COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY

Reference: Future water supplies for Australia's rural industries and communities

WEDNESDAY, 20 AUGUST 2003

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY

Wednesday, 20 August 2003

Members: Mrs Elson *(Chair)*, Mr Adams *(Deputy Chair)*, Mr Forrest, Mrs Gash, Mrs Ley, Mr Schultz, Mr Secker, Mr Sidebottom, Mr Windsor and Mr Zahra

Members in attendance: Mr Adams, Mrs Elson, Mr Forrest, Mrs Ley, Mr Schultz, Mr Secker and Mr Windsor

Terms of reference for the inquiry:

To inquire into and report on:

The provision of future water supplies for Australia's rural industries and communities, particularly:

- The role of the Commonwealth in ensuring adequate and sustainable supply of water in rural and regional Australia.
- Commonwealth policies and programs in rural and regional Australia that could underpin stability of storage and supply of water for domestic consumption and other purposes.
- The effect of Commonwealth policies and programs on current and future water use in rural Australia.
- Commonwealth policies and programs that could address and balance the competing demands on water resources.
- The adequacy of scientific research on the approaches required for adaptation to climate variability and better weather prediction, including the reliability of forecasting systems and capacity to provide specialist forecasts.

WITNESSES

Committee met at 5.06 p.m.

CHARLTON, Mr Terry, Chief Executive Officer, Snowy Hydro Ltd

DUNN, Mr Barry Rex, Executive Officer, Water, Snowy Hydro Ltd

CHAIR—I declare open the public hearing of the House of Representatives Standing Committee on Agricultural, Fisheries and Forestry inquiry into future water supplies for Australia's rural industries and communities. Today's hearing is the 20th of the inquiry. I would now like to call on our witnesses from the Snowy Hydro Ltd. Thank you very much for your submission and for being here today. Although the committee does not require you to give evidence under oath, I should advise you that these hearings are formal proceedings of the parliament and, consequently, they warrant the same respect as proceedings of the House itself. It is customary to remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Would you like to make a brief statement and then the committee would like to ask a few questions.

Mr Charlton—We have a presentation to run through fairly quickly if that is okay.

CHAIR—Thank you, yes.

Mr Charlton—As opening comment, we made this submission because, for some years now, we have been concerned about the deteriorating snowfall conditions in the Snowy Mountains. As you know the snow from the Snowy Mountains feeds into our catchments and dams. Those catchments and dams deliver water into the Murray and the Murrumbidgee systems. We have been working on this for some time. The severity of the problem, as far as we are concerned, is worsening. We believe we are in a 14-year drought sequence with seven years—or five years at least—to go. Everybody makes projections but we will show you something that tends to lean that way.

Because of the dependence of the Murray and the Murrumbidgee on Snowy Mountains flows—it works out at up to 33 per cent of the Murray's receipts and, in the case of the Murrumbidgee, it is up to 60 per cent—it is a very significant player into both of those river systems. We are talking about cloud seeding for snow augmentation. We are not talking about it for rain. That is quite significant, because we aim to—and believe we can—put snow into the catchments so that it comes off in September and then we store it for release at the appropriate times for irrigation for plantings and then, later on, for irrigation for finishing.

We do not see cloud seeding as a solution to Australia's water problems. It is a fairly localised solution, but a very important one, given the dependence we have on food and production in that Murrumbidgee irrigation area and down the Murray and the Murrumbidgee Rivers. In particular, we certainly support the need for environmental flows into those rivers. We also support the need for efficiency savings, but we take the view that while we are dividing up the cake and arguing about how it should be dispersed, it is important to try to build the size of the cake. That is exactly what we are talking about with cloud seeding.

We believe cloud seeding provides a win-win solution for the environment, for the Murray River, for our business and particularly for the dependent towns—not only in the irrigation area,

but for the ski fields as well—and they are very supportive. We believe the science is well understood, certainly by us. We believe we can deliver 100 to 150 gigalitres per annum down the Murray and the Murrumbidgee. As we have said elsewhere, that is one Olympic-sized swimming pool every five minutes of every hour of every day, extra, down the Murray River.

We think it is an urgent issue to be resolved and our board is prepared to spend up to $5 million per annum on this. We really do urge favourable and urgent consideration. We have special topographical and cloud physics conditions in the Snowy and, along with Tasmania, a very fruitful opportunity to cloud seed for snow augmentation. That is a quick summary of things.

CHAIR—Thank you very much.

A PowerPoint presentation was then given—

Mr Charlton—Let me address the issue of declining snowfall, because that is really where a lot of this assumption should start. We are not talking about lack of water, we are talking about lack of snowfall which, of course, translates to inflows. The graph indicating this is the one that disturbs us most. It was produced by our people over a long period of time. As you can see the data goes back 100 years. There are some actuals from the sixties onwards and extrapolations backwards. This is taken in the main range. It is a constant location and the snow pack is measured by centimetres per days. As I said, it is a constant measure across this time, so it is a good indicator.

The downward trend is very clear which is quite significant. If you extrapolate that down in a curve, a downward line, it suggests that between now and the next 25 years we are going to lose up to six per cent of our snowfall. That is what that graph suggests. It is also quite independent of what CSIRO are telling us, so it is fairly serious. Now, six per cent on that sort of graph it is pretty significant. That is extrapolating out to 2030.

The other thing we are very concerned about is the pattern here. When it is under the line, it is clearly below the average. You have several long periods here of effective dry sequence, or drought, including one coming from seven years ago. Statisticians can do their numbers on this but, ultimately, there is a clear trend downwards and an indication that we are still in a dry sequence —and may continue to be in one for a little time yet. The next five or six years, I think, are very important to us.

We are going to lose water. That is a secondary issue. That, of course, has some value impact, but the four per cent to six per cent reduction to 2030 is probably the most worrying aspect—as I said, independently arrived at—and a strong indicator that we have an urgent situation on our hands that will not go away in the short term. No doubt you well know the arguments about salinity and the declining ecosystems in the Murray and the Murrumbidgee and, clearly, there has been much discussion about the resource demands, so we will skip over those.

The ski industry is clearly suffering. It is a large employer and it is very concerned and interested to know if we are able to do what we are suggesting and be allowed to do it. It is important, but not just to the ski industry suffering from decline—

Mr SECKER—Are they prepared to put some money into it?

Mr Charlton—They have offered. We run into the issue there, if there are two hands in the pie, of who is going to be managing the cloud seeding and who is going to make the decisions. We are quite happy to do it. We have invited them onto a control panel so that there is good coordination and the opportunity to abort if there are problems or if they are concerned. They are concerned about it coming down as rain rather than snow. We are quite happy to respond to their concerns and stop seeding, if that should arise. They are happy to let us put the money in and sit beside us.

