perceptions being contradicted and/or disproved in current research from notable

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agencies, including the National Health and Medical Research Council, the World Health Organisation and the NSW Valuer General'. I am assuming that is all peer-reviewed material.

**Dr Hall**—Yes.

**Senator CAROL BROWN**—You continue: 'There is currently no evidence positively linking noise impacts and adverse health effects, the majority of property sales do not show any reductions in value after wind farm installation... In that part, particularly, can you provide us with that evidence? I am assuming that was from the New South Wales Valuer General's report?

**Dr Hall**—I would like to clarify the question. Are you asking about property values?

**Senator CAROL BROWN**—I am asking what it actually showed. You reviewed some research and I am just wondering what it actually showed?

**Dr Hall**—Just to clarify, the conclusion section is summarising the literature cited in the document.

**Senator CAROL BROWN**—Yes, that is right.

**Dr Hall**—We cite two documents. One is from the Valuer General from New South Wales and Henderson and Horning, who are real estate valuers, also based in New South Wales.

**Senator CAROL BROWN**—Are you able to give me some information on what it found? It says that it does not show any reduction, but can you expand further on that short statement?

**Dr Ashworth**—I will read out page 5 in the first paragraph of the New South Wales Valuer General's report. It looked at 45 properties near six wind farms in Australia and states:

Of these, 40 sales did not show any reductions in value. Of the five properties that received lower than expected sale prices, further work was recommended to confirm the extent to which these were due to the wind farm. Additionally, no reductions in sale price were evident for properties located in townships with views of the wind farm.

That is a 2009 document.

**Dr Hall**—In that document there is a literature review of many land property value assessments that have been done internationally, so that may be of interest to the committee. That goes right back from Denmark in 1999.

**Senator CAROL BROWN**—Do we have that document?

**CHAIR**—No, we do not have that document.

**Senator CAROL BROWN**—Can you get that document?

**Dr Ashworth**—Yes.

**CHAIR**—Senator Fielding.

**Senator FIELDING**—Obviously in your conclusions, which we also heard from the department, the current rate of wind farm installations needs to increase to meet this target. In other words, we are going to see a lot more wind farms under the current settings and parameters. I am concerned. From what I understand, the CSIRO has not done research in this area, but they are keen to promote it. I think your conclusion says that there is currently no evidence positively linking noise impacts. We heard from someone this morning that I thought sounded reasonably knowledgeable that there are links to adverse health impacts on people living near a wind farm. Are you relying on the NHMRC predominantly?

**Dr Hall**—As I understand it, there are two parts to your question.

**Senator FIELDING**—Probably more than that.

**Dr Hall**—I will answer the two parts at this stage, unless you need further information. In terms of the renewable energy target, I think you used the word ‘promote’. I would like to clarify that CSIRO is not promoting the target, but it is the policy reality that exists. We are investigating the possibilities around the renewable energy technologies that exist, including wind.

**Senator FIELDING**—You would agree that there could be a lot more wind farms around. You said, ‘The wind energy will contribute significantly to achieving RET.’ You also said, ‘The current rate of installation needs to increase to meet this target’, so you would agree that there needs to be an increase in wind farm installations?

**Dr Hall**—That statement is based on the literature cited about the technology of wind, its affordability and the fact that it is being rolled out and operational. Would you like me to answer the second part of your question?

**Senator FIELDING**—Yes.

**Dr Hall**—I think you are referring to Dr Pierpont’s work.

**Senator FIELDING**—Yes.

**Dr Hall**—As we have emphasised a couple of times, we rely on peer reviewed data and from notable agencies. The NHMRC is a notable agency, so we reference them heavily. We are aware of Dr Pierpont’s work, but we have not found it in peer-reviewed literature.

**Dr Ashworth**—Just in going back to that, I thought the last two paragraphs in the NHMRC public statement that they released probably sums it up:

Concerns regarding the adverse health impacts of wind turbines focus on infrasound, electromagnetic radiation, shadow flicker and blade glint produced by wind turbines, as discussed above. While there is currently no evidence linking these phenomena with adverse health effects, the evidence is limited.

Therefore it is recommended that relevant authorities take a precautionary approach and continue to monitor research outcomes. Complying with standards relating to wind turbine design, manufacture, and site evaluation will minimise any potential impacts of wind turbines on surrounding areas.

**Senator FIELDING**—Would you think that a precautionary approach would be to say that we should have a buffer zone around these things? Would you think that would be precautionary?

**Dr Ashworth**—That is probably outside our scope as a social scientist.

**CHAIR**—Senator Adams.

**Senator ADAMS**—Will CSIRO be conducting further research into the viability of wind energy in relation to the renewable energy targets? Are you going to do anything else into the viability of it?

**Dr Ashworth**—Speaking from my experience and the work that we are doing, we look at the range of energy technologies and part of the work that Dr Hall is leading is focusing on wind. We look at the range of technologies that are being used. There is some comprehensive work being done in the flagship around modelling and potential. Our work tends to focus on what the science tells us about these technologies at present and how we would communicate those out to society.

**Dr Hall**—We have 10 flagships all on different topics in CSIRO and one of them is called the Energy Transformed Flagship. They look into a range of renewable energy technologies. Wind and other renewable technologies are a focus of ongoing research.

**Senator ADAMS**—Are you looking at the viability of them, not just the fact that they are out there and doing things?

**Dr Ashworth**—There is a group that is economic modelling looking at the costs of different technologies, what their potential might be, where they might be deployed based on resource available and all those sorts of things.

**Senator ADAMS**—Thank you.

**CHAIR**—Thank you very much. We have given you some homework. If you need to clarify what we need, the secretariat will be able to help you.

[11.48 am]

**VINCENT, Mr Julien, Climate and Energy Campaigner, Greenpeace Australia Pacific**

**CHAIR**—Welcome. I understand information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. If you need a reminder the secretariat can provide it to you. We have your submission, No. 161. Before you make an opening statement I will just let you know that the Senate is sitting at the moment. We extended yesterday, so if the bells go it means that we have to go into the chamber. I apologise, in advance, if that happens. I would now like to invite you to make a short opening statement and then we will ask you some questions.

**Mr Vincent**—I would like to thank the committee on behalf of Greenpeace for the opportunity to contribute to this inquiry's understanding of the social and economic benefits of rural wind farms. Greenpeace regards wind power as an important part of the suite of renewable energy technologies that we must deploy if we are to reduce carbon pollution with the urgency that climate science demands. We have worked for about eight years with partner organisations such as the European Renewable Energy Council and the Global Wind Energy Council to produce scenarios of how such transformations can be made at global, regional and national levels.

The scenario modelling underpins our campaigns and advocacy for clean energy solutions such as wind power. I am pleased to say that our work is now being adopted by organisations such as the International Energy Agency and the Intergovernmental Panel on Climate Change. In Australia, where Greenpeace has around 100,000 supporters, we released an update last year to our 2008 scenario, which is attached to our written submission to this inquiry. With any luck I will have the opportunity to cover some of its main findings today.

With regards to the social and economic impacts of rural wind farms, I want to explain upfront how wind power offers substantial benefits to be enjoyed by rural and regional areas in Australia in particular, but also the wider Australian community. A key social impact is job creation. Compared to coal fired electricity, which is currently our main source of power generation, wind employs about twice as many people in the construction phase and similar numbers in permanent ongoing maintenance of the wind farm itself. Our energy revolution scenario that has been modelled would create about 19,000 direct jobs by 2020 as a result of that.

In terms of economic impacts there are numerous benefits to be enjoyed. Wind power is already as cheap or cheaper than coal fired electricity in many parts of the world, and I have with me today evidence of how wind power is reducing the cost of energy in Germany, Belgium, Denmark, Spain, Ireland and the United States. There are probably many more regions. I also understand from discussions with the department of energy that this effect is being observed here in Australia and I would advise the committee to consult with the Australian Electricity Market Operator if they wish to confirm this.

Wind power can also play an important role in preventing major hikes in power bills, such as currently being seen around Australia. A recent report from the Australian Industry Group notes

that electricity prices have increased 30 per cent over the past four years in Australia and may double again by 2015, the primary driver of this being the expense of maintaining and expanding the electricity network and that being passed through to consumers. Our current model of electricity supply, where large sources of fossil fuel power send electricity down to large centres of demand, such as a city, requires a huge infrastructure spend which shows up on our power bills, even though much of that infrastructure sits idle a lot of the time. Wind power, as an alternative source and location of supply, can help avoid these costs by balancing out the grid in terms of where power is sent from.

Wind farms also offer an additional source of income for rural communities. An example of that being farmers whose income can be heavily dependent on rainfall. Given that the output of a wind turbine can be accurately predicted from one year to the next that offers a reliable alternative source of income that can help farmers during lean years.

I would point out that economic stability and social stability run very close to each other. A community built on industries that are unsustainable and fragile is a community vulnerable to having its social fabric torn. One based on stable, sustainable industries is more likely to be socially stable.

The final and most important benefit is that clean energy does not generate carbon pollution. Clean air, land and water, and avoiding the impacts of climate change are some of the most obvious and fundamental social benefits that we can point to. These are also economic benefits and, as we begin to internalise the currently external environmental costs of carbon pollution into our energy markets, moving away from polluting power would result in a reduction in the cost of energy.

We understand that this inquiry was established, in part, due to some sections of the community vocalising opposition to wind farms and claiming that wind turbines generate ill health impacts. While I understand that the committee may wish to ask questions in this regard, it is important that I make three quick points upfront. First of all, Greenpeace's main area of expertise in this issue is in relation to the points that I first raised in this statement and the ones that you will find addressed in our submission. I may, therefore, need to refer to others to cover questions on this matter, but I will do my best.

Greenpeace would focus more on the issue of human health if we considered it a more genuine concern. We have a science unit based at the University of Exeter in the United Kingdom which ensures any potential environmental or social concerns with the solutions we advocate are scientifically assessed, and that applies to the whole gamut of solutions that we advocate across all of our campaigns.

The longstanding advice is that the claims of wind farms adversely affecting human health are unfounded. We understand that authorities that have been mentioned here before, such as the National Health and Medical Research Council, have also made it clear that no published scientific evidence exists to suggest that wind farms adversely affect human health. Just as we take the lead from the scientific consensus on anthropogenic climate change, we do the same on this matter. We are lucky in that sense, as a campaigning organisation, to be able to stand on the shoulders of experts. If we are to assess the health impacts of wind farms, or indeed any other

aspects of wind farms, it ought to be done also in the context of other forms of energy, and this brings me to my final point.

While I very much appreciate and respect that the committee has allowed for broad terms of reference into this inquiry, there is clearly an emphasis here on attempting to connect wind farms to human health. It is astonishing that we can gather here to have an inquiry into this issue without doing the same for other forms of energy, such as coal fired electricity, which is well established as a cause of health impacts and a taker of human life year in, year out, or the rampant expansion of coal and gas extraction which, through process such as fracking, poses major health risks to humans that we should be making every attempt to understand the full extent of. Greenpeace welcomes the debate about the social and economic impacts of rural wind farms, but to pander to the agenda of those who simply want to link wind farms to human health impacts for the sake of scepticism is an appalling waste of time that the original proponents of this inquiry ought to be ashamed of. I now invite questions.

**CHAIR**—Thank you. Senator Fielding.

**Senator FIELDING**—Welcome. I understand that you are probably focused on part (c) more than anything else in the inquiry, which is the impact of rural wind farms on employment opportunities. I will probably put it there more than anyone else. I am very interested to know if there is any research that you are relying on to say that wind farms have no adverse health impacts, no matter how close you live to them.

**Mr Vincent**—As I said in my opening statement—and I did hear CSIRO's evidence earlier—I will also need to rely on the statement by the National Health and Medical Research Council. Given that is a short statement and references other studies, I hope that the committee has already gone to the National Health and Medical Research Council and have asked them to extrapolate or expand upon what they have provided, given that they are a federal government agency.

**Senator FIELDING**—I believe we asked them to submit to this inquiry. What was the answer to that? We did not get anything from them.

**CHAIR**—We have not received anything. I will clarify that we are going to go back and ask them again. I have not checked with the committee, but I, personally, would like them to appear so we can ask them some questions and follow them up.

**Mr Vincent**—I welcome that and I would prefer to defer that question directly to them.

**Senator FIELDING**—So there is no research that you have done yourself?

**Mr Vincent**—Ourselves?

**Senator FIELDING**—Yes.

**Mr Vincent**—No. As I said, we are lucky we can draw on the material from other organisations. Where that may be lacking for yourself, as I said, I recommend that you go back,

hopefully through this inquiry, to ask the National Health and Medical Research Council to expand.

**Senator FIELDING**—You would believe that if you were living, say, 20 metres away from a wind turbine you would be safe? Do you believe that?

**Mr Vincent**—From my own personal experience, as I have spent quite a bit of time working for Greenpeace over in Europe where there is a much larger wind industry, I have been to many areas and rural communities where wind turbines are very close to homesteads and farm yards. Grazing takes place on the same land as wind turbines, so to that end I would say yes, but to be cautious about it, I would definitely recommend that you go back to the National Health and Medical Research Council, through the course of this inquiry, and ask them to expand upon what they have said.

**Senator FIELDING**—Has Greenpeace gone out and spoken to people who have had adverse health impacts from living near wind farms?

**Mr Vincent**—Not adverse. We have spoken to quite a few people who enjoy being around wind farms or who have made an effort to install wind turbines on their properties. At the beginning of 2009 we had some documentation of various renewable energy technologies, which included a couple of visits down to the coastal area around Portland in Victoria where we managed to speak to the locals around some of the wind farms down there. The mayor of the region and the managing director of Capital Prints had obviously turned a lot of the local residents who previously were—without going too much into the cliché—butchers, bakers, fisherman and farmers and skilled them up as engineers who are now producing wind turbine componentry. We have had a lot of evidence, anecdotally, of the benefits to be enjoyed by wind farms.

**Senator FIELDING**—Thank you.

**CHAIR**—Senator Adams.

**Senator ADAMS**—I would like to ask you about the economic advantages of wind power over the other energy sources. You touched on that, but could you expand on that for me?

**Mr Vincent**—Certainly. They are numerous, so I might just spend a moment to take you through them bit by bit. I will do it in the context of the cost of promoting wind and other forms of renewable energy. Sometimes the statistics bundle them in together. Here is an example from Spain, which is one of the countries that has aggressively developed wind farms, so we have some good data from there. This is the renewable industry, itself, and wind as a major component of that was 4.6 billion. The contribution to GDP as a result of that was 8.5 billion. That includes 3 billion of export value from the industry. The avoided fossil fuel imports as a result of that was 2.1 billion. The avoided greenhouse gas emissions and the permits they entailed came to 374 million. The reduction in the wholesale energy costs, which is a point that I will explain in a moment in how that works, is 4.8 billion, so that in itself covered the cost of the scheme. The study that I have here accounts for health savings due to the avoided use of fossil fuel based technologies of 148 million.

