Australian Government
Productivity Commission

PRODUCTIVITY COMMISSION

INQUIRY INTO BARRIERS TO EFFECTIVE CLIMATE CHANGE ADAPTATION

DR W. CRAIK, Presiding Commissioner
MR J. COPPEL, Commissioner
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TRANSCRIPT OF PROCEEDINGS

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Continued from 18/7/12 in Canberra

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DR CRAIK: Good morning to the crowd of two and welcome to the public hearings for the Productivity Commission Inquiry into Barriers to Effective Climate Change Adaptation. My name is Wendy Craik and I'm the presiding commissioner in this inquiry and with me are Jonathan Coppel and Neil Byron.

The Productivity Commission received terms of reference for the inquiry on 20 September 2011. The inquiry terms of reference gave us two key tasks: the first was to assess regulatory and policy barriers to effective adaptation, and the second was to identify high-priority reforms to address barriers. We've held consultations with governments, businesses and other organisations and received 79 submissions prior to releasing a draft report on 27 April. Since the draft report we've received another 82 submissions and they still seem to be coming in.

We're grateful to the many organisations and individuals who have already participated in the inquiry. This is the final day of public hearings for this inquiry. We have had hearings in Sydney, Melbourne, Canberra and today in Adelaide. Interested parties from other states have been able to participate by teleconference. Following these hearing we will be working towards providing a final report to the government in September. We like to conduct all hearings in a reasonably informal manner but I remind participants that a full transcript is being taken. For this reason, comments from the floor cannot be taken, but at the end of today's proceedings I'll provide an opportunity for anyone who wishes to do so to make a brief presentation.

Participants are not required to take an oath but are required under the Productivity Commission Act to be truthful in their remarks. Participants are welcome to comment on the issues raised in other submissions. The transcript will be made available to participants and will be available from the commission's web site following the hearings. Copies may also be purchased using an order form available from staff here today.

To comply with the requirements of the Commonwealth Occupational Health and Safety legislation, you're advised that in the unlikely event of an emergency requiring the evacuation of this building, you should go outside, down the stairs just out there and out the front and the assembly area is the corner of North Terrace and Victoria Street. Can I also ask the audience to please turn off any mobile phones or turn them to silent. If there is any media here could they please contact the staff.

I would now like to Welcome the South Australian Local Government Association who don't seem to be here. We might start with you, Rohan. If you could state your name and your position for the record and then if you would like to make a brief opening statement, we would be happy to hear from you.

MR HAMDEN (DEWNR): I'm Rohan Hamden, I'm the director of Sustainability Industry Partnerships with the Department for Environment, Water and Natural Resources. I am here talking on behalf of the South Australian government submission to the Productivity Commission inquiry into barriers to adaptation. I am happy to skip through the front half, that was just the stock standard statement about what South Australia is doing. But basically we recognise that adaptation is a local response requiring decision-makers and in South Australia it's about ensuring decision-making at the right scale, so defining the problem at the scale at which it is a problem and working at that scale to address the solution. In a South Australian context that's mostly local government, regional NRM boards and, to a lesser extent, Regional Development Australia as a coordinating body as a coordinating body and working with those partners at an appropriate scale, a geographically relevant scale to work through the issues to help come to terms with the impacts of climate change and help them plan for the impacts.

So I will ask you to skip through to the colourful map that looks like South Australia with lots of nice lines. What we do in South Australia is try to make sure that we have a region that is climatically relevant with one set of climate indicators across the scale but not so large that the span of control gets difficult. So we work within the scale of what we call our state government planning boundaries and we road test these with regional communities, they were quite happy to pursue this approach and that sets this whole span of control issue, ability to influence outcomes but make decisions at the local scale.

I will ask you to skip about halfway through to a slide that says Role for State Government. It's towards the end and it's before the graphs from the CSIRO report. One of the points I wanted to highlight that was different to what we're getting from the Commonwealth and maybe through your report is a particular role that we see the South Australian government fulfilling and it may be a cultural context with the strength of our local institutions. We have an outstanding local government association, Regional Development Australia is quite well organised. I haven't seen that in other jurisdictions. We have had this conversation in other jurisdictions and they are a bit jealous of the strength of our local institutions in terms of pulling this stuff together and their ability to cooperate across sectors and we have statutory NRM boards which is unusual apparently.

One of the roles that we see is that we're trying to look at how we hit the problem at the scale of the market failure. It's about bringing regional leaders together to talk about the triple bottom line issues around climate change adaptation. So it's a shared problem with a shared responsibility and we're asking regional leaders to thing about other sectors needs when they're trying to plan for the impacts of climate change and the best partner to help facilitate that is state government. So in South Australia state government sees itself as having a role of facilitating partnerships and a bit of lubricant that brings this whole process together. I think it is

a genuinely defensible public good that we bring that otherwise, from my experience so far, wouldn't have happened, at least at the pace that it's happening at the moment.