We are looking at a six-year experiment. We do not use the word 'experiment' among ourselves because we know it is going to work. We are very confident of that. But the word 'experiment' is there because we do want to gather data. We do want access to the park in a way that we can validate the conclusions that we are drawing and the confidence that we have. Clearly the board, after a period of time, is going to want to know that the $5 million or $6 million a year has been reasonably well spent. As you know, Tasmania has been cloud seeding for many years and achieving quite commendable results.

Mr Dunn—It is longer than 20 years. It has been seeding for 40 years but there is 20 years of seeding in that 40 years.

Mr Charlton—We are looking at the data for 20 years.

Mr Dunn—Okay.

Mr Charlton—Again, we are being conservative, but the 15 per cent results—

Mr SECKER—How successful do you think you will be at localising the snowfields? I imagine that surrounding farmers would not be particularly keen on getting extra snowfalls, or longer snow periods.

Mr Charlton—No. We are pretty comfortable. A lot of work has been done—and Barry can add to these comments—over the last 15 years or so, to position where the air will be heated, where it will be injected with the silver iodide, where the plumes will run, and we will be using radiometers to identify the clouds coming across. We have enough information and will have enough information about the wind movements and the orographic effect to pretty well position it. It is wasted if we do not position it. We are pretty keen to make sure it lands in the right place. We do not want it downstream, away from our catchment areas, so that when it melts we do not get the benefit of it.

Mr SECKER—Has a cost-benefit analysis been done which says, 'Okay, if we get a 10 per cent increase in snow, it will be worth so much to us in extra electricity generation'? Does the cost—

Mr Charlton—Yes, it does. That is why we are prepared to do it without asking for any assistance. The bottom line is that we are looking at a minimum of 12 events a year, up to 20. We are looking at an extra 15 centimetres in snow pack, an extra three to five days in fall—nothing more than that—which is well within natural variation. We are looking at 100 to 150 gigalitres

extra water run-off eventually and available for turbining. That means a revenue of somewhere around $12 million for the $5 million that we are prepared to put in.

Mr SECKER—Are you really looking for permission to do it then?

Mr Charlton—Yes. That is the problem.

Mr SECKER—Because you are prepared to go ahead and pay for it.

Mr Charlton—We are prepared to go ahead and pay for it. We have talked to the stakeholders, who are supportive. The challenge for us is getting through National Parks in New South Wales.

Mr SECKER—Yes, good luck!

Mr ADAMS—Is that because they think the silver iodide is going to fall on the park? It reaches the ground, does it?

Mr Charlton—No. They have had a number of issues and we have dealt with most of them. They are fairly difficult issues to pin down. The bottom line is they are not keen to see it happen—full stop, end of message. For example, with the silver iodide, we are talking about covering an area of over 2,000 square kilometres over the whole of the year and up to 20 events—so divide this next number by 20—60 kilograms of silver iodide. That is about the equivalent of a bucket, over the whole year, with 20 events. In addition to that, silver iodide is not soluble. It does not get into the water streams. It will not have any impact on fish.

Mr ADAMS—Does it stay in the soil?

Mr Charlton—It stays in the soil.

Mr ADAMS—It becomes bound up in the soil particles.

Mr Charlton—Yes.

Mr SECKER—What are they objecting to? What is their main—

Mr Charlton—They resort to the precautionary principle. In other words, if you cannot be absolutely sure that it is not going to cause problems, you do not do it.

Mr SECKER—We would never have had pasteurised milk if we had that principle.

Mr Charlton—We would not have a lot of things. It is a very difficult argument for us because we need a sense of urgency and leadership from the New South Wales government to get across the line on this. Bob Debus is supportive; Egan is supportive; the minister of fisheries and agriculture, Senator Macdonald, is supportive; but it is a question of getting them to combine that support a way which influences the National Parks. My own view is that this is a pretty important issue and, unless there is some very strong and measurable reason not to do it, I think the role of National Parks should be questioned.

Mr ADAMS—Does Parks think that it is not a natural act or something?

Mr Charlton—Yes. Even though it is well within natural variations, it is not a natural act.

Mr Dunn—They acknowledge it is a natural process, but they believe man should not have control over a natural process.

Mr ADAMS—When you say that, is that government policy in New South Wales? If it is not a natural act, then we do not do things?

Mr Charlton—I would not say it is government policy, but it certainly is the riding instructions and the framework in which National Parks operate.

Mr ADAMS—Thank you.

CHAIR—Have they checked with Tasmania? Tasmania have been doing it for—

Mr Charlton—They do not really want to know about Tasmania's experience, or the 100 programs operating in the USA every year—and around the world—and in South Africa and Spain.

Mr WINDSOR—When you say Bob Debus is supportive, how supportive? If he is supportive he would just tell National Parks to go and do it.

Mr Charlton—I would say he is supportive as in chicken-and-egg rather than pig-and-bacon. I think it is one of those situations where he believes, 'Yes, I hear the arguments but'—that is where it has all stopped.

Mr SECKER—He won't knock heads together in National Parks.

Mr Charlton—I cannot speak for what goes on inside there. Clearly National Parks has an act to operate under and they believe they are administering their act appropriately. We happen to disagree.

We mentioned the USA. Both Barry and I have spent time over there and we had experts over with us. We are very confident of the results that we will get. We also know, in our own micro or regional climate, that there are enough clouds coming across that can and will be identified and we can achieve that 10 per cent increase in snowfall. We may be able to do more but that is not the commitment; our planing scenario is somewhat less than that. Barry, is it six per cent we have done our sums on?

Mr Dunn—Six per cent run-off with 10 per cent snow pack increase.

Mr SECKER—There are about 100 gigalitres which go into the Murray-Darling now and you are saying an extra 100 gigalitres on top of that could come in?

Mr Charlton—We are saying an extra 100 to 150 gigalitres over and above what goes down there now.

Mr SECKER—It is about 100 gigalitres now, is it not, into the Murray-Darling system?

Mr Dunn—The diverted Snowy River waters?

Mr SECKER—Yes.

Mr Dunn—It is about 550 gigalitres each—to the Murrumbidgee and the Murray—so it is about 1,100 gigalitres in total, to both.

Mr SECKER—Okay, so this would be about 15 per cent.

Mr Dunn—That is right.

Mr Charlton—It may be. It is 100 to 150 gigalitres, so 10 per cent or 15 per cent.

Mr SECKER—Would that all go into the Murray and the Murrumbidgee, rather than the Snowy River?

Mr Charlton—Yes.