I will expand upon the point about reduction in the wholesale energy costs. When wind farms are operating they operate on an extremely low marginal cost. That makes sense when you think about it because you look at wind farms and there is no fuel input so there is no fuel cost as a result of that. Essentially they are stems and blades spinning, so when they are providing power into the grid at any particular point in time, they do so at a relatively lower cost in comparison to other conventional forms of energy. This is basically called the merit order effect.

It has been observed in Europe, where a study was done that covered Germany, Belgium and Denmark and found that the reduction in the wholesale cost of electricity, depending on the part of the country that they were in, was somewhere between 3 and 23 per megawatt hour produced. I am sorry, I cannot do the calculation in my head to translate that into Australian dollars. Basically what happens is that the more wind that you have providing energy in a particular point in time drags the cost curve of all the available sources across and it means that you have a lower spot price in the wholesale market. That benefit is mainly enjoyed by retailers because, of course, they purchase from the wholesale market and pass on to the consumer. It is unfortunate that when this phenomenon takes place, which is regularly when you have wind contributing to the mix, that those costs do not get passed on to consumers because that would be a fantastic and tangible benefit to be enjoyed by electricity consumers.

The other area that we should really consider wind farm as providing a positive benefit for the energy market in Australia is when you look at my statement which talked about how energy costs are increasing—they have increased by 30 per cent over the last four years and they may double by 2010, which is quite worrying—and the main drivers of that are related to fossil fuels. They are related to the incredible expansion, maintenance and upgrade of the electricity grid that is currently being done, which amounts to tens of billions of dollars across Australia over the coming five years and, of course, a carbon price will have an impact as well. That is a reduced impact with the less coal fired power and other polluting powers that you have in the electricity market.

Wind, when providing additional and an alternative source of power, avoids the need for those upgrades to take place. It is really expensive to upgrade the grid to the extent that we do. I am aware of a statistic that about \$3 billion of the cost of infrastructure in New South Wales for the Hunter Valley to Sydney electricity supply chain is used for around about 24 hours of the year to cover the really peak times when everyone has their air conditioners on on a hot summer's day. That is a waste. That could be avoided by putting solar panels on people's roofs in Sydney. It could also be avoided at other points in the electricity grid by supplying wind power so that the points of supply are balanced out. It is really hard to overstate how that will be significant in the context of future energy prices because they are going up and they are going up primarily and overwhelmingly to do with fossil fuels and the costs associated with fossil fuels. I know that is flipping the argument as it often comes out in the media, but the report that I brought along from the Australian Industry Group actually points to the significance of the cost of renewable energy support schemes in a power bill and it amounts to around about 1c per kilowatt/hour out of about 20-odd cents.

**Senator ADAMS**—What is the cost when the wind stops blowing?

**Mr Vincent**—That is an argument for introducing more wind farms.

**Senator ADAMS**—You still have to get power.

**Mr Vincent**—Unfortunately, when the wind stops blowing, if a particular farm is not providing that cheap power, then the cost of electricity goes up. If you do what has been done in Europe, where wind farms are strategically placed across a broad region so that the amount of energy that can be supplied will meet base loads to an extent—it will fluctuate obviously, and no-one is disputing that—if you spread out and manage through accurate forecasting when the wind is going to be provided into the grid, then you are best placed to be able to take advantage of the economic benefit. Wind is not the only renewable energy solution out there, as I am sure you are perfectly aware, and we need to deploy others, but wind is one of the more economically advanced technologies and it is one where we can start taking advantage of the benefits of it right now.

**Senator ADAMS**—How would wind go if there was no subsidy such as the certificates?

**Mr Vincent**—It is not going all that well, unfortunately, when there is a policy in place, but I will expand on that in a moment. It needs a support mechanism at the moment and we have the renewable energy target, which I have been a critic of, to a point, in the way that it has been handled over the last few years. In principle I very much support the renewable energy target and I think we need it. We need a financial mechanism to drive wind. As I mentioned in my opening statement, if we want to assess how wind would go with regards to financial support schemes, then we should also do the same for other forms of energy. It is currently the case that across state and federal governments in Australia there is \$11 billion worth of subsidies that encourage the use of fossil fuels and \$8 billion of that is at a federal level. I am just making the point that wind farms are in no way alone in terms of receiving subsidies.

**Senator ADAMS**—I just wondered what you thought.

**Mr Vincent**—I can elaborate on the point of the renewable energy target. Greenpeace does support it. However, the way that it has been handled since it was announced as an election promise in 2007 has frankly stalled the development of the industry. It was announced as an election commitment around about September-October 2007. Since then we waited nearly two years before it was brought into the parliament. For a government that is very keen to develop market mechanisms to develop clean energy and to address climate change, it is incredible the level of distortion by overlapping other schemes with the renewable energy target. It effectively ripped the certainty out of that policy. As a result, in 2008 about 450 megawatts of wind was installed, with 400 in 2009, and 167 last year. That is down largely due to the industry not knowing what is coming up next with the renewable energy target and not having that certainty in place.

**Senator BOYCE**—I understood you to say earlier that Greenpeace internationally had decided that there was insufficient reason to put more resources into looking at any health concerns around wind farms; is that correct?

**Mr Vincent**—I would not put it in those terms. We look at these issues as they emerge internationally, and we make a judgement about them based on the literature, but then, of course, we continue to track the issue.

**Senator BOYCE**—How did you arrive at that judgement? What steps had been undertaken to get you to that point?

**Mr Vincent**—I would need to consult our science unit at the University of Exeter for that.

**Senator BOYCE**—That would be fine. If you could take that question on notice, that would be great. Thank you.

**Mr Vincent**—I am happy to. I will just note that down.

**Senator BOYCE**—Some of the evidence we have had suggests that some of the opposition to wind farms is defined as jealous neighbour syndrome, where people who are not getting compensation for having turbines on their property, but the next-door neighbour is, feel left out or whatever. Does Greenpeace have a comment on that? What is your experience in that area? You might like to talk about the European situation?

**Mr Vincent**—Actually I think it would be great if the financial benefits that can be brought to the owner of a site on which a wind farm is placed could be spread more throughout the community. I am very supportive of projects like the Hepburn Wind Project which is very much a grass roots up model, where the community have come together and said it wants to build this very small wind installation but one that means a lot to that local community. I think there are various aspects that engender opposition throughout the planning, consultation—

**Senator BOYCE**—You might like to talk about those, perhaps?

**Mr Vincent**—You will probably have representatives from the wind industry addressing you through these hearings.

**Senator BOYCE**—It is very hard to do a hearing without asking them, yes.

**Mr Vincent**—Absolutely. They should also acknowledge, I hope, that planning processes have not always gone as well as they could have done, and I think that is partly to do with the model of community consultation. They will have learnt some hard lessons from it. Also, it is something that we need to place a responsibility upon governments to manage, because at the moment we have state, federal and local administrations that are not as cohesive as they could be in terms of developing planning models that basically accommodate all those levels of government at once. I would hate to make major recommendations here to send things off to COAG, because that can often be a bit of a graveyard for initiatives—

**Senator BOYCE**—No comment.

**Mr Vincent**—No offence meant. I would prefer to see an effort made to look at ways in which the economic benefits can be spread more broadly throughout communities. I think that would assist. You asked for a European example. The German model was fantastic. I think it was in 1994, the federal legislature went to all of the provinces around the country and said, ‘Look, in one or two years’ time we want you to say where your 1 per cent of wind energy is going to come from. Go tell us, or we will do it for you.’ They set about a 12-month period where the consultation process could be driven from the ground up in those regions.

**CHAIR**—A community planning exercise?

**Mr Vincent**—Yes, that is a good way to put it. It is a community planning exercise, and I think that worked extremely well.

**Senator BOYCE**—Are you suggesting that it would be possible for us in Australia to have as much wind power as is reasonable using cooperative and not-for-profit models of wind farm generation?

**Mr Vincent**—I think it can still be something that is delivered by setting a framework at a national level. As far as the guidelines for developing wind in any particular state or district, I would suggest to the committee that I am happy to provide some more documentation on how the German example worked. That might provide a really useful insight.

**Senator BOYCE**—That would be helpful, thank you. The other area I have been interested in is community consultation, which can mean a multitude of things. There is a best practice guideline from the department of climate change which includes how to go about community and stakeholder consultation. Has Greenpeace looked at this document? Do you have any views about how it is being used in practice?

**Mr Vincent**—I have not looked at the document, and I am not sure if others have within Greenpeace, so unfortunately I am not really in a position to comment on it.

**Senator BOYCE**—As a simple inquiry, I am not suggesting that you be forensic about this, but if you could check if Greenpeace has at any level looked at the document and come to any sort of view on it, that would be useful?

**Mr Vincent**—Yes, I am happy to do that.

**Senator CAROL BROWN**—I wanted to go back to some of your key points, and particularly just concentrate on the information you have given about in Australia. You have talked about the potential of providing 19,000 jobs in Australia and you have also talked about the potential of attracting \$20 billion of investment into the Australian economy. Can you further expand on how you have come to those figures?

**Mr Vincent**—They are based on assessments that I have seen from others, including I think the Clean Energy Council. I may have borrowed those figures from the Clean Energy Council. As far as the job creation goes, that is something that has been derived directly from research that we have commissioned and is contained in our Energy Revolution Report. It coincides with Australia developing, I believe, 20.4 or 20.8 gigawatts of wind power across the country by 2020, and that was part of a scenario that we constructed in order to demonstrate that it is technically and certainly economically possible to deliver a 50 per cent cut across Australia's greenhouse gas emissions within that time frame. We have, unfortunately, lost a year since then, but that is what it relates to. Those are direct jobs as well, just to clarify it.

**Senator CAROL BROWN**—In Greenpeace's research, have you looked at the ongoing economic benefits in regional areas?

**Mr Vincent**—This does not come through in the modelling, but it is pretty clear both from what we have seen in terms of early development of wind in Australia and what we would expect in rolling this out, that you would have a lot of the industrial development and the job creation initiated and sustained in rural and regional Australia, such as around the Portland region, which I have mentioned previously—anywhere that you can take a view as to where regionally it is a good site for developing the wind industry. The industry will be sustainable in certain areas. I understand that construction jobs will come and go, but the need for construction will continue and maintain as these wind farms develop beyond 10, 15 and 20 years, and that includes the contribution of maintenance and the development of replacement componentry where it is required. We will be talking about developing continual bases of manufacturing in industry.

**Senator CAROL BROWN**—Just going back to your Portland example, when was the wind farm built there?

**Mr Vincent**—It is not just one wind farm. There have been a few. I am very much aware that the Waubra wind farm, which I think was established in the last couple of years. At that time it was the largest wind farm in Australia at 192 megawatts. I understand there are a lot of proposals for additional wind farms. Unfortunately, as I have explained, the policy settings up until 1 January this year have not necessarily encouraged that.

**Senator CAROL BROWN**—Have you been on the ground at Portland? Do you know what the community feeling is in terms of the wind farms that are there? Are they supported?

**Mr Vincent**—Second-hand and anecdotally, I do. Personally I have not been to Portland to discuss this, but Greenpeace actually sent a team of people down there to talk to the local community about what was being observed. We talked to the mayor of the shire at the time who was very enthusiastic and supportive of the jobs that were being created, and the pride that the area was taking in doing their bit to address climate change in particular. If there was significant opposition from someone in that position, then we would have expected to hear it through them, but we have heard what I would say are glowing tributes to the industry in what it is providing to the area.

**Senator CAROL BROWN**—In your opening statement you talked about there not being evidence of the health impacts as to the real reason why there is some opposition to wind farms. You mentioned the word ‘sceptics’. Can you expand on that statement? Why do you think people are raising health impacts as a reason for their opposition to wind farms?

**Mr Vincent**—I am sure there are a number of reasons that contribute to the overall part of the population that opposes the development of wind farms. I would say a portion of that is ideological; it is connected to the unwillingness to do anything that is related to progressive action on climate change, and it is basically taking matters of convenience arguments to oppose such action. I am not saying that is the only driver. I understand that people will have genuine opposition to wind farms on the basis that they do not like to look at them, and they do not like them in their area. They obviously do generate noise; no one disputes that. So they may be put off by that.

It was either a committee member or a representative from the CSIRO earlier who said if you are not getting any material benefit from something that is generating noise then you will be put off by it. I can completely understand that. That is not limited to wind farms. Air conditioners going night and day in the city when you are trying to sleep next to them are another example. I do understand that, but I believe that there is a strong element of this that is based on and tied into the movement in Australia that would prefer we do not do anything on climate change and are very sceptical about climate science itself.

**Senator FIELDING**—I cannot let that go. Are you not aware of quite a number of people who were living quite close to wind farms in Victoria that are very, very supportive of wind farms and renewable energy targets, and who want to reduce carbon? In actual fact, that is how they started, and in the end they have actually had to leave because of adverse health effects. There is no way that you could ever say to them that they are against wind farms for the sake of it, because they are not. I just do not believe that some of what you are saying is true. There are people out there who are genuinely concerned about the health effects, and I think they are separate issues.

**Mr Vincent**—There are two points on that. One is that I did not attribute the entire part of the population that are opposed to wind farms as being down to ideologically based. However, I do experience people telling me that they do not like wind farms because they were made sick by them and they also say that they think climate change is a load of expletive—I will let you fill in the gap. So, it is part of the overall population that makes it up. We field this from people out in the street.

**Senator CAROL BROWN**—We have had evidence that argued that wind farms have been imposed on rural areas against the wishes of local residents. In your experience, and in Greenpeace's experience of being out there on the ground, what do you think the situation is?

**Mr Vincent**—I was looking at the Hepburn wind farm project as I was preparing for this hearing today, and I recall that they had 18 oppositions to planning approval for that wind farm. There will always be opposition. At the same time they received over 300 submissions in support of the project. With respect to this inquiry, from a preliminary analysis by one of our well-respected volunteers, more people are submitting to this inquiry who support wind farms than are opposed to them. I would say in that respect that there will be opposition, inevitably, for various reasons, but they need to be viewed in the full context of the views of the community as a whole. Measures should be used to make sure that the mood and the sense of the community is genuine about any particular project.