Part of the South Australian government submission where it says Consideration of Psychological Response, which is the next page, I was troubled with the language in the original draft of the Productivity Commission report and I will go into some detail why. It comes from my personal perspective about working, trying to actually drive adaptation planning reform through communities in South Australia. The next few graphs are taken from Leviston and Walker - the CSIRO report on community attitudes published last year - and basically the key findings are that they community is evenly split on whether climate change is caused by human activity or not which actually then determines people's willingness to act to a greater or lesser extent and they did demonstrate there was a statistically relevant demonstrate that support for policy responses is actually strongly influenced by wording.

If we flip over to the mean surface chart of the Australian global service temperature anomaly, if we look back from about 1940 to 1980 meteorologists are split - well, there is research to be about what are all the driving forces that led to that degree of climate variability. Greenhouses gases was a factor but other factors were possibly more dominant. But as we head into the 21st century it's clearly greenhouse gases that are the dominant force for global warming and that's completely well understood. But if we flip over to the next pie chart, it's not understood by the community. The green indicates that 42.8 per cent of the community think that climate change is happening and it's anthropogenic and 45 per cent think it's natural. I put to you that's a problem.

If you flip over to the next page, I've taken the chart that talks about how you feel climate change will hurt you personally. There's a distinction between the grey and the green lines. If you think it's natural, you think it's going to flip back, there is going to be some magic switch in the climate that means that eventually we will head back into Holocene climate again rather than be on this warming trajectory. I think that is played out by these next two graphs. If you feel that it is natural, you're hedging your bets saying, "It's probably not actually going to affect me very much. It's not going to be that huge and it's not going to have a big effect on my lifestyle," which is the grey bars all tending towards the left. But if you feel that it is human induced, you get a greater sense that perhaps it is going to affect you and it's something we need to deal with.

Then this flips over to the next chart which is an assessment of policy responses and the question was asked, "Is the federal government doing enough or not enough?" The response to that question was also influenced by the perception about whether it was natural or human-induced climate change. So basically it was saying if you believe it's human induced you are far more likely to believe action is

required to deal with it. This chart pulls out that learning. The perception is government is doing too much, not doing enough. But it does show a weighting towards those who believe that climate change is human induced, that we think that something should be done. There is a slide that you don't have because it named names. Only last week I was with a major industry body and we were talking about sea-level rise and he said, "At the end of the day most of my members this climate change stuff is crap," and that's what I have to deal with in certain context. So it is still a public perception and a leadership perception in some sectors that we need to deal with. I see that as a barrier.

So I found the language in the report a little bit too hedgy in terms of stating the actual nature and the real threat we face with climate change and therefore we put quite a lot of effort into the submission around providing evidence that it is not about looking at the past climate change per se, it's looking at the past climate change recognising that climate is actually on quite a severe warming trajectory. So if you're going to talk about the future of planning for climate change, it should be done in the context of quite a severe warming trajectory and that should be clear in the language. Hence they were the papers we pulled out to highlight that is; obviously we can quote evidence right now that we are clearly on a warming trajectory and it is affecting how we live now.

Then I constructed this use of language slide to be far more tricky and to con you into something, so I apologise for the fact that you actually get to read everything it says without me doing the language around it. What I have found with working with the community is language is extremely important and to talk about positives and then hedging or positives and then uncertainty. But I found the language used in the Productivity Commission report talked about uncertainty at the start of the sentence essentially and I use this an example - I am being oversimplistic for the sake of illustration. So the first sentence in the body of the document says, "The weight of scientific evidence suggests that Australia's climate is changing and will continue to change in the future, notwithstanding current climate mitigation action." That automatically says the weight of scientific evidence, if I'm sceptical about climate change, that puts a 49:51 assessment in my mind and I'm talking from my own experience working with people.

So automatically I'm hedging my bets around, "Am I going to say is it human induced or not?" The second statement is how I think that sort of statement should be made, "Australia's climate is changing and the vast majority of evidence shows that it will continue to change into the future." It is a far more positive assessment of what is actually happening. It is the same message but it is said in a way that there is less wriggle room and there is less psychological space to deny it. My third one is saying - and I know you haven't done any attribution but if you wanted to go the whole hog, I would appreciate if you had said, "Australia's climate is changing as a result of human activity and the vast majority of evidence shows this will go into the

future."

The last one is the quote from the Economist. The Economist magazine - I have obviously read it for many years - went from vaguely climate sceptical to vaguely human attribution. But at least now they're going to statements like, "A two-degree increase in global temperatures which appears inevitable as greenhouse gas emissions soar." So they are being very positive in their attribution and their assignment of language.