Mr ADAMS—And the five per cent to 10 per cent, what is that in the overall figures? You are giving up 11 per cent. What does the five per cent to 10 per cent increase in stream flows represent from your percentage point of view?

Mr Dunn—That is allowing five per cent.

Mr ADAMS—So it might make up for the loss of the present snowfall that you are—

Mr Charlton—Yes, of the supplies—

Mr ADAMS—In the next 20 years.

Mr Charlton—Yes. Again, these are pretty rubbery numbers.

Mr ADAMS—That is all right.

Mr Charlton—We have been fairly conservative in everything we have said. I will just stress this last point because, if we are right—and we are looking at the next five years being season on season of drought and we certainly picked the last year in advance—we must get this up and running for this time next year. We must be seeding now. To do EISs, go through all the machinations of approvals and talk to all the people to set up the safety valves we want, we really have to get this going in the next month or two. We have to get equipment made. We have to talk to a lot of people to make sure there are no concerns or suspicions, or to answer them where there are. It is urgent.

Mr SECKER—How much is diverted to the Snowy River now?

Mr Charlton—At the moment 38 gigalitres per annum.

Mr SECKER—Only 38.

Mr Charlton—Because we have not finished building the spillways to the dam. Under the water inquiry we have three years to do that. We are just into the second year. Then there is progressively up to 212 gigalitres going down there once and only after savings are found in the Murray River.

Mr WINDSOR—Who else would be opposed, other than National Parks? Would you have any problems with the farmers?

Mr SECKER—Greenpeace, conservationists—

Mr WINDSOR—Who else?

Mr Charlton—Let us go through them. The ski people were, but we have satisfied their concerns and they are now on side. Some farmers had concerns that we were taking rain shadow, or creating rain shadow for them. We have dealt with some of those and we have not got to others. The answer is no, we are not, because we are only seeding the postfrontal clouds; the clouds that never end up doing anything other than going out to sea. They are the big ones at the front that drop water on them, or do not drop water on them. These are clouds that have water droplets in them and, unless they have been inoculated, will not form ice crystals and will not fall out—and they will not fall out as rain either. There is an element of the farming community on the east coast that we still have to talk to, but I believe we can solve that problem.

After that it dissipates pretty significantly because a lot of the environmental groups, when they look at this, say, 'Hang on, we've got a much bigger gain here for the Murray River and for the ecology of the mountains.' This may sound frivolous but we have pygmy possums whose habitat is being reduced over the years—as you see there—and we are trying to correct that, so there is a very strong argument for it: it is well within natural variation and it is a redressing of what is happening. The environmental groups, I do not think, will be very strong. National Parks and certain ideologically driven environmental groups may be, but it is a very small group, full stop. The benefits downstream in employment and water to irrigation et cetera is pretty significant.

Mr ADAMS—Terry, is there any science being put up to say why not to do it?

Mr Charlton—No. This is over a long period of time. We have had some objections in recent times about driving a skidoo across snow to get access to measuring equipment. This will happen irregularly. That is the level of the debate. We could follow one of the National Parks people.

I have talked about the amount. Certainly we all get benefit out of this because anything going down the Murray and the Murrumbidgee goes through the generators so we can afford to fund this and it is a good return for the shareholders, which happen to be New South Wales, Victorian and the Commonwealth governments.

There is no doubt that, by that extra generation of 100 gigalitres, we are displacing greenhouse gases that would be otherwise produced from electricity, in the coal-fired and gas-fired power stations. I have commented on the ski industry and there is no question about their interest now. The river ecology: increased flow and reduced salinity speaks for itself. The irrigation communities: there are issues, clearly, of the living Murray and this offsets a lot of those issues, including alpine ecology—I mentioned the pygmy possums.

Very little is visible. The facilities—there are probably up to 20 of them, but it can be less—will be physically located near the road, so there is no endangering of the areas people do not have normal or ready access to. We will remove them following each winter. They are basically not much more than the size of a 40-gallon drum. The idea is that the air is heated into a gentle column; the silver iodide is injected into the rising column of air; it is a very small quantity that rises up until it starts to get the benefit of orographic effect. When the winds are over the mountains it goes up into the cloud and does its trick with the supercool water droplets, turning them into ever-growing ice crystals, until they fall out.

It is largely invisible and just a minute quantity. We will have electrical monitoring equipment at the ski resort so we can access storm events coming across. We will be including radiometers in that. We wish to do field sampling and that does require some access across the snow, but it will not be intrusive and it can be done gently. We have talked about the impact of an extra three or four days on the snow melt and 15 centimetres depth, well within natural variability.

Mr SECKER—Would they not really want three or four weeks, rather than three or four days?

Mr Charlton—Yes. Three or four days is hardly anything but the more important interpretation is that it is not going to change the breeding habits of anything.

Mr SECKER—And it will be more consistent than it is now.

Mr Charlton—And consistency, yes.

Mr SECKER—That is of more benefit.

Mr Charlton—You well know these points and I do not need to go through them. I would like to stress that we will have fail-safe systems in this. We will have rules to halt seeding when snow depth and reservoir levels are too high, or when there is imminent rain instead of snow, or during extreme weather conditions. We can, in a very hands-on way, manage what is actually happening and protect the environment from any detrimental outcomes which might be outside our control but that we are making worse if we are seeding.

To conclude, there is a long history of cloud seeding. As you know, the USA has used cloud seeding for many different applications: hail suppression, fog dispersion around airports and water and snow. We are fairly comfortable with the technologies and with our belief and confidence that we can get a return on the money we are spending.

Just a little quick history: we do go back beyond 1993, but an EIS was prepared and a number of issues were raised. They were dealt with, but it did peter out because there was not a will to

pursue it. We revised that program in 1997, answering those questions. Again, because of the corporatisation process and the difficulties—and, in fact, it was only us who believed that dry times were coming—we did not get a lot of response, so we backed off and did other things. I do not think we can afford to back off any more.

In summary, Parks and Wildlife in New South Wales does seem unwilling to consider the benefits. The facts now are that our scheme storages are low and our projections are under drought conditions for the next few years. I think we are facing up to some serious and significant reduced releases to irrigators. Last year we allowed them to borrow forward and this year we are doing the same, but there will come a time when we will not be allowing it. I think if we do not get significant rain and snow next year, then we will not be allowing borrowings—and they will not want to do it—because they will, in effect, be in hock in water terms, beyond what they feel comfortable with. Where we have been able to help them in both the Murray and Murrumbidgee—and the rice growers—in the last three years, we are coming to the end of that. That is very significant.