**CHAIR**—You quoted some statistics at the beginning of your statement with respect to economics in overseas countries. If those statistics are contained in a document, could you provide that document? It does not have to be now; you can take that question on notice. Is that available?

**Mr Vincent**—Yes, I brought most of those documents with me today.

**CHAIR**—It would be great if we could get a copy of that. You have been referring to an AIG report; do you have a copy of that?

**Mr Vincent**—That is with me.

**CHAIR**—Thank you; that would be great. Following a question that Senator Boyce asked concerning the work that Exeter University does for you, you will be aware that we heard from Dr Pierpont this morning, and I wonder if they have assessed her book *Wind Turbine Syndrome*. If so, how recent was their advice and have they looked at the information in that report?

**Mr Vincent**—They might have done a couple of things. They might have looked at the book itself; they may have looked at summaries of the book and reviews of it or they may not have done; I should not presume. I am certainly very happy to go and find that out from them.

**CHAIR**—If you could take that on notice and add it to the question from Senator Boyce, that would be appreciated. My final question goes to the issue raised by Senator Brown. I appreciate your comments about looking at what is genuine and what is not, I have certainly been aware of different community responses to wind farms, anecdotally, because I have not measured it, but where you get more support for wind farms is where the community consultation process has clearly been comprehensive. I presume that is the sort of thing you were talking about when you referred to the issue of community planning. Do you have examples of where you found that the community consultation process has not been effective, and how that relates to the way the community feels about wind farms?

**Mr Vincent**—Off the top of my head, it is hard for me to think of specific examples. I understand that I have some homework to do in terms of the guidelines from the department, but certainly I can provide that as part of a response to looking into those guidelines.

**CHAIR**—Perhaps examples of where you do not think it has been well done, and I appreciate from what you have just said that you think Hepburn has done it well, but any other examples where you think it has been done well and has not been done well?

**Mr Vincent**—Sure. I also do not want to start rattling off potential projects.

**CHAIR**—I appreciate that. I do not mean to drop you in it. I appreciate the sensitivity, but it would be useful, maybe even for what has worked and what has not worked. If you are reluctant to drop somebody in it, what works and what does not work—or drop one of the wind farms in it.

**Mr Vincent**—As Greenpeace, we are happy to drop anyone in it if they deserve it.

**CHAIR**—Okay, then feel free. Obviously the community consultation side is clearly coming out in this inquiry. Recommendations or comments on what people think works and does not work would be really appreciated.

**Mr Vincent**—Certainly.

**Senator ADAMS**—With respect to the base load power, and this is something that really worries me, in Western Australia we have a very large wind farm that has been half constructed. They have found that the power line that has to go back to the grid is not up to the job—that is probably the easiest way to describe it. Some \$175 million has already been expended on this

particular farm, and there is a query now whether or not they will go ahead with it. Somehow there was a slip-up with the environmental protection people who have looked at that, and something has gone amiss. Do you know of any other wind farms that have been partially constructed or have got themselves going and then found that somewhere along the line the red tape has prohibited them from continuing?

**Mr Vincent**—Not in Australia. The only trend that is now being addressed is in China. I know it is hard to compare the Chinese context with anywhere else around the world, but basically they were building wind farms so quickly that the grid could not catch up. The current slowdown in the industry is basically so that they can get the current crop of wind farms that have built connected and providing energy into the grid.

In terms of Australia, that is the only instance of which I am aware that a grid connection line has seemed to be inadequate. Obviously that will impact on the cost of that project. The only other point I would make is that, in terms of the infrastructure required for particular power sources, what is required for most renewable energy power sources is per unit of energy capacity lower than conventional sources, which is something we should appreciate, especially in light of the comments I made previously about the spiralling cost of electricity being down to transmission upgrades.

**CHAIR**—We have given you lots of homework. If you need clarification, the secretariat will have it for what your homework is.

**Mr Vincent**—Is there a time frame to deliver this? The only reason I ask is that our science unit currently is quite busy. There is a major nuclear disaster going on in Fukushima at the moment that they are spending a lot of time working on.

**CHAIR**—I appreciate that. Could it be provided within three weeks?

**Mr Vincent**—About three weeks; that is fine.

**CHAIR**—Okay, much appreciated. Thank you.

**Proceedings suspended from 12.30 pm to 1.35 pm**

**HURST, Mr Phillip, Chief Executive Officer, Aerial Agricultural Association of Australia Ltd**

**CHAIR**—Welcome. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you—

**Mr Hurst**—Yes, it has.

**CHAIR**—We have a copy handy in case you need a refresher. We have received your submission, which is No. 2. I invite you to make an opening statement, and then we will ask you some questions.

**Mr Hurst**—On 10 January this year, a 58-year-old professional aerial application pilot, Stephen Allen, struck an unmarked, unnotified wind evaluation tower in his aircraft while conducting a legal aerial application operation. He was killed. Mr Allen was operating near San Francisco in the United States. In Australia, despite safety warnings from our association over recent years, we perpetuate the situation where the life of a professional aerial application pilot, and other legitimate low-level aviators, is not deemed worthy of protection by the simple mandating of wind monitoring tower marking and notification.

Wind monitoring towers are currently spread throughout rural Australia by wind farm developers to determine if an area is suitable for development. Wind monitoring towers are often 85 metres tall; they have guy wires extending 45 metres from the base and they can be erected very quickly, literally overnight. Four As, as we are known, is directly opposed to the establishment of wind farms in areas of agricultural production or elevated bushfire danger on two grounds: first, the safety of pilots; and secondly, the economic damage being caused to the industry and consequently to agriculture and the wider community.

There is no overt legal requirement for these towers to be marked or for their presence to be notified to any pilots or any government agency. They pose a grave threat to pilots. Mandatory marking of all wind monitoring towers and mandatory notification to a real-time, web based database would be two key initiatives to support reasonable aviation safety.

On a separate issue, the plumes of disturbed air that may extend 15 times or more the height of the turbine blades behind the wind farm are also of concern, as is the lack of research that quantifies this significant potential threat to aviation. These direct aviation safety issues characterise a commercially driven industrial power production sector that does not take its duty of care seriously and which is in desperate need of regulation to ensure the mandatory marking and notification of towers to all low-level pilots and greater research into their impacts.

Economic damage to the aerial application industry is perhaps not as obvious but is just as devastating. One industry, industrial energy production, seeks to impose costs and reduced operating areas on another industry, aerial application, with no consideration of compensation. The land and air space footprint of wind farms is far greater than the site where they are located, due to the operational requirements of aircraft, and may extend for kilometres around each turbine. This represents the removal of valuable land from agricultural production and the land

removed may not be that of the wind farm hosting landholder; it may be their neighbour. When this impact is multiplied across Australia, the economic damage is very significant indeed.

The answer is not to further penalise the victim by placing buffer zones around wind farms. The issue is to ensure they are not built in areas where their existence causes economic hardship on pre-existing sectors such as agriculture and aviation. People's food and fibre do not magically appear in the shops; they are grown by farmers on agriculturally productive land. The more agricultural land removed from production for whatever purpose—coal seam gas, coal mining, urban encroachment, hobby farms or wind farms—will all serve to reduce the ability of Australia to service our domestic market and earn export dollars. As a key supplier to agriculture, and for bushfire protection of the community, wind farm impacts on aerial application should be considered as a direct attack on rural communities by industrial wind farm companies. The right to farm should be given at least equal footing with the right to build an industrial wind farm. Thank you.

**Senator ADAMS**—Thank you very much for that introductory statement. What is CASA doing about it?

**Mr Hurst**—We have spoken to CASA on a number of occasions over the last several years. We have been involved with a workshop they had on man-made obstacles, and the short answer is my feedback from CASA is that they do not feel they have the head of power to mandate anything.

**Senator ADAMS**—Where do you think that head of power should come from? How do you see regulations being formulated?

**Mr Hurst**—Again it comes back to a legal interpretation of the powers given by the Civil Aviation Act. The act actually gives quite broad powers for the regulation of anything that affects aviation safety, although it seems that CASA's internal legal advice—and I do not want to speak on their behalf, but this is what I have heard—precludes them from taking any particular action on this. My understanding is that this issue of wind farms away from airports has been referred to a new group established within the Department of Infrastructure and Transport called NASAG, the National Aerodrome Safety Advisory Group, which is looking at some of these issues and is hoping to produce something, although I think of an advisory nature at first rather than a mandatory nature. Our view is very clear: it should be mandatory. The obvious home for this type of regulation would be with the Civil Aviation Safety Authority.

**Senator ADAMS**—Absolutely. As far as lighting goes, or anything like that, have they come up with any regulations for that?

**Mr Hurst**—They had an advisory circular that was to do with lighting, and my understanding is it was withdrawn when they felt it could not stand up because of a lack of head of power. Lighting is not so much an issue for aerial application pilots or, for that matter, most pilots, because if you are flying at night you should be above the lowest safe altitude unless you are conducting the operations that we do, which is spraying at night, and that generally only happens in the cotton fields or out west where we are able to work with very flat country that has been pre-surveyed et cetera, to maintain safety. There is not really a strong connection between lighting of wind farms at night and aviation safety.

**Senator ADAMS**—I am from Western Australia, have been a farmer for many years and used aerial spraying an awful lot. I am just thinking of the terrain. We have a proposed wind farm going up on a ridge that is quite elevated and the towers will be up to the level of a 48-storey building, so they will probably be the highest ones in Australia. We grow a lot of canola in that area and I am concerned how the spraying will go there. It will be quite tricky, but the lighting was something that I wondered about, because we do have a number of low-flying aircraft at night doing various things.

**Mr Hurst**—I think that issue comes back to consideration of the particular geographic location. If it is on top of a hill and it is a couple of hundred metres above that, although that might not penetrate what is called the ‘pan ops’ surface, but it may have an operational implication. The difficulty we have both with wind monitoring towers and a lesser extent turbines is simply that we do not know what is out there, and we have no consistent way of telling either that these monitoring towers are going up or that the turbines have been put up. Obviously we have our local intelligence that tells us very quickly if something has gone up, but I had a situation recently where an operator told me that he had sprayed a paddock the week before, went out and did the usual aerial survey on what was a dull day and it was not until he was half-way through the paddock that he realised he was sharing that paddock with a brand new wind monitoring tower that had been put up in the previous week.

The difficulty is getting access to the information. Some wind farm companies—and I can only say ‘some’—do notify us of the position of these wind monitoring towers, but we simply do not have the resources to get that information out to every pilot. We send it to our members, and we make best efforts on the basis of no liability being assumed. But it is really too big a job for a small association with three staff to manage. Again, it is a case of an externalisation of costs by the wind farm industry.

**Senator ADAMS**—Are you notified of power transmission lines? Normally with any new lines going up, are you actually notified by the energy source?

**Mr Hurst**—Not normally. We have very good relations with one company in New South Wales, which is Country Energy, that supplies most of rural New South Wales, and we have worked with them for the past six or seven years on the marking of power lines. I was actually chair of the Australian Standards Committee to review the marking standard, to allow cheaper markers to be used, and there are now more than 1,000 of those up in New South Wales. Unfortunately, other states have not taken that same view of marking of power lines.

**Senator ADAMS**—So they simply have not picked up the standard, is that what you are saying?

**Mr Hurst**—No. I was chairman of the committee, but I was not the only person on it, obviously, and the power companies took a very different view to my suggestions that we needed fairly consistent marking. The standard is written in such a way as a recommendation to the landholder to conduct a risk assessment. The power companies were much more concerned about the cost of putting the markers up and, as long as they could nail the cost on to the landholder, they were quite relaxed.

**Senator BOYCE**—You mentioned the death of a pilot. Could you tell us what has happened subsequent to that?

**Mr Hurst**—A number of things are happening. For the first time the Federal Aviation Authority, which is the equivalent of CASA in the US, is taking it very seriously. One of the compounding factors in the US is that they have a threshold of height above which towers have to be notified to the FAA's tall obstacle database. That threshold is 200 feet. Cynically, most towers in the US are built at 198 feet. So you can clearly see the problem that we have. If Australia were to go to a mandatory notification and marking system, as soon as we put a height threshold that would be exploited by the companies. The difficulty we have is coming up with a situation that is risk based but still binding.

**Senator BOYCE**—When you say that would be exploited by the companies, what is the cost to the companies of notification? I do not quite see why they would have a problem with simply notifying an authority that these existed, and that they were 202 feet high, for want of a better example?

**Mr Hurst**—I think the problem is that there is no clear pathway, and no government agency, either Commonwealth or state, sees that it has a clear mandate and head of power to require this. Even on an advisory basis, we would be happier with wind tower notifications happening on an advisory basis, but because of the duty of care and everything else, we are astounded that this just does not happen by the wind farm companies.

**Senator BOYCE**—I still do not quite understand what the cost to a power company would be? It would be quite small, would it not, in terms of development?

**Mr Hurst**—Absolutely.

**Senator BOYCE**—Are you saying it is because that might give them some liability that they would have concerns about it?

**Mr Hurst**—The major problem that has been explained to me by wind farm developers is commercial confidence, and they do not want their competitors knowing where they are putting wind farm monitoring towers because that may give a hint to their competitors where they are looking at developing a wind farm.

**Senator BOYCE**—I see.

**Mr Hurst**—So it is a commercial issue about confidence, and that is why I think the only way this would work sensibly is by mandating, preferably through the Commonwealth because of interstate consistency requirements, and I do not think it would be a huge cost for the Commonwealth to set up a database and manage that database.

**Senator BOYCE**—I can readily picture that crop dusters are members of your association who might be concerned about wind farms. What other aerial activities could be affected?

**Mr Hurst**—Professional aerial applicators, as we prefer to be known these days—

**Senator BOYCE**—I am sorry, you can see my lack of recent experience in the field.

**Mr Hurst**—Not a problem, senator, we are here to help. Professional aerial applicators are not the only ones affected, of course. Any pilot conducting low-level operations, such as mustering, power line survey, geo-magnetic survey for mining et cetera, all of them are required to be operating, by the nature of their operation, below 500 feet. Aerial bating for vertebrate management, for rabbit control, and of course the work that we do includes fire bombing, fire survey, as well as locust control and mouse bating. Anywhere you see a plague, you are probably going to see us involved in trying to manage that and mitigate the damage.

There is a wide range of aviators who have a legitimate reason and all of the safety operating procedures in place to be working below 500 feet quite safely. The difficulty that we have is a new industry has sprung up that does not seem to be too worried about aviation safety. Our concern is that we do not want to be in the position of the United States where a death is required before the regulator gets involved and starts to regulate. The FAA is also looking at putting out a new standard or a new advisory circular on the marking of wind towers and wind farms in conjunction with their tall structures database. We have a tall structures database in Australia. It is run by the RAAF, but there is no mandatory requirement below a certain height to report to that.