So I put to you that your report is extraordinarily important in this season of the debate around climate adaptation and therefore your language is equally important. I think it will be a reference document, at least for the next two or three years, about how people will - you are seen as an extremely trusted body who words should be heard and therefore I would ask you to consider what I have said about language and how to positively affirm what is definitely known; not changing the core message but thinking about how that language actually affects people's perception and response to that.

Finally, just to reinforce what the state government put up around taxation issues, we agree actually that taxation reform would be ideal, particularly around land tax measures and insurance levies. However, any taxation reform has to be done in the context of a couple of core principles, obviously revenue neutrality; community preference is a huge deal because we are a democracy and it's the ability of the community to come to terms with the change; equity considerations around how it's spread and the transitional issues about the person who purchased the house just before the tax came in paid massive stamp duty and then there is land tax every other year after that. So the state government does recognise the need for reform, however, it's not something it go at alone, it has to be a national level reform. So we would ask that you consider talking about encouraging national level action in this space. It's too big a deal. Especially around the community preference issue it's not something a state can go alone on, it has to be led at the national scale and states participating in it.

There is some work through CAPP between South Australia and, I believe, the New South Wales government looking at some early tax reform issues as a bilateral discussion at the moment. So we are committed, it's just about finding the right pathway. That is all I have to say.

DR CRAIK: Thanks very much, Rohan. I think the ACT - - -

MR HAMDEN (DEWNR): Yes, they have and they're talking about. Are they going to do it?

DR CRAIK: I think they are going to do it. I think they have decided to actually

do it.

DR BYRON: But over a long term.

DR CRAIK: Yes, phase down and I suppose that makes sense. Thank you very much for your submission and thank you for the slide show and your comments and also your comments on the language in the report, that is really helpful to us and the detail in your submission. Neil is going to start with a question and then I will carry on after that.

DR BYRON: It is just some elaboration on what you actually have in the PowerPoint. I was struck in the submission about the way South Australia, I think, unlike any of the other states, has thought through carefully the relationship between what the Commonwealth is doing and what the state can and should be doing and then local government where we all agree the rubber hits the road and in other states we found a lot of confusion about the tier between local government and state, whether it's regional NRM bodies, regional organisations of councils, the regional development authorities and so on and you seem to have all that together.

MR HAMDEN (DEWNR): Yes.

DR BYRON: I would just like to know more about how that works because we don't seem to have anything like that in the other states.

MR HAMDEN (DEWNR): I did have a conversation a couple of weeks ago, after the NCCARF conference, with the other jurisdictions and we actually went through all of this in detail, "Why do we do this in South Australia?" So it was quite illuminating. My perception was South Australia does benefit from quite a good history of establishing these other levels of institutions and supporting them or allowing the grass roots to grow. So Regional Development Australia is quite a strong group comparatively and so they do tend to be very good catalysts at the regional scale and have been given the imprimatur to work across the region and across regional leaders and build those networks and the funding and that doesn't seem to have happened other jurisdictions, so we already have that leverage.

The Local Government Association in South Australia seems particularly strong and particularly cohesive, a particularly useful cohesive force. Again, I think I would have to rely on you to tell me why. It might be do with an act or something or just personalities. But, yes, that was definitely the perception. The other thing is South Australia has a very centralised model of state government service provision whereas other jurisdictions have quite a decentralised model, particularly New South Wales.

This is heading way out on a beam and possible postulation and theorising but I

think if they try and tackle the scale of a problem, they can automatically start to use their regional institutions that is already set out in the community and connected with the community but that is so many people they are already overwhelmed. So if you start to try and unpack a region, you automatically start inviting 20 or 30 people from state governments to the table before you have even invited any local leaders, whereas we don't necessarily have to do that here, we are relying on these local institutions to provide the coordination and we always have done. Not that there are any awards being handed out as a result of this presentation, but we have some outstanding people in this sector in South Australia and a culture that promotes that.

DR BYRON: A related question just of clarification and definitions. The word "community" I think quite rightly figures very prominently throughout the submission. That word is often used as people who live in the same space or people who have a community of interest no matter where they live, there are communities of interest and so on. So is there a particular definition of "community" that I should take when reading this.

MR HAMDEN (DEWNR): The definition is the person with authority and control over the issue. We work with local government because they are actual in control of probably 70 or 80 per cent of the issues at a regional scale. They have social welfare programs, a degree of economic development, do a lot of work around the region and a lot of connections.

DR BYRON: Manage a lot of assets and services.

MR HAMDEN (DEWNR): Manage a lot of assets but also they're extremely well connected. So although they don't have direct authority, they have a lot of agency, they can influence a lot of outcomes. So NRM boards to a lesser degree and RDA to a smaller degree again. So when we talk about community, it's about identifying and working with the body with control, agency over the issue. So our state government's community of practice is the regional leadership bodies but we were working through processes to help those regional leadership bodies work with their constituent groups to help them.