We must get up and running next year. We have done a lot of work in anticipation and we are quite comfortable with the fact that that homework is proving what we want and it is quite sophisticated. We are updating the EIS in case we do manage to talk New South Wales into a fast-tracking of approvals, under whatever circumstances, but we do have a six-month lead time, so time is of the essence. We challenged National Parks and they promised they would get back to us to spell out the legality of their position. They sought legal advice but they have not been back to us.

CHAIR—Thank you.

Mr FORREST—I am well researched on cloud seeding, as you are aware. I apologise for being late. I have been defending your position on the ABC.

Mr Charlton—They have been chasing me, too. I turned my phone off and said I was otherwise engaged.

Mr SECKER—I have the Murray River from Swan Reach down to the mouth, so I am always very interested in getting good, clean, non-salty water from the Snowy River scheme coming into the Murray-Darling system.

Mr Charlton—I think we are trying to get an extra 50 gigalitres to you over the next six months.

Mr SECKER—That would be very nice. Thank you very much.

CHAIR—We are open for questions.

Mr SCHULTZ—I am astounded, but not surprised, to hear that the National Park and Wildlife Service are challenging what you are proposing, in an environment where—as you quite rightly pointed out—if we do not get heavy rains until the spring we will have massive problems this year, let alone next year.

Mr Charlton—Yes.

Mr SCHULTZ—What is your next move? Where do you go from here, if you cannot get an answer from the National Parks and Wildlife Service? Have you done any lobbying of the New South Wales opposition or government members on this issue?

Mr Charlton—No, we have not. I have talked with Egan about it one to one and he is supportive. I have talked to Ian Macdonald and he is very supportive. We are preparing a paper for him on the way forward on some of the issues. I have another meeting with Bob Debus the week after next. I am just going to say, 'This is crunch time. Something has to happen.' For various reasons I have either backed off or I have said, 'Yes, we'll supply you with a bit more information.' That has delayed the process, but we are at the point now where we just need to say that it has to happen.

I do not know what is going to coalesce the views in the New South Wales government, other than publicity that can be raised—the ski fields are writing and talking about this, and the farmers who see the real need for it—the Murrumbidgee irrigators and the Murray irrigators. Quite frankly, I do not know what else to do.

Mr SCHULTZ—Can I suggest to you, if you have not already considered it, to seriously address the issue of taking a briefing up to the state opposition and filling them in on what you are doing. If the New South Wales National Parks and Wildlife Service have some sort of environmental concerns, they are not dissimilar to the environmental concerns they had against hazard reduction in the National Parks and Wildlife Service areas and, as a result of that, they destroyed more of the ecology than otherwise would have occurred.

Mr Charlton—Many of our people were out there fighting those fires, which should not have happened, in many cases.

Mr SCHULTZ—Yes. I would like to commend you for this. I know my parliamentary colleague, John Forrest, has been a very passionate advocate of cloud seeding and a lot of other members, including members of this committee, have an interest in it. I can only encourage you to keep going, because it is a very serious issue that can give enormous benefits to the community.

Mr Charlton—We will formally do that. I have spoken to John Brogden and I have talked to Duncan Gay in their time, when they had some particular interest in this, but it is very hard to get past National Parks when they resort to the issue of their act. We will have QC advice in the next two weeks and that, I hope, will precipitate some strengthening of the validity of our position.

Mr WINDSOR—I think you have partly answered the two questions I had, in answering Alby. The first question was: why are you here and what do you want us to do for you, or is it just part of the pressure mechanism? The second one relates to a lot of research that was done many years ago in the Snowy in relation to cloud seeding. A lot of that research was cast aside and the scientific method was disputed and a number of other things. Are they the sorts of question marks still over your shoulder in relation to the technology?

Mr Charlton—No, I do not believe they are. I have approached this differently. Quite frankly, I think we are past the point of trying to run experiments. If the board is prepared to put the money up and I am prepared to stake my reputation that this will work, then I think we should go ahead and gather what data we can, but if we get the benefits they will be there for all to see. We can get too scientific and we can fall into a paralysis the more we go around in circles worrying about whether the science is at 0.01 or 0.001 or 0.02 level of significance. Quite frankly, in business, I do not think that matters all that much.

Mr WINDSOR—No. I do not only ask the question because this is a water inquiry; I ask the question because of your particular project. Some of the research done back then has had very important implications about cloud seeding generally.

Mr Charlton—Yes.

Mr WINDSOR—I asked the question as to what information you had to refute that, or have you just charged on regardless?

Mr Charlton—It is supportive. It supports what we are trying to do.

Mr WINDSOR—The previous scientific information?

Mr Dunn—The review that Ian Searle ex-HEC, undertook of that data, in reassessing it he believes they got a 17 per cent increase. He believes they did not evaluate it properly.

Mr WINDSOR—The CSIRO believed the scientific method was incorrect or something at the time, did they not?

Mr Dunn—There were doubts over the design of the experiment, yes.

Mr Charlton—I do not want to criticise CSIRO but there is a degree of scientific perfection that probably is not all that relevant and it is a bit like throwing the baby out with the bathwater.

Mr WINDSOR—Do you want to answer the question: why are you here?

Mr Charlton—Why we are here? The first reason is that we are the ones bearing the brunt of failure—unfairly—to deliver water down the rivers. We have to be the ones who do the deals with the irrigators. We have to face their distressed circumstances. We have done that well. We can see a time, not too far off, where we will not be able to do that. Instead of the debate going on about the academic aspects of the water, we think there is a real need for somebody to increase the size of the cake—and it is in our best interests as well, not only politically, but we believe it is right environmentally, commercially, and socially. We want everyone to listen to us. I have stuck my neck out a bit on this for the board and I really do want to see it flow.

Ms LEY—I think I should place on record what great corporate citizens Snowy Hydro are at the eastern end of my electorate in the Snowy towns—and the outstanding action they took during the recent bushfires, probably well known to my colleague, the member for Hume—and the high opinion the people in those towns have of Snowy Hydro.

Mr Charlton—Thank you. I will pass that on to our people. It is important to them.

Ms LEY—It is very important and I genuinely mean it. This is obviously an excellent initiative. I do certainly bow to the member for Mallee's knowledge on cloud seeding because he has done a lot of studies on it. I would like to ask—because you are, of course, huge stakeholders in the Murray—your opinion of the state of the health of the River Murray at this time.

Mr Charlton—I am not sure I am qualified to answer that. I tend to think—and Barry and I have probably got different views on this—it is not as bad as some of the debate indicates. I think there has been improvement. There certainly has been improvement by farmers. I have been there and I have seen what they are doing. I think there is a great deal of desire and goodwill to improve the conditions of the Murray, but there is a long way to go. I do not think it matters whether it is X bad or Y bad; it is bad enough to be wanting it substantially better.