**Senator BOYCE**—What is that height?

**Mr Hurst**—I think it is 110 metres, but I am not 100 per cent sure.

**Senator BOYCE**—If you could confirm that for us on notice, that would be good.

**Mr Hurst**—I am happy to do that on notice.

**Senator BOYCE**—Your solution to this is that there would be no wind farms or wind monitoring towers in areas where aerial activity was likely to happen. Have you looked at the practicality of that suggestion?

**Mr Hurst**—The practicality, of course, would be a major impost on wind farm developers. The reason we look at this is that the cost to our industry is measured in deaths. The potential cost to their industry is measured in dollars.

**Senator BOYCE**—Would the practical effect not be that all wind farm development would basically have to happen in urban and semi-urban areas?

**Mr Hurst**—That is a decision entirely for someone else to make in the planning process. I would suggest that if the planning processes were more consistent across Australia and the planning processes were more detailed, if you like, we would probably get better outcomes about the placing of wind farms and associated infrastructure. Yes, there would be a significant cost on wind farms, but at the moment that cost is just being externalised onto the community and contracting organisations like us with a legitimate requirement to be operating in low-level air space.

**Senator BOYCE**—You mentioned, for instance, aerial bating. It would seem to me that it would be rather difficult, except for excluding virtually every rural and regional area of Australia, to decide that there was never going to be aerial activity in area A or B.

**Mr Hurst**—This is the difficulty that we have because of the way the planning process has developed, somewhat piecemeal.

**Senator BOYCE**—I can understand an ambit claim from your organisation.

**Mr Hurst**—No, it is not an ambit claim. What we are on about is that we are simply talking about competition for land use. There is a pre-existing land use that is not being valued in this process, and that is agriculture. The problem we have is that, whilst ever this is no value attached to agriculture, and there is obviously a higher value attached to wind farms, then it is not a very fair evaluation. In a number of evaluations, including the Berrybank wind farm in Victoria, we have seen the words used by the assessors as the process being gone through where agriculture and aerial application in particular is being disadvantaged is inequitable and unfair. All I can put to you is that the situation at the moment is simply unfair and inequitable for our industry; why should we be asked to carry this burden for the rest of the community, particularly where there is no compensation being offered? It is not just about ‘not in my backyard’; it is simply that there is not even an effort to try to get on together.

**Senator BOYCE**—Are you able to give any examples of where aerial activity has been restricted or constrained by the existence of wind farms?

**Mr Hurst**—Certainly the western districts of Victoria is a very good example. More wind farms are being planned for that area.

**Senator BOYCE**—What is being stopped? What is not happening the way it would?

**Mr Hurst**—Aerial spraying of crops. We also have some concern being expressed by farmers, which you might have seen in the media recently, for the Boorowa area, just north of here. The concern is that, because the footprint of these towers is so large, in a heavily laden agricultural aircraft, which is what our pilots are trained to do, it is not that you can fly right up to the edge of the wind farm and then just avoid it. You have to actually allow a safe distance to avoid the wind farm. It might be that you are losing—

**Senator BOYCE**—What would be a typical safe distance? I know that is possibly a piece of string question, but can you give us some suggestions?

**Mr Hurst**—It is very much a piece of string question, but you would be looking at a minimum of something in the order of 500 metres as a safe distance. Again, it depends on which way the wind is blowing as to how close you can safely get to wind farms or any other structure that you are trying not to contaminate with the pesticides that you are applying. The issue really comes back to each individual development having to be assessed for its impact, particularly on neighbours who do not share any of the benefits of being paid to host the wind farm.

I hate using the term ‘buffer zones’ because we are not interested in buffer zones, but the difficult is there is an operational requirement that you will have to leave enough space to be

operate safely. That is our concern. We are being impacted, neighbours are being impacted, with absolutely no recourse to compensation for what is being forced upon us.

**Senator CAROL BROWN**—Are you able to give us some information about the economic impact on aerial applicators and farmers? Have you done any work on that?

**Mr Hurst**—No, we have not, simply because in the few cases where we have been involved in the development of wind farms, in the sense that we have been engaged in the development approval process, it is very difficult until the wind farm is actually built and operating to actually ascertain what the impact might be. With the seasonal variations we have had over the past couple of years, principally most of the operators have been very badly affected by drought for the last eight years, so it is very difficult to get a handle on what the implication might be, because during that drought period a lot of country might not have been treated that would have otherwise been treated.

**Senator CAROL BROWN**—You mentioned compensation earlier in your evidence. Do you have an idea of a mechanism or is it a case-by-case basis?

**Mr Hurst**—It has to be a case by case basis because we are in the situation where, for example, if it is on the hilly parts of the Great Dividing Range of northern New South Wales, principally that operation will be top dressing, where the aircraft is flown at a higher altitude. It is normally flown at roughly 30 metres, or 90 feet, to do the job. It may theoretically be possible to go much higher than that to get over the towers, but then of course the wind farm developers would, I imagine, be quite upset about the ping of superphosphate hitting their wind towers. There is a very practical difficulty with trying to ascertain what the economic impact might be. The only way that can be done, as we have said for years, is for the developers to actually sit down with the local aerial applicator and the farmer and work out what the plans are for, say, the next five years in terms of cropping, top dressing or other applications.

**Senator CAROL BROWN**—Has your association done any work at all in terms of putting down some parameters around what compensation might be?

**Mr Hurst**—No, we have not, simply because of the reasons I gave, that it is a case-by-case basis, and we say in our wind farm policy that we simply do not have the resources to undertake that work. We are a small association funded almost entirely by subscriptions from our members. We have a staff of three and a bit, and it is very difficult for us dealing with a range of operational safety issues, training, education, government reform in the chemical area to devote resources to an issue to the depth that you suggest.

**Senator CAROL BROWN**—Has the association discussed who should do that? Is it at the state level or the federal government?

**Mr Hurst**—Do you mean compensation or the assessment?

**Senator CAROL BROWN**—Yes.

**Mr Hurst**—Our view is that the assessment process, particularly at the state level as it currently happens, is fundamentally flawed. What invariably happens at the moment is that the

wind farm developer is responsible for the development application. If they are complying with best practice guidelines according to the Clean Energy Association, they will go off and get a consultant to do an allegedly independent assessment of what the implications may be, but of course that consultant knows on which side their bread is buttered, and they are highly unlikely to make damaging recommendations to the person who is paying their wage.

I would suggest the only way that we can get to an independently assessed and genuine assessment of impact is for either state governments or the Commonwealth to actually get involved in the development assessment process. At the moment it seems quite strange that the wind farm developers are the ones who are doing the so-called independent assessments for air safety reasons.

**Senator ADAMS**—I would like to go back to the planning. We received evidence from the department this morning, and it is pulling together all of the states. As you have said, they have different guidelines and different sets of criteria around their planning. The Commonwealth's role at the moment is to pull all those plans together and make some guidelines that should hopefully suit all states and territories. If you had a mandatory guideline put into that national plan, would that help?

**Mr Hurst**—We would certainly like to see that. In our policy we openly posit that there should be a moratorium on wind farm developments until there is a COAG process in place to consolidate and make more consistent the individual planning processes of the states. We list a number of things that we think should be in that planning process, including obviously for us aviation safety, but also issues of impact on bushfire preparedness, competing land uses and a proper independent life-cycle analysis of wind farms, so that we can actually determine whether overall in totality they are helping the problem or causing other problems that are not quite as transparent.

Those are the sorts of things we would like to see in a genuinely independent, consistent national process. The difficulty we have at the moment, and we have seen it more recently with Victoria, with the change of government, making a significant change to their wind farm policy, and where states are going off on almost different philosophies that really makes it even more difficult to make it a more national and consistent approach. We would certainly support a national approach, and our view is that there should be a moratorium on developments until such time as we get that national approach.

**CHAIR**—Thank you. I do not know that we gave you any homework, did we?

**Mr Hurst**—There was one small piece of homework, which is to clarify whether the trigger height for notification at the moment is 110 metres.

**CHAIR**—That is right, there was, too. Thank you very much.

**Mr Hurst**—I will come back to the secretariat with that.

**CHAIR**—Thank you very much for your evidence today. It is much appreciated.

[2.01 pm]

**PREST, Dr James, Private capacity**

**CHAIR**—Welcome. I understand that you have been given information on parliamentary privilege and the protection of witnesses and evidence?

**Dr Prest**—I have.

**CHAIR**—Do you have any comments to make on the capacity in which you appear?

**Dr Prest**—I am appearing in a private capacity; however, I am employed by the Australian National University at the ANU College of Law. In particular, I work at a couple of centres at that university—the Australian Centre for Environmental Law and the Centre for Climate Law and Policy.

**CHAIR**—We have your submission, which is No. 631. Before I ask you to make a brief opening statement, I remind you that the Senate is in fact sitting today—we did not expect it to be—and that means when the bells go and the red light flashes we leave here to go and vote. I apologise in advance for our having to abandon you if we do. However, we will be back. It only takes about five or so minutes. I invite you to make a brief opening statement if you wish to, and then we will ask you some questions.

**Dr Prest**—I have made a submission to you and provided only the executive summary of the draft that I am working from. There is a quite more detailed document that I will provide to the committee in due course. I guess the primary term of reference that I wanted to address is the term relating to (d) the interface between Commonwealth, state and local planning laws as they pertain to wind farms. The reason for that is obviously that is the term of reference that is closest to my professional expertise.

In relation to that, I have been admitted to legal practice since 1995, and I have been actively involved in the area of environmental and planning law since that date. I hold a PhD in natural resources management law and since 2007 I have been studying and publishing in the area of energy and climate law. In particular, one of the publications that I have attached as an appendix to my submission is a chapter from *Climate Law in Australia* which details the episode of the Bald Hills wind farm in Victoria, which is relevant to the topic of this inquiry.

For me, the fundamental concept that I would like to explore is which level of government and which legislature should have primary responsibility for regulating the environmental impacts of wind energy. By the very existence of this committee, it could be drawn from the fact that this committee is examining this question some suggestion that the Commonwealth should have a greater role in regulating wind energy.

I want to draw your attention to some of the points I have made in relation to that. In broad summary, I suggest that specific-purpose legislation by the Commonwealth parliament to address wind energy would in many ways violate a principle of consistency in regulation.

Essentially, I am suggesting that it would be inconsistent for the Commonwealth to regulate specifically to address wind energy when it does not seek to regulate the environmental impact of other types of energy sources other than through the Environment Protection Biodiversity Conservation Act.

I will say a number of things in relation the EPBC Act, and I have a number of specific suggestions about how it could be amended. Australia has a target of reaching 20 per cent of its electricity supply from renewable energy, and essentially I have set out in my submission the case that planning law issues are typically cited in the literature as one of the three most common barriers to renewable energy development, particularly wind energy development. If the Commonwealth is to be involved here, it should perhaps be seeking to consider the extent to which the legislative framework that exists in Australia will assist us to reach that target of 20 per cent renewable energy, and 20 per cent renewable electricity in particular.

First, it would be quite unprecedented for the Commonwealth to seek to regulate one particular electricity supply industry to the exclusion of the others. That would really violate a principle of consistency in regulation. I have stated in my submission that there are three circumstances in which further legislation could be justified. If it is the case that the effort to develop some kind of uniformity in planning requirements between the Commonwealth and the states across Australia is unsuccessful, and those cooperative processes fail, then at some point the Commonwealth could consider to become involved.

However, I make the broad point that it would be rather unprecedented for the Commonwealth to become involved on a day-to-day basis in land-use planning regulation, because the general rule applying in Australian environment and planning law is that the Commonwealth is not involved in these questions of land-use allocation and regulation of land uses unless it raises a matter of national environmental significance.

The EPBC Act sets out those principles and those matters which are of national environmental significance. The one circumstance that I have stated here is that if the Commonwealth were truly to step up to its international responsibilities in terms of meeting obligations under international environmental law, particularly the framework convention on climate change and the Kyoto protocol, it might be considering that climate change is actually a matter of national environmental significance and to include that within the EPBC Act. That would be one rationale for the Commonwealth to legislate in this area.

The third point is that if the Commonwealth found that a state legislature was taking what it saw as an ideological approach against wind energy and imposing unnecessary and scientifically unsupported regulatory requirements on the wind energy industry, the Commonwealth perhaps could consider whether it wanted to step in and legislate in the area on the basis that it has an international obligation to meet its climate change mitigation targets. For example, I have mentioned in my submission the proposals for a two-kilometre buffer zone, which in my opinion appears to be an arbitrary selection of distance which is not consistent with the international approach which is far more based on the individual circumstances and tailored to the particular wind project in question and the proximity of houses, the topography et cetera.

I have suggested if you took a case-by-case approach to national noise standards that would be a preferable approach to an arbitrary setback distance of a particular distance which in many

ways is inconsistent with the approach taken to other industries. The Commonwealth does not seek to create some setback for the creation of a coal fired power station, a gas-fired power station or some other type of oil and gas extraction activity. The Commonwealth is simply not involved in regulating those activities, at least on a terrestrial basis. The Commonwealth is involved in regulating oil and gas extraction and exploration in the Commonwealth marine area but, apart from that, the Commonwealth does not become actively involved in regulating the energy industry in terms of its on-the-ground environmental impacts, that is, apart from the application of the EPBC Act.

I will turn now to questions in relation to the EPBC Act in a moment, because I have some specific suggestions as to some problems with the EPBC Act. If it is a proposal that the Commonwealth should become significantly involved in regulating wind energy projects, this really rests on a premise that state regulation is either insufficient or inadequate. The case has to be made, and convincingly so, that that is actually the case. But that premise seems to be implicit in the terms of reference of the inquiry.

As I was saying, it is the fact that the large majority of the task of regulating development projects in Australia in terms of their on-the-ground impacts has fallen to the states and local government. If the Commonwealth was to become further involved, this obviously raises questions of duplication of state and local planning and environmental laws, and then the economic impact on the wind energy industry of increased Commonwealth involvement. I took the time to look at the state of investment in wind energy across the world. For example, just for the benefit of senators, in terms of installed capacity, China has 42.3 gigawatts of wind energy installed; Australia has 1.76 gigawatts. Obviously there is a greater population in China, but we probably have a similar land area. It could be possible for Australia to reach that level of investment. This is the scale of investment that could be considered, if the right policies were put in place.