DR CRAIK: Do you think the fact that the NRM boards are statutory is a plus?

MR HAMDEN (DEWNR): It's a huge plus. They have clear guidelines about how to behave, what to write, how to access funding. What was telling was some recent Commonwealth funding bids where we were struck by how this NRM reform program they were putting suddenly transitioned this community engagement process and I thought, "This is weird when we have already got that set up," but it was to deal with other states who terribly underfunded NRM boards and aren't very well connected and they're all volunteer groups. So, yes, I think we have benefited significantly from that approach.

DR CRAIK: One of the comments you make in your submission is you express reservations about the usefulness of downscaled climate projections. Is it then worthwhile to do them and if not, what does it need?

MR HAMDEN (DEWNR): It needs to be specific. We're spending quite a lot of effort on getting water resource modelling downscaling data but that is how water resource management is done. So, yes, absolutely but it by no means a solution to every problem and for the investment you put into it, are you getting a better outcome? So should we do a massive downscaling operation of rainfall projections for the sake of crop production in the Mount Lofty Ranges or out into the mid-north or should we just take today's rainfall and discount it by 10 per cent which is what we would get from a global model and would the outcome be radically different for all that additional investment? I put to you probably not and so it really does have to be context specific and it's certainly not. So it's in the context it's not a bandaid fix-all but I suppose historically it is how it has been promoted but the debate is starting to get more sophisticated now.

DR CRAIK: In relation to one of our recommendations there was a comment in the submission that in relation to sea flooding, "It's not just a matter of coordination, it's a matter of understanding the nature and scale of risks by providing access to high resolution data."

MR HAMDEN (DEWNR): Yes.

DR CRAIK: So in that case high resolution data is important. Who should be responsible, do you think, for providing that data.

MR HAMDEN (DEWNR): We would always argue it is a public good, so we would like it as a collaboration between the state and the Commonwealth because I think it is a general public good, everyone would benefit from this data. But we are looking through policy reform so you don't need to have one metre or 10-centimetre resolution across the coast, it's region specific.

DR CRAIK: Horses for courses.

MR HAMDEN (DEWNR): Yes, absolutely. So it is doing that broad policy work generally around where we need the detail and where we need less detail and then doing the national program around it because it would be good to have that comparability as well.

DR CRAIK: You have all these documents that the South Australian has done, strategic planning documents and quite a structure for dealing with climate change adaptation. Are there any barriers to any of the implementation of that? It all sounds

like it's going reasonably well.

MR HAMDEN (DEWNR): It is going okay and I notice it's an autonomous engagement but we are the face of autonomous change. It's individuals and groups working to try and tackle this problem. But it I do put to you that whole community perception issue is a big deal. So if 50 per cent of your community thinks it's natural and it could roughly flip back or could do whatever - we don't know what it's going to do - they do tend to under-invest. But that's not what is happening. We are in a warming cycle and it's going to be warm and hot significantly for many years to come and we should be investing.

So even the discussion around real options is hedged by the fact that we can understand in this space because we don't really know what's going to happen with the climate. We do know some things quite well and that should actually fit your plan. So the core of what I have discussed today is that the perception is a real issue.

DR CRAIK: Do you think if it's framed in terms of a risk management issue rather than a climate change issue, does that change?

MR HAMDEN (DEWNR): It doesn't. We do it as a risk management issue but I suppose the point I'm trying to highlight is you don't even assess the risk properly if you think it's a natural cycle because if it's natural it will go back one day.

MR COPPEL: Just on that, already making a distinction between natural and man-made has a certain level of sophistication. We have also heard there is simply form of cognitive barrier that recognises there may be climate change but doesn't see that as being a particular issue or excludes that from their way of thinking about the future. Did you have any reactions to that? Is it really just a dichotomy between natural and not natural or is it something that's even more profound than that?

MR HAMDEN (DEWNR): It's absolutely profound. It's based on our human psychology and our ability to cope with that - whether we influence the world. I've no doubt you're familiar with all the literature around how people perceive change and the nature and scale of this change we're asking. But I think the classic quote I have read is it isn't about climate change it's about the age-old debate of people's relationship with the world, control over their own lives, our ability to harness natural environment, whether there should be government or shouldn't be. It's bringing out all of those factors as well because it's something we don't control, it's something that will affect us and broadly. I think it is a pure psychological response. I see it changing over time. People will come to terms with it as we help to deconstruct what it means. But right here, right now it is a problem as humanity makes its transition into understanding what this means.

DR CRAIK: One of the things you talk about in the submission is the planning

tools that you do have here in South Australia and you talk about indemnities and you talk about temporary constructions they have can have time-limited permits and trade hall development rights and you have those in Yorke Peninsula and overlays. Are those things used?

MR HAMDEN (DEWNR): To a limited extent.

DR CRAIK: Is there much reaction when they are used? Are people surprised or unhappy?