Ms LEY—Yes. You may have covered this earlier—and I apologise because I was late—but this dot point:

Snowy Hydro will lose 11 per cent of its present turbine releases by 2012 as a result of environmental releases.

Is that because there are existing environmental releases, the timing over which you have no control?

Mr Dunn—It is as a result of the outcomes of the Snowy water inquiry.

Mr Charlton—Which we are committed to send down the Snowy, yes.

Ms LEY—And you are locked into a time program.

Mr Charlton—Locked into that, absolutely.

Ms LEY—With those releases. Given that I do not believe the infrastructure fund has been formed yet, do you see that you meet out of your reserves the first few years—is that right—before the infrastructure fund kicks in?

Mr Dunn—That is correct.

Mr Charlton—We have three years where we are sending 38 gigs down as a borrow, to bridge the period until we finish spending the $60 million to build the Jindabyne dam spillway, the extra spillway. At the end of that time, efficiency savings are meant to be found, in which case we will then—to the extent those efficiency savings are found—divert water down the Snowy River.

Mr SECKER—Should we be diverting water down the Snowy?

Mr Charlton—I think it is a fairly valuable product to be sending down for some limited environmental advantage.

Ms LEY—That is one of the few things you and I would agree on about River Murray issues, is it not?

Mr SECKER—Absolutely, yes.

Mr Charlton—If we had plenty of water, I would not have a problem.

Mr SECKER—Yes, exactly.

Ms LEY—This might be a bit unfair, but you know there is a difficulty in the relationship between the irrigators further down the Murray—and I am sure on the Murrumbidgee—and Snowy Hydro. I am hoping that the amount of water that has gone into the catchment in the last couple of weeks might get us out of gaol, but you would probably know more about that than I do. Is there any assistance you can offer them in this coming year in terms of relaxing the requirements of the borrow, or in making some additional water available?

Mr Charlton—We are extending the borrow for another year, bottom line.

Ms LEY—Will that involve any financial cost to them?

Mr Charlton—Yes.

Ms LEY—What sort of financial cost?

Mr Charlton—It depends on what sorts of deals they take up and which ones they are. It is fairly significant. We are the ham in the sandwich, in a sense. We have three shareholders that expect us to generate electricity at the appropriate times, because the communities depend on us for peak power. That is fairly high-priced electricity, as you know. If we are to let water go to suit the irrigation requirements, that never corresponds with letting it go to suit the peak power. We have a conflict there. If we are to charge an opportunity cost, it is somewhat higher than we are charging the irrigators, so we are trying to find somewhere in the middle. It is not subsidised, but it is not the full price that we could charge and we are obliged to charge a full opportunity cost, in effect. It is still competitive, very competitive with the market; substantially less.

Ms LEY—I do not know if these are rumours, but there are discussions people are having about the privatisation of your company or the selling of the assets; something that I constantly say is not happening, but can I ask you about that?

Mr Charlton—We do not know anything about that; honestly, we do not. That is a shareholder matter. The shareholders do not discuss it with us, nor do they need to and probably would not. I pass no judgment on that, other than we went through corporatisation seamlessly without anybody feeling any difficulties. If privatisation ever happened we would do that also. In many ways private sector would be better owners than governments, especially for the irrigators, because we would be freer to do other deals. I see that as a positive, but I have no inclination that it is likely to happen.

Ms LEY—Of course, we do operate in a globalised world economy, but the thought of 17 dams in the Snowy Mountains being owned by, for example, the French is not a good thought, is it?

Mr Charlton—I would not be here; I would not work for the Americans. I think that would be very difficult. It would not be saleable. In my view it just would not be saleable; it is too much of an icon. You know what we did with the Murrumbidgee irrigators. We were invited to be recognised at a civic reception in Leeton, simply acknowledging what we had done with Dick Thompson. There was no doubt we kept that town alive by the extra water we delivered, of our own volition; we did not have to. There was always negotiation on price but at the end of the day they saw the value.

Ms LEY—But it was the maintenance that needed to be done on the Snowy-Murray tunnels that meant that similar opportunities could not be made available.

Mr Charlton—No, not at all. They could have if Bill Hetherington had chosen to talk to us earlier instead of leaving it to the last minute, when it was too late to do anything. The MDBC were also told about that well in advance, so they have no reason to blame us. In fact, we warned them five months in advance that they were heading for a problem.

Ms LEY—Do you think MDBC had sufficient information as far as the volumes of water that they get from you to know that?

Mr Charlton—Yes. They were told. They were given indications over and above our normal water report.

Ms LEY—Do you see necessarily the same thing happening again this year? We are obviously not going to be in a good situation.

Mr Charlton—If Bill Hetherington talks to us earlier, no, it will not; if the MDBC listens to us, no, it will not.

Ms LEY—Have either of those talks commenced to date?

Mr Charlton—Yes, both MDBC and Murray and Murrumbidgee. We have virtually done deals with the Murrumbidgee. Have we done deals with the Murray?

Mr Dunn—We rolled over the borrow.

Mr Charlton—Yes, that is right.

Ms LEY—As New South Wales is the majority shareholder in the Snowy—

Mr Charlton—One-third vote.

Ms LEY—It is only one third? That was my question. Do they have more clout at board level, shareholder level?

Mr Charlton—No. First of all, there is one-third vote for each of the shareholders, irrespective of their share of capital. More importantly, it is a corporations-owned entity company, corporations law entity, and therefore the board has to respond in the best interests of the company, not of the shareholders. It is explicitly not a SOC or a GBE, or whatever you like to call it, of any one government. The board determines the dividend, the strategic plan and acts in the best interests of the company, not in the interests of any one shareholder. It is quite unique.

Ms LEY—Is there sometimes a difference between the interests of the company and the interests of the shareholders?

Mr Charlton—Very often, because there are three shareholders who have different views anyway. In many respects, it is a unique corporate structure, government structure.

Ms LEY—Thank you.

Mr FORREST—I will go right to the issue of the cloud seeding demonstration. Thank you so much for being willing to offer a demonstration. I will not revisit the sad history of demonstrating the efficacy in Australia of cloud seeding over the years. I have just come from a public debate—on the ABC—with one of the member for Farrar's mayors at Tumut, defending your position of an intention to cloud seed. Most of the opposition is emotive.

Mr Charlton—Yes.

Mr FORREST—The very mention of silver iodide and people freak out. The scientific reality is that they are concentrations at not much more than normal, naturally occurring limits.

Mr Charlton—That is correct.

Mr FORREST—We badly need in Australia a properly planned, properly scientifically supported demonstration, not just a quick fix, seed the clouds and then have an argument about whether it had any result. We need a properly documented case over a long period of time.