Another aspect that needs to come into the mix is a consideration of the adequacy of Australia's regulatory framework with respect to the electricity transmission law and some of its problems. This leads me on to some complicated points relating to the difference between our Commonwealth incentive law for renewable energy, which rests on the operation of tradable certificates, and the predominantly European experience of using feed-in tariffs. One of the points I would like to submit to the committee is that if Australia is serious about reaching and exceeding renewable energy targets, we would be looking at national feed-in tariff legislation in preference to the tradeable certificates approach, because all of the international survey literature that is present indicates that feed-in tariff legislation has achieved the goals more quickly and at lower cost to the community than tradeable certificates.

There are international survey articles published, for example, in the journal *Energy Policy* which look at this question. The only nations in Europe which are using tradable certificate laws, such as Australia, are the UK, Poland and Belgium. The vast majority of other jurisdictions are using feed-in tariffs—

**CHAIR**—I am a bit conscious of time, so could you please wrap up shortly so we can ask you some questions.

**Dr Prest**—Let me get to the key points that I want to make about the EPBC Act, that is that there are some problems with the existing legislation in that the Commonwealth should be empowered within the operation of its act and the decision making by the minister for the minister to take into account the benefits of renewable energy generation in terms of addressing climate change and, indeed, some of the other environmental benefits such as reduced air pollution and reduced mercury pollution from coal fired generation. There are a couple of provisions in the EPBC Act that actually cause some difficulties if a minister was seeking to take into account some of these considerations.

I am drawing a distinction with New Zealand. New Zealand's Resource Management Act sets out a principle in the objects of the legislation that the benefits of renewable energy should be taken into account in land-use planning decisions. Australia definitely does not have that in its national environmental laws. Just bear with me for a moment while I find my specific notes in relation to the amendment suggestions for the EPBC Act. One of the points is that there has been a recent Commonwealth review of the EPBC Act, a statutory review called for in the legislation that happens every ten years—the Hawke review—and I just draw the senators' attention to the fact that the Hawke review does not recommend that the Commonwealth should become involved in legislating for wind energy facilities. Perhaps a higher priority for the Senate and senators should be to examine when and if the recommendations of the Hawke review are actually going to be considered for implementation in the form of legislative amendments to the EPBC Act.

In relation to the amendment to the EPBC Act, if you look at section 75(2B) of the act, when the minister is making a decision as to whether or not a proposed action caught by section 523 of the act should require an approval or not—in other words, is a particular project a controlled action—in making that decision the act says the minister must not consider any beneficial impacts the action, first, has or will have or is likely to have on the matter protected by each provision of Part 3. So, in other words, specifically at the moment the legislation is prohibiting the minister from looking at, for example, abatement of climate change impacts, which might have benefits for matters protected such as threatened species or endangered ecological communities.

Secondly, because climate change is not listed as a matter of national environmental significance under the act, it would be an adventurous decision maker who sought to consider it because that would leave their decision vulnerable to challenge for taking into account irrelevant considerations.

In relation to proposed amendments, if you look at section 136(5) of the act, when the environment minister is deciding whether or not to approve a project that is subject to the act—just as an aside here, I did a survey, a search, on all of the wind energy projects that had been put forward to the Commonwealth for a decision as to whether or not they should be considered to be a controlled action; only 14 per cent, 14 out of 100 projects, were actually considered to be a controlled action. So, in other words of the vast number of wind energy projects that come before the Commonwealth minister for decision as to whether or not they should be regulated, only 14 per cent of them are considered to be a controlled action. So, that gives you an indication of, I guess, whether these projects are likely to have a significant impact on any of these matters of national environmental significance. Only 14 per cent of the projects have been found to have that impact or to be likely to have that impact.

Back to the amendment I was proposing. Currently, section 136(5) of the act says that the minister is prohibited from considering any matters other than the controlling provision. The controlling provision is the provision that relates to the matter of national environmental significance and the catch-all of social and economic factors. In other words, if you were to consider the positive benefits of wind energy projects in terms of mitigating climate change by reducing greenhouse emissions, then this would be an improper exercise of power by the decision maker. So, there are some problems here in terms of whether federal environmental law actually enables the decision maker to look at the national and global benefits of wind energy, because at the moment the emphasis in planning law is on looking at local impacts. There needs to be some consideration given to whether the law should be amended so that national and international benefits can be weighed up against the question of local impacts.

In the UK, New Zealand and Victoria there are provisions that I can draw your attention to which seek to, I guess, address that balancing exercise.

**CHAIR**—Dr Preston, we have got 10 minutes left and I think the senators will want to ask you some questions.

**Dr Prest**—Sure.

**CHAIR**—So, if that is okay, could I throw to the senators—and they may well ask you that question that you just touched on.

**Dr Prest**—Thank you.

**CHAIR**—Senator Adams.

**Senator ADAMS**—I do not know whether you were here when the department was here this morning.

**Dr Prest**—I am sorry, I was not able to be here.

**Senator ADAMS**—They were just trying to explain to us about the proposed guidelines and just what is being done with the states all being different and how they are trying to pull together the guidelines once the states have completed their drafts. Yet, for me, it was rather difficult because the Commonwealth wanted the guidelines but they really did not have any power over the states, so I do not know if the constitutional side of that comes into it. You were here when the last witness was here—the agricultural group?

**Dr Prest**—Yes.

**Senator ADAMS**—Where would you go in a situation like that? Obviously, each state is different as far as their aviation laws go, so how do we get some sort of continuity through so that people are not in danger and there is a little bit more uniformity with that type of issue. It is one of the issues, but it is a safety issue.

**Dr Prest**—I am not across the detail of Commonwealth aviation law, but I would be suggesting that for a full picture you might need to consult Air Services Australia in relation to

the application of Commonwealth aviation law. There probably are already some provisions of national application relating to some of these questions. As a broad principle, the point that I was making is that if the Commonwealth was to become involved in regulating this one particular industry, it would be setting a precedent that it should then become involved in regulating the environmental on-the-ground impacts—the specific localised impacts—of coal fired generation and gas-fired generation. Where do you stop—extraction of minerals and energy to fuel, coal and gas operations?

**Senator CAROL BROWN**—What do you think the effect of that would be on those industries if the national parliament—

**Dr Prest**—That is why I have not come to you to advocate that position.

**Senator CAROL BROWN**—No, but I am interested in your view and what you think.

**Dr Prest**—One of the points is that there is a practicality question. The Commonwealth does not have the on-the-ground officers with experience of land-use planning to suddenly become a land-use planning regulator. Yes, the EPBC Act does have sporadic application to matters of national environmental significance and it applies across Australia to include private land, but the Commonwealth is not seeking to cover the field and to take over regulatory responsibility for land management and regulation of on-the-ground environmental impacts. So, I am just saying that there would be a point of inconsistency if the Commonwealth were to take that step in relation to wind energy and not for other energy.

**Senator CAROL BROWN**—But in practical terms you do not think it would be able to work?

**Dr Prest**—I doubt that it would work because at the moment the Commonwealth already implements its legislative responsibilities under the EPBC Act through use of bilateral agreements and one-off accredited assessment, so the Commonwealth already uses the state agencies to gather information for it about environmental impacts and then uses that information to make a decision. I do not think, in our system of government, there is a way out of the current pattern of allocation of Commonwealth and state responsibility and the sharing of that responsibility.

**Senator ADAMS**—I am going to go right back down to the grassroots side of it now, with neighbours not involved and neighbours that are involved with turbines on their properties and the neighbour that is not involved but is affected by not being able to utilise their land, as was described before, in the way that they perhaps would wish to. A practical example is you have got a boundary and you have got, say, six wind turbines going along that and then the neighbours want to crop right up beside their boundary and they are not able to—and just a practical example—spray because of the turbulence caused by the wind farm and the proximity of the wind farm as to where the aircraft can actually go.

**Dr Prest**—In relation to what is sometimes claimed by opponents of wind energy in terms of a general planning principle of blight, there are some case decisions in Australia that deal with the aesthetics of wind farms and whether there is some principle in law of a planning blight. It has been held, for example, in the New South Wales Land and Environment Court that there is

no principle of generalised blight that you could apply to create a compensation liability. I guess what I am saying to you, though, is that if there was genuinely some interference with the property rights of one landholder by the actions of another on their land, the common law already established some principles in the law of nuisance, particularly private nuisance, that would enable a neighbouring landholder who was genuinely affected and could show their property rights had been affected to bring a nuisance action, but I cannot point to any nuisance actions relating to wind energy that have succeeded in Australia.

That may happen in the future, but I am just saying to you that if there genuinely was some substance to this alleged interference in property rights, then a court would apply the law of nuisance and, following the test in that law, that doctrine of law would then come to its decision. The question then for the Commonwealth parliament is whether it wants to step in in some way to legislate this specific issue relating to aerial spraying. As I said, I do not have particular expertise in the Commonwealth aviation law to tell you whether the Commonwealth already actually has legislative responsibility or regulatory responsibility to make standards for safe use of aircraft.

**Senator ADAMS**—That was just one example of how something might impinge upon the other neighbour because this is the sort of thing that one has been getting compensation and, as we have talked about, I think Senator Boyce said it was not the ugly neighbour syndrome but it was something really like that.

**CHAIR**—Jealous neighbour syndrome.

**Senator ADAMS**—Jealous neighbour syndrome. One neighbour was benefiting in one way and the other neighbour had not had the opportunity to do so. Local government is trying. In Western Australia, anyway, I think their changes come about on 1 July. At the moment local government probably tends to have the biggest say into whether or not planning applications should be accepted. That is really at the local level and then it goes to the state. Do you see any change in that? Where should the actual responsibility lie for the approval of the planning?

**Dr Prest**—I think if you look at New South Wales and Victoria, they have taken the approach that any wind energy project over 30 megawatts—so roughly 15 turbines or more—should be addressed at the state planning level. I guess the purpose of this is that if you place the responsibility for decision making at the local government level there are a number of dangers. One of them would be that local interests would, let us say, place a greater priority on local issues above state and national concerns, so that those local impacts would be given a lot greater weight than under, say, state regulation, where the state minister could take a more, let us say, balanced approach, considering weighing up local impacts and state-wide, nationwide and global benefits of projects. Obviously, the planning and environmental law in each jurisdiction in Australia and each state jurisdiction is different, however they sought in New South Wales and Victoria to create some consistency across the state by having the capacity to call matters in so that they are dealt with on the state level.

The other point I wanted to make, though, is that frequently—and I am not sure of the details of the evidence that has come before the committee—local government would say that it does not have the expertise in assessing all of the detailed specific environmental protection issues, and so therefore they do not want that regulatory responsibility. They would prefer that that was

left to being at a state level. The other danger is inconsistency, so that unless you regulate it state-wide and have state-wide laws, you could have in New South Wales, I think, 175 different sets of rules applying to wind energy. I would be surprised if that is going to encourage economic growth in the industry. I am suggesting that if you want to encourage that industry and you see that there are some benefits in economic terms, state-wide legislation is going to create a lot more certainty, which is something that the project developers need in order to obtain finance at a reasonable rate so that projects are viable.

**Senator ADAMS**—So we move up to the next level. How do you see the national guidelines? What should they be dealing with and are they there in an advisory capacity rather than in a regulatory manner?

**Dr Prest**—I think the point about these guidelines from the EPHC is really that they are not, in themselves, making out a case that the Commonwealth should have sole responsibility for regulating environmental issues associated with wind energy, they are just trying to create some consistency in the requirements across Australia. I guess it is about agreed best practice guidelines, but each individual state is free to decide how it wants to implement those guidelines. I suppose if that exercise turned out to be an utter failure and that there was no consistency arrived at as a result of it, the Commonwealth could review the situation in, say, three, four or five years time.

**Senator ADAMS**—Okay.

**CHAIR**—We are past 2.30, the time for finishing this particular session. I know Senator Brown has a question she would like to put on notice if that was possible.

**Senator CAROL BROWN**—I am just going to ask a series of questions about the setbacks, so if you could provide that information at a later date that would be good.

**Dr Prest**—Yes.

**CHAIR**—Do you have any other information that you would like to table?

**Dr Prest**—I would like to table a more detailed submission in several weeks time because I have some points in relation to the law relating to compensation and questions about possible amendments to the EPBC Act, so if I could have some kind of ruling on that?

**CHAIR**—That would be appreciated. We have asked other witnesses to get us their further work they want to table within about three weeks, so if that was possible that would be appreciated because we have got a deadline that we need to meet for our report. Thank you very much for coming and we appreciate your evidence.

**Dr Prest**—Thank you for the opportunity.

**Proceedings suspended from 2.33 pm to 2.52 pm**

**BEAN, Mr Nigel, Head, Generation Development, AGL Energy Ltd**

**McNAMARA, Ms Sarah, Head, Government Affairs, AGL Energy Ltd**

**REBBECK, Mr Matthew William, Technical Director, RES Australia Pty Ltd**

**ALONSO, Mr Guillermo, Technical Manager, Union Fenosa Wind Australia**

**DONOGHOE, Mr Matthew, Landholder in the Union Fenosa Wind Australia Crookwell 3 project**

**MITCHELL, Mr Thomas, Development Manager, Union Fenosa Wind Australia**

**MOHAJERANI, Mr Shaq, Engineering Manager, Union Fenosa Wind Australia**

**CHAIR**—Welcome. I understand that information on parliamentary privilege has been given to all of you, and on the protection of witnesses and evidence. We have a spare copy if anybody wants to peruse it. Before I ask you to make an oral submission, I will just mention—and I know some of you have been in the audience so you know this—the Senate is sitting. We have not had a division for a little while, which does not bode well.—in other words, there is potential for a division and we will have to leave. We will only be about five or six minutes. We will come back and resume. We were not expecting that we would be sitting now, but that is what happens in this place. I apologise in advance.

We have your submissions. Thank you very much. I would like to invite each of your organisations to make an opening statement and then we will go to questions. I know we have a longer time frame, but because there are a number of you could you keep your statements fairly short and then we can go into a discussion. We tend to run these fairly informally. If we are running on a particular theme, I would like us senators, if we could, to follow that theme and then we will move on to another theme. Is that okay with everybody? Who is going to start first?

**Ms McNamara**—We can go first.

**CHAIR**—Thank you.

**Ms McNamara**—AGL Energy welcomes the opportunity to make a submission to the Senate's inquiry, set up by Senator Fielding, into the social and economic impact of rural wind farms. As Australia's leading investor in renewable energy in Australia, AGL is well placed to comment on this committee's inquiry. AGL has in its portfolio of wind farm assets the set of five Hallett wind farms in South Australia comprising of five wind projects either operational or under development, representing some 510 megawatts of wind power.