MR HAMDEN (DEWNR): I would say it follows the standard policy change curve which is those who are already in the space and are disadvantaged, massive reaction. So you get your full spectrum. I wouldn't say it's necessarily different to a relatively major policy reform. But they are new and they are having to be authorised at a local scale on a council by council basis. So there are big barriers, there are cognitive barriers and business barriers there where you've got to work through.

DR CRAIK: So you have to get the policy through the council first.

MR HAMDEN (DEWNR): Yes. I'm assuming that. Would that be a fair - you can rebut me if you want.

DR CRAIK: As far as I'm aware you're the only state pretty much that actually has these things quite explicitly.

MR HAMDEN (DEWNR): Okay. I could take that one on notice, if you like.

DR CRAIK: Overlays are in other states but I'm not sure about the indemnities so much and trade hall development rights. In relation to agriculture one of the comments the submission makes is despite productivity increasing for the last five decades it has slowed recently et cetera et cetera but there is an expectation that agricultural industries well placed to systematically to respond to future threats of climate change. So can we interpret that as meaning that the South Australia government doesn't really consider there are significant barriers to adaptation in the agriculture sector?

MR HAMDEN (DEWNR): Significant barriers? Can I hedge my bets on that one. I might actually defer that one to Peter Hayman.

MR COPPEL: I just want to follow up on an earlier point that you made about downscaling of information where you said it was important to have information that was context specific in terms of whether downscaling is useful or not. Do you have any idea of which areas or what sort of downscaled information is useful and those

that are less useful?

MR HAMDEN (DEWNR): The commitment of the South Australian government is around the water resources theme. It has picked a particular path and a particular methodology because it needs daily rainfall data for us to model water resources. But that doesn't solve the future for us, it just helps us to find the complexity of the policy problem we're going to have to deal with with reducing water resources. It helps to put dimensions around the nature and scale and the timing of when we're likely to have to significantly respond to this reduction. So when you have a clear understanding of a decision pathway and the decision-makers and where they make decisions along that pathway, then you can start to deconstruct, "Does downscaling information really assist me in that process?" In the case of water resources the answer is yes.

But if you're looking at saying, "For an agricultural production for a region, do I really need to start projecting daily rainfall data for the next 30 years or will I just have an equally sophisticated decision or a reasonable assessment of the risk and nature and scale of the problem by applying a generic 5, 10, 15 per cent sensitivity analysis as from the global climate models?" I think one of the messages we have always tried to reinforce is don't start with a solution to the problem which is downscaling, start with understanding the nature of the decision that's been made and who needs to make that decision and what information they need to help them assist in that decision. So it's that really good user-needs analysis first that helps to pull it together.

One of the things I have noticed being involved in these processes is that until you actually deconstruct this with the decision-maker, they didn't know that's how they made the decision; you know, it's some black box in their head they have never worked with. So they can be quite difficult processes but the outcome is worth it and better investment in the long run.

DR CRAIK: Okay. I suppose Peter will be able to talk more about that too when he gets here, given his focus. Thanks very much, Rohan. Thank you for your submission, the input, coming along today and your slide show.

DR CRAIK: We now have the Local Government Association of South Australia. If you could state your names and positions for the record and if you want to make a brief opening statement, we would be happy to hear from you.

MS CAMPANA (SALGA): Thank you very much for having us come and talk to our submission with you. Our Wendy Campana, the CEO of the Local Government Association, and I will let Adam introduce himself.

MR GRAY (SALGA): Adam Gray, director of environment at the Local Government Association.

DR CRAIK: Thank you. If you would like to make a brief opening statement.

MS CAMPANA (SALGA): Yes, we would like to and, I suppose, perhaps build on the comments that you were talking with Rohan about beforehand in terms of the way in which state and local government work together and how our sectors may be able to achieve some of the things that you may not be experiencing interstate. Just by way of background, the Local Government Association has been the voice for local government for many, many years and we have had full membership of the LGA for well over 30 years, so we have a long history of cooperation between ourselves and councils.

I suspect though that in the last eight to 10 years we have taken a slightly different approach to the way in which the LGA has worked with members and that has largely been driven by some of the particular challenges that we have had as a sector in terms of - I suppose more recently in 2005 we experienced our property values all over the place and across the board that had implications for how councils were rating. We had quite a bit of media reaction to that, community reaction to that and so the LGA in South Australia did something that no other state has ever done and it basically established an independent panel of three people to take a look at our sector from a financial and asset management point of view to see how we actually make decisions and give us some advice about how we can better establish our rates based on our financial sustainability and asset management activities and any other related activities that it found.

That gave us an opportunity for six months to have really good look at ourselves and to have this independent body do that and come back to provide 63 recommendations to our state LGA about how we dealt with them. Some of those recommendations were changed to the Local Government Act. Some of them were about education and training of our elected members and staff and some of them were about policy development. So we ended up implementing that in the latter part of 2005 and within two years we had turned the situation of a negative aggregate position of local government financially to a positive position in two years.