Mr Charlton—Yes.

Mr FORREST—It is about statistics: a statistically variable entity in weather; 100 years of record and a one- or two-year demonstration; you will never get beyond a 98 per cent or 95 per cent probability that you have made a positive outcome. A pure scientist will say, 'That is not good enough.' That is the problem in Australia.

Mr Charlton—Yes, but a businessman says, 'Give me a 98 per cent probability and I'll pay for that.'

Mr SECKER—Absolutely.

Mr FORREST—I am pleased you have been following me around, too. I am recently back from Israel. There is world-leading research in the use of satellite imagery, the use of good old sodium chloride to get away from silver iodide, as the Texans are using. What I would like to suggest is that you have a properly designed, internationally observed demonstration and get the

good science and bring the CSIRO along with you. I am absolutely convinced, from what I have seen internationally, we have just dropped the football here.

Mr Charlton—There is no question of that.

Mr FORREST—Much of the resistance can be argued.

Mr Charlton—We have no problem, if we can get up and running, meeting the scientific requirements. We have no problem with that at all. That is going to, however, provide a very useful opportunity for National Parks to say, 'You can't have people going in there measuring this or measuring that.' I just mention that we would like to do it that way. Clearly, the board is spending $5 million a year and they would like to know that it is a best practice methodology and that we are getting results and all that sort of stuff.

Mr SECKER—What is the opposition to going in there and having measuring devices?

Mr Charlton—It is people walking in the park.

Mr SECKER—So bloody what?

Mr FORREST—It is aesthetics; the fact that it is fixed, stationary equipment.

Mr Charlton—But we would move them out.

Mr FORREST—It is not aerial, it is fixed from a stationary piece of equipment.

Mr Charlton—Yes.

Mr Dunn—It is actually the monitoring of snow. There are no rain gauges up above the snow. There is a location where you measure snow. It is fairly unobtrusive.

Mr SECKER—What is the problem?

Mr Dunn—Accessing it by some means that makes noise.

Mr Charlton—We can follow one of the National Parks guys on their skidoo and you would not even know we were there.

Mr SECKER—It is all right for them to go out there, but nobody else.

Mr FORREST—Are you able to describe yet the nature of the scientific support you will put around it? I know we have missed this winter—and I was disappointed—but do we have time for next winter to design it properly, set all the parameters so there is no argument at the end, or is it still too early for you to describe what—

Mr Charlton—No.

Mr Dunn—You are probably aware that we propose using tracers; a chemical tracer to indicate that the seeded snow is, in fact, as a result of the silver iodide, so there is both a chemical and a physical way of determining the seeding effect.

Mr FORREST—That is Professor Warburton's approach.

Mr Dunn—That is correct. Part of the program is to use the statistical basis—based on two seeding events and having one unseeded event on average—and that is the reason behind the six-year program, so you get enough statistical meaning in that program. It would have both a statistical basis and the physical and chemical. It would be a means of relating that statistical—which the CSIRO adopts and recognises—against the chemical and physical means that the Americans accept quite readily.

Mr SECKER—The only worry about it is if you are going to six per cent because of global warming and you are going to get perhaps six per cent increase, it balances it out and you might argue that perhaps global warming was not there anyway, so it was not a success at all. How do you get over that?

Mr Charlton—There will always be that debate, I suspect; no matter whether it is at the 0.001 level of significance or not, the results are discovered. As business people, as people who know the mountains, over five or six years I think there will be enough evidence to suggest it. It may not be perfect in a scientific outcome sense, but in a business sense I am pretty sure it will be.

Mr FORREST—A business approach is that a 95 per cent confidence limit is better than Tattslotto, but it is not good enough for a scientist.

Mr Charlton—No, but I have to say we are not all that concerned about proving to the scientists that it works, quite frankly. We will have a problem next year and the year after and the year after. If we can put in place enough data gathering so that with hindsight or retrospectively people will be able to come back and say, 'Yes, this was a good experiment. The methodology was set up properly and yes, the results look pretty good,' at what level of significance is another debate? We are facing a problem next year and the year after. Quite frankly, I do not want to spend a year debating with the CSIRO whether we structure it this way or that way. It is a bit like analysing while Rome melts, quite frankly. We will do that, but I do not want to see this held up or criticised at the margins when, in fact, in many respects 90 per cent would be happy with that. If we get 10 per cent, or whatever the outcome is—and we are being conservative—then it will be fairly obvious.

Mr FORREST—The other question goes to the real problem with Australian clouds on the mainland—that is, the impact of pollution in the clouds. The committee has had evidence on this. I specifically followed this up in Israel; followed it through specific programs associated with the Snowy Mountains, associated with the western flow of Melbourne and Latrobe Valley power stations. Will you somehow incorporate an investigation of that? I think it is an important question. It affects the rest of the nation.

Mr Charlton—I do, too. But, again, I do not know that it is our brief to do that. If somebody wants to assist with some data gathering, that is fine, but I am not sure that we are persuaded by those arguments. We have seen all our own stuff.

Mr Dunn—I am not sure we could do anything about it anyway.

Mr Charlton—What are we going to do about it? We cannot shut down Port Pirie and other places.

Mr FORREST—It is an eminently solvable problem—which the Texans are on to and so are the Israelis—it is not serious; it can be fixed.

Mr Charlton—But it is a bit outside—

Mr FORREST—What I am seeking is a willingness to cooperate. If we are able to extend your demonstration to incorporate better evidence on that very important issue, would you cooperate fully?

Mr Charlton—Yes. The data gathering is satellite based anyway. There is no difficulty in having that running in parallel with something we do. There is no problem there. As I said, we talk to Aron regularly. There is no difficulty there.

Mr FORREST—Can we be briefed on progress? We badly need you fellows.

Mr Charlton—Yes. We felt a bit isolated in this exercise because it is hard to find the point where the red button is to switch it on and get things happening. Likewise, we need you, too.

Mr WINDSOR—Have you attempted to speak to the New South Wales Premier?

Mr Charlton—No, that is my next step, but I have to be fairly cautious about that, given ministers' public positions.

Mr WINDSOR—Yes, I would encourage you to do that because one of the barrels that may get you some attention would be the additional water into the system. There are a number of pluses in terms of that.

Mr Charlton—Yes.

Mr WINDSOR—Having been in the New South Wales parliament for 10 years, one thing—and I think John was hinting at it a bit, too—is that they are probably more likely to at least have a look at something that is within some scientific parameters. Personally I think you have got Buckley's with just a, 'Roll up and let's have a go.' You will be talking, in 10 years' time, about the same thing.