Further, AGL and joint venture partner Meridian Energy have under construction of a 420-megawatt wind farm at Macarthur in Victoria's southwest at a total capital cost of \$1 billion. On completion this will be the largest wind farm in the southern hemisphere. AGL is also currently constructing the 67-megawatt Oaklands Hill wind farm in western Victoria, and we operate and

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buy all the output from the Wattle Point wind farm in South Australia, which is located near Edithburgh. That wind farm has a capacity of 91 megawatts.

AGL works closely with local communities in the planning, construction and post-construction phases of rural wind farm operation. In doing so, we have a lot of contact across entire communities with landowners, interested citizens, local councillors, MPs at a state and at a federal level, as well as community groups. The message we have for this committee's inquiry is that rural wind farms, properly planned and developed, represent positive impacts in the communities in which they operate. AGL believes that the wind energy industry is very significant to the economy of Australia and particularly regional Australia. The benefits of a wind farm to a local region are actually not confined to the initial investment in the project. They also provide a reliable source of future income for landowners, direct employment opportunities for locals, and flow-on employment for local businesses through the provision of products and services to the project and to its employees.

In fact, an independent study commissioned by AGL in 2010 confirmed that the regional economy in South Australia benefited greatly from the construction and operation of AGL's Hallett group of wind farms. This study found that for every job created by the wind farms at least three further jobs are created indirectly. Furthermore, regional expenditure due to construction and operations activities in Hallett totalled \$41.1 million in the last calendar year, with a further \$15 million per year expected for the operational life of the wind farms. An average of 98 construction workers have been employed on the Hallett project sites at any one time from late 2005 to June 2010.

In relation to health and noise impacts, AGL refers the committee to the federal government's National Health and Medical Research Council's public statement dated July 2010, which presented the current evidence relating to potential health impacts of wind turbines on people living in close proximity. The NHMRC's public statement concludes there is currently no published scientific evidence to positively link wind turbines with adverse health effects.

AGL notes that the committee is also interested in our views on the intersection between state and federal policy regimes. AGL operates in accordance with all relevant state and local council planning regimes. AGL is committed to ongoing consultation with local communities and the relevant state government about its wind farm projects. Federally, AGL welcomed the Senate's passage of legislative changes to the operation of the Renewable Energy Target scheme in June 2010. These changes have provided greater investment certainty for the renewable energy industry. AGL is proud of its wind farm investments in Australia, an integral part of which is the thorough community and environmental consultations it commissions for all of its wind farm projects. AGL submits to the committee that these investments are positive developments for the communities in which they are located.

**CHAIR**—Thank you.

**Mr Rebbeck**—Thank you for this opportunity to talk to you about wind farms. RES, the company I work for, is a global wind farm developer, owner and operator with over 30 years of experience. We have been involved in the development and construction of more than 5,000 megawatts of wind farm to date across the world. We have a strong reputation internationally for

developing world-class wind farms. Through an open and responsible approach we develop environmentally sensitive wind farms that have strong support from the local community.

The benefits of wind farms are many and varied. Firstly, wind farms take advantage of an indigenous, free and everlasting fuel source. This provides energy security and long-term price certainty. Wind farms are clean; they reduce greenhouse gases and particulate pollution also. Unlike fossil fuel generation, they do not require huge amounts of water to operate. Wind farms are by far the lowest cost, most proven, renewable energy technology available today and that is particularly true in areas of high wind, and Australia has a fantastic wind resource. Wind farms provide jobs, investment and general stimulus to rural communities.

I would now like to run through a number of the terms of reference to the inquiry. Firstly, I will go to any potential health effects, which have been talked about at length today. With more than 150,000 wind turbines operating globally, it would seem likely that any genuine adverse health effects would have been widely researched and published by now. However, we are not aware of any credible, peer reviewed, scientific literature that demonstrates that wind farms cause adverse health effects.

On to the NHMRC study that has been discussed at length today. Whilst they acknowledged that was a rapid review, it was a review that included a list of numerous peer reviewed papers. This is an Australia paper. We are a global developer. We have seen this health discussion being carried out over the world for a number of years now. There are numerous other papers that come to the same conclusion.

For example, the National Health Service in the UK in August 2009 carried out an assessment titled *Are wind farms a health risk?* They concluded that there is no evidence that wind farms have an effect on health or are causing the set of symptoms described as wind turbine syndrome. The group study by Pierpont was not sufficient to prove the claim stated.

In another review in the UK, specifically looking into the health condition known as wind turbine syndrome, a number of comments from that paper included, 'Dr Pierpont's use of epidemiological and statistical methods is seriously flawed. Dr Pierpont's conclusions are completely unreliable.' I thought it was worth just walking you quickly through the argument that is put forward by the wind industry against the adverse health effect, in particular the logic that is used by Pierpont and other people along the same lines.

An Australian acoustic consultant has carried out an assessment of Pierpont's work and they note that the Pierpont report is not peer reviewed and the hypothesis is based on the assumption that infrasound near wind farms are higher than infrasound levels in the general environment. This is key and it is what Dr Pierpont said on the audio conference this morning. She said that, in her opinion, the adverse health effects are caused by low-frequency noise. This noise consultancy has looked at what the levels of low-frequency noise are in the general environment compared with what the levels are at a wind farm. This was, in my view, a particularly informative study, and I believe you have been provided this information through other submissions. The results I have in front of me say an awful lot.

Talking about low-frequency noise in the Adelaide CBD, the measurement is in dBG, which is neither dBA nor dBC, critically, and which is the noise level specifically designed to measure

low-frequency noise. It is what you would use to assess the base levels of the noise and that is where we are with low-frequency noise. The dBG levels in the Adelaide CBD are, for example, 76 decibels; at a local beach, 75 decibels; a gas-fired power station nearby, 74 decibels; at a cliff face, 69 decibels; and then we are down to the wind farms, 67 and 63 decibels, at 185 and 200 metres downwind of the closest turbine. Of course, the nearest neighbours are normally much further away than that.

So, there is a fundamental issue here with the Pierpont research in terms of the levels of low-frequency noise. Nobody disagrees with the fact that high levels of low-frequency noise cause health impacts. There are numerous volumes of research that demonstrate that, from fighter pilots to truck drivers, who are exposed to high levels for long periods of time. Nobody disputes that. The levels of low-frequency noise from wind farms are nothing like the levels that can cause health impacts, and this research has been carried out numerous times. It is easy to measure and we get the same results. It is also worth noting that wind farms have many positive health effects. As I said before, they reduce greenhouse gases and particulate pollution.

The next term of reference, concerns over excessive noise and vibration emitted by wind farms. We talked about it this morning. Wind farm noise is very low when compared with the everyday environment. We are talking about levels of 35 to 40 decibels. If everyone was completely silent in this room and you measured the noise levels it may get down to 40 decibels at the very quietest. They are remarkably quiet. The first response you will ever get—and I always get when I take people to a wind farm for the first time—is they cannot believe how quiet they are. I do not know if all of you, or any of you, have been to a wind farm yet, but I strongly suggest you do. It is a fantastic way to experience the low levels of noise from wind farms.

It is also worth noting that the noise levels applied to the planning guidelines in the various states in Australia are amongst the most strict noise guidelines of anywhere in the world. In our experience, the rate of noise complaints at the wind farms that we operate is remarkably low and many of these are operated in areas where the noise guidelines are much less stringent than those in Australia.

In terms of employment opportunities, as well as the numerous direct and indirect employment opportunities created by wind farms, we strongly support the local communities in which we work and we support the use of local contractors wherever possible. In terms of farm income, wind farms provide drought-proof and flood-proof income to farmers. They also provide income to rural communities beyond the local farmers, with businesses able to take advantage of the opportunities that construction, operation and tourism bring. RES strongly supports the use of community funds and has very good experience across the globe of these working to the benefit of the wider community.

In summary, wind energy is clean, low cost, safe and quiet. RES considers that the current planning requirements are more than adequate to mitigate any impacts of a wind farm development. In consideration of this, along with the wider benefits of wind farms, RES believes that further restrictions on wind farm developments are not appropriate. This is particularly important if the federal government's 20 per cent by 2020 renewable energy target is to be achieved and implemented at low cost.

**CHAIR**—Thank you.

**Mr Mitchell**—Union Fenosa Wind Australia is the Australian subsidiary of Spain's Gas Natural Fenosa, which is a multinational company in the gas and electricity sector that has taken a leading role in developing the wind power industry in Spain. We were very encouraged by the number of submissions that were made to this inquiry, revealing that this issue is important to Australians and that this inquiry is certainly a worthwhile exercise. We are even more encouraged by the number of positive submissions that the inquiry received from the public. On an initial review, we understand that 62 per cent of submitting parties view wind farms in rural areas in a positive light. That was not surprising to us, as we understand from Newspoll that support for renewable wind energy in this country amongst Australians is in excess of 80 per cent.

We also understand that a large number of dissenting views to the inquiry were in fact from foreign parties that probably are not at the forefront of an important discussion within rural Australian communities, among the locals in those communities, about the merits of wind farm projects in rural areas. The people who are at the forefront of that discussion are people like Mr Donoghoe, whom we have invited to join us as a stakeholder landowner from our Crookwell 3 project. Crookwell is a small town just a touch north of Goulbourn, if you are not aware of where it is. It is very near to here. So, the people who are at the forefront of that discussion are people like Mr Donoghoe. They are our stakeholder landowners in the communities who have linked their support to the wind energy industry by writing submissions in their own words to express their support for wind farm projects, not just in their communities but on their land and in view of their homes. We received a number of submissions and I would like to take this opportunity publicly to acknowledge our stakeholders and thank them for their contribution and their continuing support.

Mr Donoghoe is here from our Crookwell 3 project. That is a project we have just shepherded through the process of testing the wind and preparing initial studies of the site. We commenced the planning approvals process by lodging documents with the Department of Planning a fortnight ago. The Crookwell area's economy is founded firmly on agriculture, but there are changing patterns of land ownership and subdivision in the area. There has been a wool bust and there has been an awful drought. Crookwell has an ageing and static population, and all of these things pose significant economic challenges to the regional economy around Crookwell.

We want to support that economy through our capital investment in renewable wind energy. There are 30 towers slated for the Crookwell 3 project, and its total estimated cost is going to be between \$90 million and \$110 million. We want to create 40 full-time jobs during the construction period for that project. We want to provide ongoing employment for six people during the operational phase of the project and then there is going to be contracting work for 10 people on an ongoing basis.

We want to skill up the locals in the Crookwell district so that they can work on future projects in the district, and there should be more projects because the district is rightly recognised by the New South Wales government as a renewable energy precinct where wind power can coexist alongside traditional agriculture. Crookwell is already hard working. They boast an unemployment rate well below national averages. We do not doubt that more employment opportunity will only boost opportunities for more people to come to that district. There are going to be multiplier effects that flow from our investment—work for locals in logistics, upgrading roads and fencing. We are already collecting business cards from local businesses that

want to share in the benefits of our Crookwell 3 project and we have not even received the construction permit yet.

There will undoubtedly be significant multiplier effects flowing from this increase in economic activity and from the local standing of ongoing lease payments that will be made to stakeholders in their local community. The benefits that Crookwell will see from our investment there will be equally apparent to the communities of Ryan Corner, Hawkesdale or Berrybank—our advanced Victorian projects—except the benefits there will be magnified because these projects are two and three times bigger than Crookwell 3.

Some parts of rural Australia have an historic opportunity to embrace wind energy, to bolster their local communities and augment their traditional strength in farming and agriculture. We really hope that this inquiry highlights that opportunity for farmers and their rural communities. We really hope that this inquiry galvanises support for wind energy projects and we really hope that it dispels the fear mongering campaigns of the anti-wind farm lobby.

This inquiry has an opportunity to educate the community about the safety of wind farms in their rural communities by dispelling myths surrounding arcane acoustics. We hope the inquiry also gives everyone a forum to air their views beyond the process already mandated by our planning authorities. Ours is a healthy democracy and we should not be afraid to have a discussion around facts, around well-founded science and around evidence based policymaking.

We are here to help highlight this historic opportunity for regional economies to the extent that we can. We should state up front that none of us is expert in every facet of every subject that has been raised in submissions to the inquiry, but we do point to sources that we trust that are represented among the submissions—the CSIRO, the Australian National Health and Medical Research Council and people like Peter Seligman from Cochlear, who was designer of the hearing transplant aid, an area of biomedical science which touches specifically on the interaction of acoustics with human health. These are all organisations that provide a strong and reliable basis for evidence based policymaking in Australia. They are the experts, they are independent and they are prepared to put their views on the record in the face of scientific scrutiny, too. So, these are the sources that can address and refute concerns regarding allegations of adverse health impacts linked to wind turbines, or claimed to be linked to wind turbines, that are driven by negative media campaigns.

In conclusion, we are very enthusiastic about the prospect for wind in Australia. This country has a very strong wind resource and many areas of open land. It also has a growing electricity demand and it recognises the need to develop a cleaner, less carbon polluting economy. We are prepared to commit our expertise and funding to projects using this proven mature technology in wind turbines and we know, from our Spanish experience, that wind energy can be a meaningful and substantial contributor to electricity supply in Australia. Most importantly, and in conclusion, we are prepared to invest in renewable wind energy at risk to our own capital at no cost to the Australian taxpayer and to the benefit of rural communities.

**CHAIR**—Did anybody else want to make an opening statement? Mr Donoghoe, did you?

**Mr Donoghoe**—No.

**CHAIR**—Senator Fielding.

**Senator FIELDING**—I am interested to know how you handle concerns from residents who live close by to existing wind turbines.

**Mr Bean**—We have a number of operating wind farms, particularly in South Australia—Wattle Point, Hallett 1, Hallett 2 and Hallett 4. We have arrangement where there are contact numbers available within AGL that are well-known in the community. People can phone us and essentially we are willing to talk and address their concerns and, if necessary, make further investigations. We have, for instance, in response to specific issues on noise carried out further monitoring of turbines for noise.

**Senator FIELDING**—I might come back to that answer if I can. I just want to keep on going with your, Mr Bean, if I can.

**Mr Bean**—Please.

**Senator FIELDING**—With respect to your existing established wind turbines, how close is the closest resident to any of them?

**Mr Bean**—I believe 1.2 kilometres would be the closest.

**Senator FIELDING**—Is it the home or the property boundary?

**Mr Bean**—No, that is the home, the residence.

**Senator FIELDING**—Any others closer than that?

**Mr Rebbeck**—We have been developing wind farms in Europe for a lot longer.

**Senator FIELDING**—Within Australia, I am talking about for the moment.

**Mr Rebbeck**—We have not built any—

**Mr Mitchell**—We do not run an operational wind farm at this stage, but the processes we use during the planning process, we provide people with a free call number and they can call and essentially speak with me about their concerns.