So we kind of set our sector on a train which was about LGA identifying a difficulty with you, undertaking some intensive research, identifying strategies to manage it and then working with the sector to do that, and the state government. We've been on that kind of a path with local government ever since and in terms of climate change, we've actually specifically used our mutual liability scheme a couple of years ago to fund adaptation plans for every council in the state. It gave us an opportunity to have our mutual liability scheme, work with every council, help them understand what climate change was all about, provide them with data around the particular areas that we seem to experience difficulties with in South Australian and particularly local government, being flash flooding, temperature rise, sea-level rise.

What does that mean for the business of local government? It was very much about risk management in a lot of ways but it provided an educated path for them to go down, for elected members and staff. We worked obviously very closely - the mutual liability scheme started out as an insurance organisation for local government in South Australia. It's actually a national scheme now. Local government in South Australia tends to say, "There's a problem. Let's define whose responsibilities it is, and when it's our backyard, we'll fix that up, and we'll take your advice to state government about how we do that. We'll even come to you with legislative change that we think we need to have to help us do that, but we'll look after that patch. But when it's a joint responsibility, we demand and respect the difference in the roles and responsibilities but we do demand to have an actual relationship about how we go further." Sometimes that works really well, sometimes it doesn't work so well, and we do have times that we disagree, that's obvious, but I think we do have a system and an approach in South Australia in local government which isn't reflective of the other states and allows us to be perhaps a little bit more cooperative and maybe even ahead of the game.

I, every year, go to London to do the renegotiations of our insurance arrangements and one of the things that I find fascinating when I go there is often South Australia is recognised as doing stuff that internationally local government is not doing. It's been fascinating to hear their reaction to our climate change program that we're doing and the report that our mutual liability scheme in particular prepared, using that and talking about activities internationally that are not having local government deal with climate change the way we are in South Australia, so it's quite rewarding to hear that.

It also means that we get involved with some of the insurance statistical data when the other states - and I can recall quite clearly in the bushfire area where we had our major bushfire - there were some terrible bushfires as you know in Canberra and Victoria. That had an impact potentially on our reinsurance program, so we were able to sit and talk to them about the different responsibilities we have in South Australian local government compared to the other states, how our emergency management arrangements work and some of the climate change issues that we're

facing as temperature rises, how we're dealing with that in terms of being familiar with the issues, not always being able to control them but being familiar with what the issues might be.

There's a whole range of things that I think might perhaps be unique to South Australia. I just wanted to set that scene and then I wanted to give Adam, if we could, an opportunity to summarise some of the key projects that we've been undertaking and some of the key areas where our focus has been.

MR GRAY (SALGA): Thanks, Wendy. A lot of this was highlighted in the background material that we provided in our submission but I just wanted to give you a brief run-through on some of the key activities and probably some of the thinking around why we've pursued some of the programs that we've achieved some success in. Wendy has already outlined the mutual liability scheme's climate adaptation program and that's actually been undertaken with around 65 of our 68 councils. There are a couple of councils that undertook the Commonwealth's local adaptation planning and program, so we didn't need to repeat that with those councils. We've pretty much had every council in South Australia participate in that.

The first few sessions of that program, it's fair to say the mutual liability scheme and the delivery agents actually went through a learning process. It was really the first time that we had engaged in a sector-like approach in introducing councils across their whole business units, so not just their sustainability officers or the CEO, but through some of their economic advisers, their planning team and environmental health officers in discussing where is our climate going and what are the key impacts that we're likely to experience as a sector. That was a really interesting process and some of the learnings that came out of that was they spent a fair bit of time early on going through the signs and they gradually shifted away from that because the approach that they were really running through was a risk assessment approach and whilst the science was interesting and it set the context, what was distracting was a lot of debate around the science and details of the science.

The program evolved and it did end up very much a risk assessment approach: purely for effective local government business, what does it mean for our business? That improved the buy-in, so we weren't seeing officers head out at lunch and then not coming back to the session in the afternoon; we were actually starting to see a program that saw engagement from go to whoa because it was a two to three-day process over a couple of weeks. That risk assessment approach really did attract the interest because then it started influencing councils' risk registers and the way in which they managed their risk profile.

The mutual liability scheme project identified through their interim report, which is available on our web site, a number of key areas for our business and that directed the LGA in undertaking - which I've outlined in our submission - the

national climate change adaptation research project on the impacts of climate change on our assets and infrastructure. That's really a program that's designed to assist councils in understanding the impacts of climate change on hard assets and then understanding the economic impact so that we can influence our financial management and our asset management plans. Councils undertake 10-year asset management planning processes, so they're long-lived documents. There is a level of uncertainty that sits with a management plan that sits out for that long distance, so we invested in a program in our system to try and understand some of the climate impacts.