Mr Charlton—We have given them scientific data and Ian Macdonald has been very interested and has gone through it in some depth. He is very positive. But the same data went to National Parks and I would have to say that they were underwhelmed.

CHAIR—Did the CSIRO—no doubt you have spoken to them—just close up on scientific—

Mr Charlton—No. In the last trip Barry and I did around the Nevada area, to the institutes there and talking to people, we had a CSIRO guy with us sharing the data gathering. I suppose we were a bit disappointed. He seemed enthusiastic when he got on the plane but when we got the report, after he had been to Melbourne, it was less than enthusiastic, so we are not quite sure what happened there.

CHAIR—Did you have further discussions with him to see why it stopped there?

Mr Charlton—No.

CHAIR—It seems logical that if you could get them on board to—

Mr Dunn—He seemed to work with us, but they are very keen on the statistical approach, which we would incorporate in this design anyway. I do not think they are too diametrically opposed.

Mr Charlton—We are not too far away from them, but they seem not to want to be seen to be supporting, or aggressively supporting it.

Mr Dunn—Good summary.

Mr FORREST—The CSIRO have moved on a little bit. They are now publicly talking about the potential for a cooperative research centre on the whole issue of weather modification; that it would need commercial partners. Would the Snowy, along with Hydro and Tassie, be willing to be a partner in something like that?

Mr Charlton—Yes, clearly, we would. Yes, we would support that sort of thing. Can I ask you what happened today at some other time?

Mr FORREST—Yes. You will get a transcript. I stuck up for you.

Mr Charlton—Okay.

CHAIR—Thank you both very much for coming along and giving us your time today.

Mr Charlton—Thank you all.

CHAIR—We hope the paper will be out early next year. We will make sure you get a copy of it and the recommendations.

Mr Charlton—Thank you for your support.

[6.01 p.m.]

CRAWLEY, Mr Hugh, Past President Canberra Division, Past Chair Environmental Engineering Society, Engineers Australia

PALMER, Mr Malcolm, Research Officer, Public Policy Unit, Engineers Australia

CHAIR—I call the representatives of Engineers Australia. Although the committee does not require you to give evidence under oath, I should advise you both that these hearings are a formal proceedings of parliament and consequently they warrant the same respect as the proceedings of the House itself. I would like to remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. I would like to ask you to make an opening statement and then we will go into questions. Thank you.

Mr Palmer—The rural sector accounts for 79 per cent of Australia's water usage and it is currently facing a number of problems with water management, including drought, overstressed rivers, salinity and deteriorating infrastructure. Engineers Australia believes that significant changes need to occur to ensure sustainable water quality in the future. Engineers Australia has over 70,000 members, some of whom work in the rural water industry in areas including infrastructure development, water catchment management, environment protection and research and development. We have further contributed to water management through the *Australian rainfall and run-off* report and the National Salinity Prize that encourages innovation in solutions for salinity.

Engineers Australia's submission to this inquiry supports current federal government programs which are attempting to improve rural water management, such as the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. However, we believe that further improvements need to be made in areas such as research and development for water management and sustainable farming methods and the introduction of a national water trading market. Engineers Australia places particular emphasis on the importance of local community involvement in protecting rivers and waterways through catchment management and protection of biodiversity. In summary, Engineers Australia believes that, if rural industries and communities are to prosper, an increased emphasis should be placed on better management of rural water supplies and the role of engineering in helping to solve problems such as salinity and water quality.

CHAIR—Thank you very much. Do you have anything to add to that?

Mr Crawley—No, thank you.

Mr FORREST—It is good to see the engineers come along and help in our debate.

CHAIR—Yes—Mr Forrest is an engineer himself. In your submission you talked about environmental management systems. Could you tell me if the environmental management systems are being adopted by the farming community? How can more farmers be encouraged to adopt EMS?

Mr Palmer—As far as we know EMS are being adopted by some farming communities. I gathered that information from the New South Wales government, but we only have limited information on that at this stage. I would say it has been adopted in some farming communities in New South Wales but I do not know which ones specifically. It is being attempted. It is really an attempt like a triple bottom line reporting scenario that you would adopt for building development.

CHAIR—You touched on that in your report and I wanted more information.

Mr Crawley—Locally and I think around most of New South Wales the EMS are part of the farm management plan. Rather than having one of these and one of these, you have the farm management plan which brings in different principles that are common.

CHAIR—Thank you.

Mr FORREST—The submission was fairly heavily focused on the need for research and so forth. I would like your opinion on just how well placed we are in terms of our understanding of Australia's water resources position, not just given the current crisis we are in but the way the water is used and all that.

Mr Crawley—I think we are like all the other disciplines: there is a long way to go. There is a fair understanding of the historical record. We mention the Australian rainfall and run-off and the fact that that is the tool many people use to design water systems. But there are new values coming: the environmental values, the values for improving the operation. We do make an example of one of the measures whereby instead of losing a lot of the water that is collected and distributed through the distribution system in an area, there has been pipework—rather than open drains—and so people are able to manage the water we have in a much better way. I think that goes right across the irrigation system, rather than just the one site that we have cited.

Mr Palmer—What Hugh is referring to is the Wimmera-Mallee pipeline project and figures we gained from the 2001 infrastructure report card. Because of the use of pipes, rather than open water channels, we were able to reduce the water usage from 50,000 megalitres per year to 5,000 megalitres.

Mr FORREST—It has taken us nearly 80 years to get it even started. We do not have that time left in terms of other schemes.

Mr Crawley—It was not just the Institution of Engineers but a consortium that did the infrastructure report card; irrigation rated to D-minus and these sort of things where irrigation was built in the twenties to the sixties as part of—

Mr FORREST—Would you make a copy of that available to the committee? That was a good report.

Mr Crawley—The fact is that the irrigation is old, it is tired and obviously in need of redoing. There are plenty of opportunities to come out of that to improve our use of water.

Mr FORREST—I remember from your submission you talk a lot about water trading. I think I picked up some anxiety and concern about the direction that is taking—the lack of good planning. Is that still a concern? We have had your submission for nearly 12 months now. I do not want to lead you, but is your position still as you described to us 12 months ago?

Mr Palmer—We broadly support a national water trading plan that is being put forward at the moment. Our only concern is, as we expressed for example with irrigation, in terms of the infrastructure and also the impact on local communities. There has been some debate around what the impact would be of, for example, a permanent water trade—that is, selling the rights to the water in a particular district and what impact that would have on the local community.

As far as we know, most of the water trading that currently occurs is in temporary trades; it is not in permanent water trading. We do support it, but I guess we support it if there is adequate monitoring and that the system is implemented with the full consultation of the local communities and that they are fully aware. I think, again, for example, of the energy market, where they are attempting to introduce full competition. There are problems there with different regulations in different districts and different states, for example. In this case we do broadly support it, but it has to be shown that it is going to work in practice.