**Senator FIELDING**—Mr Bean, you said you have the closest one at 1.2 kilometres. How is that household? Are they happy or unhappy?

**Mr Bean**—That specific one, we had some noise complaints, which led us to carry on some additional noise monitoring, which has since led us to actually closing down some turbines while the turbine manufacturer carries out remedial works. So, we have responded to some concerns with that landowner.

**Mr Rebbeck**—If I can just add to that, because that mirrors our experience. As I said, with our operation of wind farms worldwide, which uses exactly the same technology as the wind turbines that are used in Australia, we have a very low rate of noise complaints. However, when we do have noise complaints, we take them very seriously and we go and talk to the landowners and we do further noise measurements as required. We invariably find that the reason for the valid noise complaints is that there is a mechanical failure with the closest turbine or a nearby turbine, so you are getting a tonal noise from that turbine. Tonal noise is picked up very well by the human ear. That is above and beyond your planning limits. You are effectively exceeding your planning limits. Once you fix that turbine and you correct that problem with the turbine and the turbines are operating within their planning guidelines, we do not have any noise complaints.

**Senator FIELDING**—Mr Bean, could you provide the committee with the complaint procedure process and how that is handled?

**Mr Bean**—We can take that one on notice and provide a submission on that.

**Senator FIELDING**—How close is the next house?

**Mr Bean**—We have a large number of turbines installed—several hundred—so I could not tell you much. But we have turbines 1.3, 1.4, 1.5 kilometres, quite a number at different distances.

**Senator FIELDING**—Say, out of the houses that are the closest, if you took the top 10 per cent of those, how many of those are happy or unhappy?

**Mr Bean**—Let me put it this way. Of the several hundred turbines we have operating we have only had one active noise complaint.

**Senator FIELDING**—No, I am talking about people who live the closest. If you live a long way away, you are not going to complain.

**Mr Bean**—As I said, that includes people who live the closest.

**Senator FIELDING**—I understand. My question was about those that live the closest—say, that the top 10 per cent of the people living the closest.

**Mr Bean**—I am unable to comment on whether or not people are happy. We have only had one active noise complaint, which we have addressed.

**Senator BOYCE**—What other sorts of complaints have you had?

**Mr Bean**—None that I am aware of. Let me correct that. We have had discussions about things like the state of access roads, and unsealed access roads, for instance. That would be one that comes to mind. I can think of no others.

**Senator FIELDING**—How many of the residents that are close by have you signed confidentiality agreements with—any, some or none?

**Mr Bean**—The only form of agreement that we sign is with our landowners where we enter into so-called agreements to lease, which defines our relationship where we rent land to install a turbine. There is an element of confidentiality on these. These are rental agreements, which have a lease consideration in there. We commit to keep those details confidential and not divulge them, just as the landowner commits to keep those arrangements confidential. The confidentiality arrangements refer to the components of the arrangement and they could in no way be characterised as gag arrangements. They are just standard commercial arrangements in a commercial lease.

**CHAIR**—Could we ask each of you what arrangements you require of landholders?

**Mr Mitchell**—Certainly. Again, we have a lease agreement with stakeholder landowners. There is only one commercial clause in that agreement which relates to confidentiality. It relates to the confidentiality of the wind data that we generate from our testing towers. That is very valuable intellectual property for our company. Our landowners are entitled to know some details of that data, but they are bound by the confidentiality clause they commit to in the lease agreement not to then go on and share that valuable intellectual property with others. It is a fairly standard commercial clause.

**Mr Rebbeck**—We have the same confidentiality clauses in our agreements and they are standard commercial agreements.

**CHAIR**—Can we be absolutely clear here. Do any of you have any gag orders or anything that prevents a landholder discussing any health effects they may or may not be feeling?

**Mr Bean**—AGL has no such agreements.

**Mr Mohajerani**—We do not have any agreements either. If anything, if there is a problem, it will show up through the complaint process that something is wrong, which is in breach of the permit anyway.

**CHAIR**—Thank you. I just wanted to get everybody on the record. Thank you.

**Senator FIELDING**—Others may have some other questions.

**CHAIR**—Did you have any other questions around the confidentiality issues? Let us clear that one up.

**Senator BOYCE**—No, but perhaps we could ask everyone to provide us with the number of complaints you have had and what they related to.

**Mr Donoghoe**—Complaints regarding noise for operating projects?

**Senator BOYCE**—Noise or anything else of that—

**Mr Mohajerani**—We do not have any operating projects at the moment.

**Mr Rebbeck**—In Australia we do not have any operational projects at the moment; worldwide, we do.

**CHAIR**—Mr Bean.

**Mr Bean**—Can I maybe just take half a step back to the previous question? I pointed out that our nearest resident or neighbour was 1.2 kilometres. That is our nearest non-financially involved neighbour. We actually have a number of landowners who are closer than that 1.2 kilometres, from whom, I might add, we have had no complaints of noise or other nuisance.

**CHAIR**—That is from your landholders?

**Mr Bean**—Financially involved, sorry. That is why I normally refer to the nearest non-involved neighbour.

**CHAIR**—Thank you for clarifying that.

**Senator ADAMS**—Just on—

**CHAIR**—On the confidentiality and the—

**Senator ADAMS**—Yes.

**CHAIR**—Okay.

**Senator ADAMS**—My question regards confidentiality during the planning process when you are actually looking at where the turbines are going to go and what properties they are going to go on, and just the confidentiality side of somebody agreeing to have so many turbines on their property and then their neighbours who will not be having any turbines on their property. Do you have any confidentiality clauses there as to the siting of the turbines?

**Mr Mohajerani**—We ask the participant landowners not to divulge that information. It is not in the agreement. It is just a request so that it does not raise anxiety within the community just to find out what it is until the final design is finished, so we do not have to go through multiple iterations to get the final design. They will find out what is really going to be lodged at the end, and so we do not like to, as I said, put out false designs or something that is still through the works at the moment. They can divulge that if they wish to. We just ask them not to until the final design is out.

**Mr Bean**—I think Mr Mohajerani has actually raised a point there where he mentions the final design. One of the issues why developers are often reluctant to issue maps showing where turbines are proposed until actual lodgement of a planning application is quite frankly turbines move around. You may start with a conceptual design for a wind farm once you have entered into agreements with landowners and may have identified a large number of potential sites. As you go through various siting studies and look at the entire gamut of constraints, which might include native vegetation, Aboriginal heritage, communications links, noise studies and shadow flicker, the number will change. You may not only remove turbines but as a result you may then redistribute them. Until you actually come to a point where you are able to lodge a planning

application, it is very much a movable feast. I have certainly seen confusion in communities where developers have issued a number of wind farm layouts, each one appears a bit different and inconsistent, and people become frustrated. In community consultation you generally wish to get out as much information, but it is a very difficult process to manage when you are actively designing a wind farm.

**Senator ADAMS**—Once the final design is announced, can you just tell me the process as to how the rest of the community are going to be able to find out where things are, what the problems may be, what sort of grievance process they may have, or for putting in an objection to the actual siting of a particular turbine?

**Mr Mitchell**—Conceptually, for instance in New South Wales, the planning scheme is built around a design and consult phases of preparation. You design and then confirm with the community. So, having put together a project, it is at the phase where the project is taking shape and it is a viable project that the community is then invited in to give their views. They are informed about what the project is and given an opportunity to submit their views for consideration.

**Mr Mohajerani**—When we do start the initial consultation en masse, we doorknock within a radius of the site just to make sure everyone knows what is there and we provide what we refer to as the wind farm zone where we think we can utilise the land and we highlight that zone. So, within that zone we will need to finalise the design, where it is acceptable and where it is not acceptable, and according to all of the standards and guidelines that are available within that zone. But the final layout, again when it comes out, we will send to the Department of Planning in New South Wales for adequacy checks. Through that period they might still have issues that need to be resolved. That still does not go to public notice. Once they are happy that we have addressed all the original requirements, it gets publicised for public exhibition for a period of four to six weeks, or whatever they determine, and then it goes to public notice and everyone will get to view it. Through that period we will have an information day to show everyone what the actual design is and they can ask the consultants who prepared those designs any questions they like about it and then they make an informed decision on that submission—whether they want to be for or against—and then the department of planning packages all those submissions, provides it back to the proponent for response. Once people respond to that through the various consultants, they deem if it is an adequate response or not.

**Mr Bean**—There are generally multiple opportunities for response. For instance, we have carried out open days presenting conceptual design early and design where we have sought feedback and then moved and deleted turbines and moved roads as a result of that feedback. And then as Mr Mohajerani said, there is then a process post lodgement of a planning application to receive submissions and feedback, which again can have further input on design at that stage.

**Senator ADAMS**—I know that you have to do all your planning as far as where the wind is and where the best possible sites are for wherever you are going to put your wind farm. As far as the consultation goes, you are looking at people whose property the turbines can go on and then the adjacent properties. Those people on the adjacent properties where there will not be any turbines are not told anything—

**Mr Mohajerani**—But they will know where the turbine zones will be, but not the actual final location. Again, every time there is an issue and something needs to be moved, all the consultants will have to revise their report to see if it suits them as well. So, you cannot constantly tell the community, ‘It is going to be here. No, it is not going to be here.’ It is going to cause anxiety for no reason. We just tell them where the zones are. We have released drafts to some neighbouring landowners, because they just wanted to know roughly what the closest one could be to their house. We just mark it as draft and send it to them just so that they feel better about how they are situated to that closest turbine. We just tell them, ‘Look, this may change. It is not going to get any closer, but this may change because the studies haven’t finished.’

**Senator ADAMS**—So, they are actually advised that something is going to happen?

**Mr Mohajerani**—That is right. The hotlines, the emails, the 1800 numbers, the phone calls—they can get in contact with us if they wish and inquire about it. We do provide information. It is just that we always tell them, ‘This is in draft mode. If you see something different ...’ We do not want to cause concern twice for them and cause anxiety unnecessarily.

**Senator ADAMS**—I have a question on setback with Transfield.

**CHAIR**—Can we move on to consultation. I promise we will come back. Does anybody else have any other questions on consultation?

**Senator FIELDING**—No.

**CHAIR**—Did we cover that enough?

**Senator FIELDING**—Yes, for the moment. Let some others have a go.

**CHAIR**—I realise we went over the confidentiality stuff. Have we done that enough? I just wanted to check that because we moved along from confidentiality and consultation. I just wanted to make sure we covered it.

**Senator BOYCE**—The Department of Climate Change this morning told us about the guidelines for best practice methods for setting up wind farms. Could you tell me whether your companies use those best practice guidelines or how you measure your performance against what is seen as the best practice guidelines?

**Mr Rebbeck**—We review all of the guidelines in the industry in terms of community consultation.

**Senator BOYCE**—Sorry, I am having trouble hearing, Mr Rebbeck.

**Mr Rebbeck**—We review all of the guidelines in the industry with a view to community consultation. We use our experience of developing wind farms in other parts of the world as well, to take that onboard. Our experience is very much that early and open consultation leads to stronger support from the community, and that is always our approach.

**Senator BOYCE**—Would you have any comments at all on those guidelines? Do they constitute best practice in the view of the industry?

**Mr Mohajerani**—I guess you can never have too much consultation. The problem is at a point you will have to see if your project is viable to proceed, and you can never please everyone. You can never please someone who does not like a wind farm, so if they tell you they do not want a wind farm there because they do not like looking at it, it is very hard to negotiate. So, there is a point where you think, ‘Well, they don’t have a valid merit in their concern’, but they are raising the issue. We have had various landowners and non-participant landowners provide us with feedback that was invaluable and it really highlighted the local aspect where we were at and the issues with it. It has been very helpful and we listen but it is very hard to please someone who does not like a wind farm just because they do not like a wind farm.

So, we do have to say that if a person or a group are consistently commenting that they do not want a wind farm in their area, it is very hard to consult with them. We have tried multiple times, but you just keep hearing the same thing and you think, ‘Well, tell us what it is.’ They will bring in various things that really are not necessarily relevant to their initial issue, but they just use that as an excuse to object to the project. It is quite frustrating from a developer’s perspective because you are trying to do the right thing and you are trying to address as many things as you can, but you can never satisfy someone who does not like a wind farm.

**CHAIR**—Mr Bean.

**Mr Bean**—I will comment on the specific guidelines. For each of our projects we produce a customised community consultation plan relevant for that project which takes into account local conditions. Those guidelines are one source that we have referenced and we tend to draw upon the experience of our consultants, for instance, and our experiences in other places. So, they are a source that we have drawn on; whether they are the best practice, I cannot comment on, but they are a source that we call upon our consultants to draw upon and produce in consultation plans.

**Senator BOYCE**—The department of climate change assured us this morning that COAG was of the view that these guidelines included best practice methods for establishing wind farms. Am I correct in sensing a lack of enthusiasm for these guidelines from the industry?

**Mr Mitchell**—Perhaps one concern is that where those guidelines are not in accordance with the state planning schemes we really need to comply with this as a matter of jurisdiction. The national guidelines diverge from state planning schemes in two key respects. In one sense, they refer to using measures for stringent testing for noise using the most advanced technology for noise testing and in another sense they also—

**CHAIR**—I beg your pardon. Which one uses higher standards?

**Mr Mitchell**—The national guidelines use a more stringent test.

**CHAIR**—So, why can you then not comply with the national one? Surely you can do better than the state guidelines. You do not get penalised by the state for doing better, do you?

**Senator BOYCE**—Is it a matter of cost?

**Mr Rebbeck**—In some cases they are inconsistent to the extent that one guideline will ask you to do a certain noise study in a certain way and another one in a different way.

**Senator BOYCE**—Welcome to the Australian federation.

**CHAIR**—That helps clarify it for me, because if it was just as simple a matter of having a higher standard, I would say, ‘We’ll go for the higher standard’, but if it is using two different processes. Now I understand.

**Mr Rebbeck**—They are contradictory. It is impossible to comply. Absolutely.

**Mr Bean**—Processes are different from state to state and that is one challenge that any developer has to embrace if it wishes to operate nationally. Certainly, taking on another set of guidelines which may well be inconsistent complicates issues, particularly when they are not necessarily called out by the state planning authority, for instance.

**CHAIR**—That was the first example that you raised. You said there were two.

**Mr Mitchell**—The second inconsistency is that the National Wind Farm Development Guidelines refer to infrasound, but then within those guidelines it, in fact, says that there is ‘no verifiable evidence for infrasound production by modern wind turbines and there are very, very few, if any, confirmed reported cases of infrasound noise emission problems from wind farms’.