Obviously 10-year climate impacts are quite incremental and so the project actually looked to projecting out to 80 years, so councils have that capacity to not only look at their 10-year asset management plan but have a think about the next period of 2030, 2050, 2070, 2100-type time periods.

Another area that we also identified through that process was some of the decision-making around our coastal assets and our communities. The Department of Climate Change and Energy Efficiency had around $4.2 million a couple of years ago to invest in coastal adaptation decision pathways. In undertaking that project, it was really evident that there were a number of key challenges to local government and it was easy for some of our officers to work through some of the elements of that but when they try to assess all of the impacts and all of the associated influencing factors, it was a very complicated space in which to make decisions. So we're finalising this project at the moment. We will be able to provide to local government - it looks like a decision tree and alongside of that decision tree some financial options analysis as well, to assist them at least get a sense of what the financial impacts of different decision pathways might be.

One of the interesting outcomes of that project was a low-lying community in our gulf area which was more subject to storm surge through inundation rather than high-impact erosion and they assessed economically the cost and benefit of investing further in a levee bank that's already in place as opposed to different adaptation measures. Whilst we've only really indicated this to the council very lately, is that in a purely financial sense what has been traditionally expenditure on a levee bank to protect, the council would actually be financially better off elevating every house in that community to cope with the next 80 years of sea-level rise. So that probably had never occurred to the council or the community that, whilst we have a levee bank there, the ongoing management regime that would be required to keep this to protect a community that's in a very vulnerable position may not actually make the best financial decision in a long term sense. So that's going to be an interesting project to roll out of the next few years to assist councils with some of those decisions.

I don't know if Rohan touched on this, but we're also looking at another project to actually take a lot of these tools and measures that are available into a digestible

sense because over the last few years we've started to see a bit of a proliferation of tools available to decision-makers. There has been work to try and assess the value of those tools and where they are best applied. However, what we haven't seen is a lot of investment and actually trying to deliver those tools in a meaningful way to the practitioners. So the state and local government sector, through our local government reform project, are investing in a mechanism to assist local governments with not only their asset management and financial management plans to incorporate the impacts of climate change into those but also to assist them in engaging in a community of best practice around climate adaptation.

We have also been working on assisting the regions, and I think Rohan talked about the partnership between local government, RDA and NRM board in regions. So we have been doing a lot of work with the state and with our local government bodies around vulnerability assessment and then adaptation planning so they understand the task at hand and they can work together as a region to try and build planning that is undertaken in a coordinated way throughout the region. We're seeing some pretty good outcomes from that process as well. Again, I think we're leading the nation in that approach. There's piecemeal attempts at this type of work in other states but I think the engagement that we've got with those three sectoral bodies in particular are showing some good advances in that work.

I guess one of the reasons why local government has been an easy sector in which to engage in this is because of the long history that local government has had with climate projects, primarily around mitigation. So the ICLEI cities for climate change project and Local Agenda 21, they've been around for quite some time and that culture of energy efficiency and its influence of our emissions on climate has sat within the local government sector for quite some time. Over the last few years we've started to see a shift of a national approach to emissions through emissions trading and international advances and so there has been less focus on local resolution to that, although that is still very strong and prevalent. But we're now starting to see local governments starting to think a lot more about, "Well, we actually have got a locked-in element of climate change. We need to start making plans for the long-lived impacts of the emissions and the climate change we're going to experience in the future." So there is a gradual shift from local government that has been reasonably easy to transition to the focus from mitigation into some of the more prevalent adaptation changes, but we haven't seen a shift away from a focus on the desire for mitigation to still occur at the local level. The councils are still indicating to us very strongly that that's a key focus for them.

So that's a bit of a potted summary, I guess, of some of the detail of our submission. If it's okay I might move into some of the more key areas from the draft report that were additional to our submission.

DR CRAIK: If you can be reasonably quick because we don't have too much time.

MR GRAY (SALGA): Sure, absolutely.

DR CRAIK: We have got a few questions for you.

MR GRAY (SALGA): Go for it, all right.

DR CRAIK: Even though it's really impressive. Keep going.

MR GRAY (SALGA): I'll run through these really quickly. One of the comments in the report was around past experiences that are showing that we can adapt to gradual climate change. I think my immediate thought to that was we're heading into a period that we haven't experienced in the past and we're also heading into a period of accelerated climate change. So I think while past experiences have shown that there is a degree of capacity, I think we are entering into a period where that is going to be tested and that I think there's going to be new ways of doing things and we're going to have to approach things differently because of the challenges we've got to face. I think that is highlighted from some of our councils that have been effectively holding back the tide on some of those coastal issues.