Mr FORREST—Would you suggest more rigour, more interstate uniformity with maybe a rules based approach? What are you suggesting to overcome your anxieties? That was not in your submission. I think you expressed anxiety but did not suggest constructive ways to overcome them.

Mr Crawley—I think we see in the media a fair bit of this anxiety coming through. One of the concerns is that people do not understand the implications of trading. There is a drought on and people sell their rights and there seems to be an assumption that once the drought is over they will get those rights back again, but it is on the market now and so I think there is anxiety about how that will work. The other thing that is of concern is that environmental factors are now becoming more prominent in the discussion and it is a matter of the community determining what the objectives should be; using a bit of jargon, 'conflicting demands for limited resources' and making decisions about those. There is a fair way to go before all of this is running smoothly.

Mr WINDSOR—The Institution of Engineers is a well-regarded body. Do you feel as though in probably one of the most significant issues that we are trying to deal with—that of water—you have been included in the debate sufficiently? I do not mean this debate; I mean the general debate about what is happening with water and could happen—and not only water, but salinity problems and how engineering can be used in certain circumstances to overcome some of the leakages in systems? It just seems to me—I do not like saying this and it is not meant offensively—as though you have been very much on the sidelines. How do you regard yourselves in terms of your position on the field?

Mr Palmer—I could answer that by saying, for example, that the Wentworth Group of scientists receives a lot of media coverage and I could take the liberty here of saying it should be the Wentworth Group of scientists and engineers, which would be correct. But we do feel that we are engaged to a certain degree. For example, we offered a salinity prize last year and the Prime Minister awarded that. We have received some recognition. Also our report *Water and the*

Australian economy, which was published in 1999, with the Australian Academy of Technological Sciences and Engineering, received good coverage particularly among water specialists. We have received some coverage, but we do not have the same public recognition that scientists involved with this issue and other stakeholders have received. When you look at it, a lot of our members do work in key areas involved in water management, such as irrigation, also things to do with environmental flows—a whole range of areas.

Mr Crawley—I think that is right. A lot of the reports that are done for the Murray-Darling Basin Commission are done—I was going to say 'by'—with the input of engineers, so at an individual level, yes, there is a lot of involvement. Malcolm said at the institution level we have a fair presence and we are trying to keep that level up by offering awards. There was an award last year, a national award for excellence. It was a salinity and conception scheme in South Australia. Yes, there is a presence and the institution tries to be part of the debate.

Mr WINDSOR—Personally, I think you could be a very important part of the debate, particularly in relation to engineering solutions to some salinity problems in specific areas. Are members of the institution doing any work on things like the re-engineering of the Menindee Lakes and the savings in evaporated water that could occur and those sort of physical structure changes that could generate some savings in water—with deeper dams? They are doing a bit in Queensland, for instance, with bank structures. Are you actively participating in that side of the debate?

Mr Palmer—I do not know. Because we have a large membership we do not know exactly what our members participate in. For example, with regard to the previous speaker from Snowy Hydro, we know some of our members were involved in cloud seeding—I think to do with Tasmania hydro—and they may have even made a submission to this inquiry, I believe, but we do not know. We know we have a lot of members who work with infrastructure projects and water management issues, but we do not always know exactly where they work. Yes, they do certainly come across a lot of environmental problems. Our National Committee for Water Engineering would be the one to ask about that, because they would know exactly.

Mr FORREST—For Mr Windsor's information, the IE is funded by the generosity of its members, so it does not have a general allocation for research. Most of that is probably done by membership, by the members themselves.

CHAIR—How do you touch base with the 70,000 members to get an informed opinion?

Mr Palmer—That is a good question. What we do, for example when we are preparing submissions such as this, is we first advertise the submission in our magazine and on the Internet through *e-News*. We also contact various committees. I mentioned the National Committee for Water Engineering. There are other committees, like our Environment Society Committee. We talk to our members, we email them and we phone them up and find out what their interests are. We try to gain membership interest in a particular issue.

We do the same with our policies. We have a full set of policies on our web site and we put them out for member comment. We get feedback from the membership—sometimes good, sometimes bad, depending upon the topic. Then, for example, the policies are ratified by our council, which is a body with members elected by the institution membership. The council

decides if they like the policy, if they want to modify it and so forth. It is a democratic organisation and you do have different views, but we always try to come to a conclusion about what those views are and to summarise those views. For example, I could say in terms of this submission that we would have broad support in the membership, because they recognise that water is such a key issue.

CHAIR—Thank you. Do you think research into water issues in Australia is well coordinated and managed? Where do you see research heading in the next 10 years?

Mr Palmer—Research appears to be well coordinated at the moment. There are a number or organisations, which we mentioned in the submission—such as the RIRDC—and a number of state governments are doing research.

Mr Crawley—And the CRCs.

CHAIR—Do you find it easy to access this data? We have had submissions made here and have taken evidence that it is really hard to get your hands on data; there is no coordination of all this data which has been taken. Do you find you have difficulties in that area?

Mr Crawley—I have a particular relationship with the CRC for Freshwater Ecology and I find it very easy, probably because I am interested in the urban water management and that is where they are working. I find it quite easy. It is just a matter of knowing the right question to ask and then following up to find the right person. Since the CRCs and those sorts of bodies have been instituted, the coordination of research is much better than it was in the past.

CHAIR—Sorry, I butted in then when you were answering the question about how you see research or where it is heading in the next 10 years.

Mr Palmer—Probably the best way to answer this is to quote the Wentworth Group's *Blueprint for a living* continen. In another submission we made to a Senate inquiry, a similar inquiry in this area, we supported some of their statements—for example, new farming systems using different crops or different planting methods is one option; using crops that use less water; rotation and combination crops; things like that and also research into water management, into water quality. Our organisation thinks it is going to be quite extensive in the future, in terms of the research. That is just one example.

Another example is irrigation technology which was mentioned earlier. At this stage of irrigation infrastructure in Australia there are problems, so that will probably be an area we think will be explored in the future in terms of research and development.

CHAIR—Thank you. Your submission was very detailed and we really appreciate the time and effort you put into it. Thank you both very much for coming here today and adding to the submission you sent. Our report should be finalised early next year. We will make sure you get a copy of that with its recommendations. Thank you for your time today.

Mr Palmer—Thank you for hearing us.

Resolved (on motion by Mrs Ley):

That this committee authorises publication of the proof transcript of the evidence given before it at public hearing this day.

Committee adjourned at 6.22 p.m.