**Senator BOYCE**—So, they are asking you to measure something.

**Mr Mitchell**—The guidelines refer to infrasound in a broad based way, but then within the guidelines they then say, ‘Well, infrasound is not proved to cause anything.’

**Senator BOYCE**—So, they are asking you to measure something that they themselves say is not an issue.

**Mr Mitchell**—Yes, it is not an issue. So, it is an issue of evidence based policymaking.

**CHAIR**—Thank you.

**Senator BOYCE**—Thank you. That was all I had in that particular area.

**CHAIR**—Senator Brown has got another consultation question.

**Senator ADAMS**—On that, yes.

**CHAIR**—I promise I will not forget you.

**Senator CAROL BROWN**—I actually wanted to ask whether you undertake, or have undertaken on your behalf, any community surveys in regard to community support for wind farms, or do you know of any that have been undertaken?

**Mr Mohajerani**—When we do our doorknocks, we have got a list of questions and we do the survey. We just ask everyone how they feel about every aspect of something that may concern them, and generally you find that the majority of people are either in support or they are not too fussed about it. I think there is a lot of misinformation out there at times that triggers a concern, so what we do through the doorknocks is we provide them information or references to information so that they can go and set their mind at ease. Again, there is no point us going somewhere where the majority of people are against the wind farm, but everywhere we have gone—every doorknock we have done—most people have been supportive or neutral. It is only usually a small minority that are quite vocal and they do oppose quite aggressively.

**Mr Bean**—AGL has had some doorknock attitude surveys carried out early in the development process, generally before we have had public open days held and, again, they have been generally overwhelmingly supportive of the development of wind energy.

**Senator CAROL BROWN**—So, the consultation periods with stakeholders and the community are quite lengthy. It is a long process to get a wind farm built. How long, on average?

**Mr Bean**—That is very hard to say. I think you can bracket it a little. We have had projects which you might describe as fast track which have taken around about two years to go through a development process from initial feasibility to permit, and then around about two years of construction. That would be the case for our Hallett 4 wind farm. Other wind farms have been developed, have gone through a permitting process and then taken five years before there was a commitment to construct. That would be our Hallett 5 wind farm, for instance. Certainly, other projects have had longer gestations in the permit process. Maybe my colleagues could give some examples.

**CHAIR**—We have a division. We will be back as soon as we can. Thank you.

### **Proceedings suspended from 3.14 pm to 3.51 pm**

**CHAIR**—We will resume taking evidence. Senator Adams has some questions.

**Senator ADAMS**—Transfield. I refer to a comment that you do not support the two-kilometre setback for wind turbines for residences. Could you tell me why?

**Mr Rebbeck**—You asked that of Transfield; do you mean RES Australia?

**Senator ADAMS**—You have obviously got turbines over in Europe, as you were saying. How close are they to people's residences?

**Mr Rebbeck**—I would not know the closest distance, but it is very typical to have turbines closer than one kilometre to homes.

**Senator ADAMS**—With this two-kilometre setback, you think they should be closer; is that really the reason you put that in there?

**Mr Rebbeck**—We have an issue with arbitrary buffer zones. We think the planning rules should be absolutely evidence based, based on scientific principles. We think the noise restrictions in Australia, as I said before, are the most stringent noise guidelines for wind farms of anywhere in the world. They tend to be the planning limits that set the minimum distance and we have very low levels of complaints across the world.

**Mr Bean**—The general method of planning assessment that we come across for wind farms, gas turbines plants, whatever type of development we make, is essentially a merit based assessment where your impacts on sensitive receptors, such as residences are assessed, and you have to plan around these limits. That is the normal approach. In fact, the issue of standardised setback distances was canvassed, I remember, in a New South Wales inquiry where the department of planning said, in general, their view was that they were not in favour of prescribing distances because in some instances the distances might not be great enough and, in fact, a case-by-case assessment should be made. So, in general, an approach that we find, when it is defensible technically, is a merit based assessment where your impact is assessed, be it noise, be it shadow flicker, whatever, and your design is limited by those defined merit criteria.

**Senator ADAMS**—With these new guidelines that are coming out you would rather have it that way than a standardised two kilometres or whatever? This is really the reason I am asking the question. Do you think there should be this two kilometre setback in all states or would you just do it on a merit based one, as you are talking about, taking into consideration gullies and things like that and that noise travels in different ways—or over water? That would be the better way to go?

**Mr Bean**—I think a merit based assessment will generally allow best and most productive use of land and that is why it is generally used across all industries.

**Senator ADAMS**—Mr Donoghoe, I am quite interested in your situation. Would you like to just give us a brief description of where you are at with being a farmer, how many turbines are going to go on your property and just how the planning process and the consultation process has gone for you?

**Mr Donoghoe**—We were first approached by Union Fenosa in their earliest capacity about five or six years ago, at which stage my family farm was in the midst of the worst drought in 100 years in this country, so we were quite willing right from the outset to look at the alternative of having a wind farm on our property. So, really, to nail it, we see it as a win-win situation for my family farm and for Union Fenosa, I guess without having to look too deeply into the things we have been discussing here, which are the community effects.

**Senator ADAMS**—Is the wind farm going to be contained just on your property or is it going into neighbours?

**Mr Donoghoe**—No, a number of neighbouring properties—myself and one or two neighbours.

**Senator ADAMS**—How has the consultation gone with the rest of the community and your other neighbours?

**Mr Donoghoe**—We consult amongst ourselves either via the bush telegraph, telephone or over the back fence and we are all still on good terms—those people who have and have not. I have a neighbour who is ambivalent to the wind farm and really does not care either way whether he has a turbine or not. I have another neighbour who is getting turbines and he is quite happy to have them.

**Senator ADAMS**—Do you have any neighbours that are going the other way?

**Mr Donoghoe**—Vehemently opposed? Not really. I had a neighbour who sold his property after generations of being there about three years ago and he was pro-wind farm but just left the area because of the drought. He sold his property. He saw his property as more valuable as cash in the bank than wait for a wind farm to come along. We have decided to do the opposite and hopefully everything will work out for us.

**Senator ADAMS**—And how close are the turbines going to be to you as far as your homestead goes?

**Mr Donoghoe**—The closest one is about 1½ kilometres.

**CHAIR**—Senator Brown.

**Senator CAROL BROWN**—You are obviously not concerned about the alleged health impacts?

**Mr Donoghoe**—No, because I think my colleagues here have summarised my position pretty thoroughly.

**Senator CAROL BROWN**—Thank you.

**CHAIR**—Senator Boyce.

**Senator BOYCE**—Earlier today it was suggested to us that the German model of starting wind farms from a federal government telling provincial governments, ‘This is what you need to do. You work out how to do it’, so that you ended up with community planning and, in some cases, community ownership of wind farms and that that would be a good model for Australia to look at. I am presuming that a not-for-profit wind farm sector would not be exactly your idea of the best way to go, but I would like your comment on how the ownership and whatever of this industry should be structured. This was suggested as community ownership getting around the jealous neighbour issue, so could I have comments, please?

**Mr Bean**—From AGL’s point of view, I think there is only one comment we would make there. We have no issue with the community ownership of wind farms. I think the greatest challenge of the renewable energy target is the sheer volumes of renewable energy, and hence sheer numbers of turbines, which would need to be deployed and which will lead to a need for the industry to spend literally billions of dollars a year as we head towards the back end of this

decade. So, whilst community ownership could play a part in there, I think it would necessarily play a very small part, given the size of the task facing the industry.

**Senator BOYCE**—Thank you. Any other comments?

**Mr Mohajerani**—I think what Mr Bean said is spot-on. We do encourage it because the more people you have onboard, the less upset neighbours you might have. I think one of the problems that we have seen is the higher cost of connection so that projects do seem to grow just to overcome the connection cost. I do not think you can get enough landholders to pitch in to have equity in such a large project and risk their asset, which is their land, on something that, again, with uncertainty in the market it could drag on for a long time, and it is not good for them because they cannot sustain it. That is why we have seen, I think up to now, two small community projects that have gone up and they have connected to very small lines and I think that is the extent. I think in Germany their regime is so heavily subsidised that they can overcome these costs and they are almost promoted to do these things, whereas here we are competing with cheap coal and it is not possible for the government to actively subsidise it, other than the RET scheme or possibly with a future carbon price.

**Senator BOYCE**—Would you see any issues around load planning if there were a substantial percentage of the industry owned by co-ops or whatever?

**Mr Bean**—Not really. The issue of management of load is now reasonably well managed because all wind farms are so-called semidispatched. They are controlled by the electricity market operator, EMO, and they can turn down the output of wind farms whenever necessary.

**Senator BOYCE**—My other question went to a suggestion made by the Aerial Agricultural Association this morning that the safest avenue to pursue here would be that wind farms would not be allowed in areas where low-flying aerial activities were likely to take place. I presume the industry has a view about that idea.

**Mr Mitchell**—Aerial agricultural spraying is very common on very flat lands which people use for growing grains and what have you. Typically that land is very flat. It is not heavily forested, so it means that the wind can actually flow at quite a high rate, which means it is a very good wind resource. You would certainly see a large overlap between areas that are agriculturally dusted and areas with a high wind resource, so you would be effectively banning large chunks of the best wind resource in the country.

**Senator BOYCE**—The association was also of the view that the majority of—and I hope I am not verballing them here but this is as I understood it—companies involved in wind farm development were not being cooperative in terms of marking where monitoring stations or turbines were located, therefore causing potential for harm to aerial operators. Again, can I have a comment?

**Mr Mitchell**—The gentleman representing the crop dusters, effectively, raised a very good point. There is a very real safety hazard for people flying low-flying planes. Aerial masts ought to be marked or at least flagged for their attention so they know where those very real hazards are.

**Senator BOYCE**—Are you saying marked on maps?

**Mr Mitchell**—The question there becomes a question of confidentiality. I mentioned before a key part of the process at the early stages of our projects is generating very valuable intellectual property for us, which is the wind data. That data needs to be collected over time and, essentially, by putting up a tower you are flagging, potentially, to competitors that you believe that there is a good, viable wind resource at that location. So, by putting everything on a map that is publicly available, you are belling the cat; you are telling everyone where you think there is a viable project.

**Senator BOYCE**—Can these monitoring towers be picked up on satellite? Can I Google them?

**Mr Mitchell**—I would believe not.

**Mr Mohajerani**—You would not see them very clearly because you would see a point from straight up. Just following on from what Mr Mitchell was saying, throughout some of our projects through the consultation process we did have aerial agricultural contractors ask us to notify them if any new masts go up so that they can look out for them instead of going in blind, so we have done that with the contractor. We cannot stop them from divulging that information, but we do not want to cause a safety issue, so we have notified them exactly where the turbine is in relation to the runways they use in the area. It is a better alternative than having them running into it, so we have done that. I think now, more and more, the masts do get higher and higher, so it is quite easy to spot them when you are driving along the road anyway; there is no point hiding anything.

**Senator BOYCE**—Mr Bean, how does your company handle this issue?

**Mr Bean**—I believe that we have supplied locations of masts to the Aerial Agricultural Association. We would have no issue supplying mast locations to some database.

**Senator BOYCE**—Do you think this is something that an organisation such as CASA, for instance, should administer?

**Mr Bean**—It would certainly be preferable for us if an organisation such as CASA had a clear and nominated group responsibility. I believe we supplied information to the Aerial Agricultural Association; that was on a voluntary and informal basis. We would have no issue if the process was more formalised.

**Senator BOYCE**—Does everyone agree with that view, or not?

**Mr Mohajerani**—I think Air Services Australia, the Aerial Agricultural Association and CASA are all informed when we do have one. Generally there is data and you can upload this information yourself. You go in just so that they are aware of it and they distribute that through their members.

**Senator BOYCE**—Thank you.

**CHAIR**—Senator Adams.

**Senator ADAMS**—As far as developers go, have your wind farms been able to actually hook straight into the grid through an existing line or have you had to actually supply a line yourselves or pay for a line to be constructed?

**Mr Mohajerani**—We have both options. There are areas that the line goes through our site and we have to build a substation and there are other places where you have to build a line to get to the line to build a substation.

**Senator ADAMS**—I am from Western Australia and I just note that the Meridian project has run into trouble there because their line is not big enough or strong enough, or whatever terminology you use for power going into a line, and they have come to a bit of a standstill. Could you comment on that as far as the environmental protection people are concerned? Who actually assesses whether the line is adequate for that particular output?

**Mr Mohajerani**—It is the network authority, which depending on the state could be various entities, but the environmental planning side is not in control of that. It is up to the proponent to do their homework and not spend millions developing a project if they have no capacity to connect to.

**Senator BOYCE**—That was really the reason I asked. It seems \$176 million is sitting there and the line is not adequate, so therefore it has come to a bit of a standstill. I just wonder why the planning was not done more adequately for that.

**Mr Mohajerani**—They can always upgrade the line. I am not familiar with the exact parameters they can operate it on, but it is most probably just unviable to upgrade it at this point in time because they just cannot sell their energy at a higher cost.

**Mr Bean**—I am sorry. I have no knowledge of this specific project, so I am unable to—

**Senator BOYCE**—I am trying to think of the name of it but I just have not got that with me, unfortunately. It is quite a considerable wind farm that is going up there. Anyway, I will check it out. Thank you.

**CHAIR**—I have one final question. I think everybody else is done.

**Senator BOYCE**—Can you remember what the name of that—

**CHAIR**—No, I cannot. Have any of you done health assessments of your own? You have given us your feedback on how you have reviewed the literature but have any of you done any health impact assessments?

**Mr Bean**—AGL has carried out no health impact assessments on wind turbine technology, gas turbine technology, hydroelectric technology or photovoltaic technology—any of the technologies we deploy—which are all well-proven technologies.

**CHAIR**—Thank you. Nobody else?

**Mr Mitchell**—It is not our core business. If health issues do emerge as a real issue; in our opinion it is, essentially, a hypothesis at the moment. For instance, Pierpont's position is, essentially, a hypothesis. It is certainly nothing we should be building evidence based policy around, but if it were to emerge it is certainly something we would have to look at.

**CHAIR**—If there are no final questions, I thank you very much for your submissions and taking the time to come in. I think there are bits of homework for people. Did anybody promise us any further information?

**Mr Bean**—AGL committed to respond with the details of its complaints/grievance procedure on the notification process.

**CHAIR**—Thank you very much. The committee will now adjourn and reconvene on Monday in Ballarat.

**Committee met at 4.10 pm**