Protection works are only going to get us so far. The impacts of climate change are going to push the capacity of protection to a point where we're actually starting to see councils thinking about transformational decision-making. So rather than trying to protect and defend, we're thinking about different ways of financing that work, so differential rating. We're also talking about retreat, and so no longer are we going to be able to say to some of our community members that enjoy the views of our esplanades that this land is still going to be here in 50 to 80 years' time. It's not feasible to protect any longer. There's discussion within local government at the moment about that transformational change.

The role of government is an interesting one and, from our experience in the last few years, the strength has been in the collaboration between the federal, state and in particular local government - the three tiers of government. Partnerships are needed through those tiers to tackle some of the changes that we're approaching, and it looks like policy frameworks, it looks like leadership - not only from our bureaucracy but from our political leaders as well. We are starting to lose our community; I think Rohan pointed to that. With the debate that has been going on in the last few years our councils are saying the community is starting to have enough of it and they're losing the impetus that we had maybe five or six years ago, and that makes decision-making a little bit more challenging in the regions.

Councils make decisions that have 50-plus year life. There's a great graph that Mark Stafford-Smith from the CSIRO uses around decision-making over a long period of time and the impact of climate change and I refer the Productivity

Commission to that. I'd be happy to try and dig it up and send it through.

DR BYRON: We've got it.

MR GRAY (SALGA): You've got it. So you're fully aware of that, and I think we're at the spectrum where some of the decision-making and the adaptation to climate change is that long-lived decision-making that sits clearly within local government. So whilst I note the recommendations from the Productivity Commission about some of the easier decisions are those that are here and now and that relate to the climate we're currently experiencing, when we talk about adaptation to climate change we're actually not talking about the climate we're experiencing now, we're talking about the climate that we're seeing approaching us in the 50, 80, 100-year time period because that has got clear implications for our investment now.

So when I read the report I was thinking my definition of adaptation to climate change is not about what we're doing for the climate we're currently experiencing, it's about the long-term projections and making investment now that's prudent for a climate that's approaching us in that time period. I might leave it there, considering the time constraints.

DR CRAIK: Okay. Thanks very much, Adam, thanks very much, Wendy. It's really helpful stuff, also pretty impressive too. The report that you both referred to, I think, from your mutual liability scheme, the report about your climate adaptation project, is that on your web site, did you say?

MR GRAY (SALGA): Yes.

DR CRAIK: Okay. Now, this mutual liability scheme with, you said - you know, you pay tax. Presumably the finance arrangement enables local governments to borrow money from this organisation. Is that what it does and then you pay tax equivalents? How does it work?

MS CAMPANA (SALGA): No, two different organisations. We have got a Local Government Finance Authority which is established under statute. In fact it has been recognised in the recent Ernst and Young report that Minister Crean has commissioned to do with infrastructure management in the future, and that particular piece of research is making all sorts of suggestions about possibly a national fund of that kind. So it operates sort of like a bank really.

DR CRAIK: Yes.

MS CAMPANA (SALGA): But because of the national competition policy it needs to apply a tax equivalent regime. So under the legislation we create a local government research and development fund, and it has to have purposes and

principles set aside and around a million - a bit more, a bit less, depending on the decisions that have been taken and the financing decisions of the authority will mean that there might be more money or less money each year. So that's sitting out there and is available to our sector to do research.

DR CRAIK: No, that's good.

MS CAMPANA (SALGA): So we've used it for all sorts of different reasons.

DR CRAIK: You would be the only state with that?

MS CAMPANA (SALGA): We are the only state with that, yes. Apparently there's a similar model in New Zealand as well, but other states are very interested in that model.

DR CRAIK: So it's a way (1) of borrowing money and (2) a way of getting a fund to do R and D.

MS CAMPANA (SALGA): Yes, a research fund, that's right. Now, with the mutual liability scheme, because of the way that that's established our actuary advice is that we have more funds than we need if something goes wrong and we get a large claim, because we cover some of those claims ourselves, and we also have an indemnity agreement with the state government as well for the really big claims. That has some spare cash that it can reinvest into development programs and that is where we have had the funding, from the mutual liability scheme, for the adaptation program.

DR CRAIK: That's really good, thank you. I think you mentioned in relation to coastal stuff and coastal inundation that councils are starting to think about different ways rather than just defend the possibility of retreat and you mentioned the issue about financing some of these things and you talked about differential rates.

MR GRAY (SALGA): Yes. So during the coastal adaptation project we undertook we had a look at a cliff area within the city of Onkaparinga and they are starting to see a carpark heading towards the ocean. There's large cracks appearing and it's only 15, 20 metres from the kerb on the other side of the road where we start to enter private assets, private property. The questions that the council are starting to - I'm not sure if this is within the elected body, but certainly within the staff they're starting to look at where the cracking is appearing, the costs of trying to hold a cliff from entering from a high-impact erosion part of the coast and then looking at the distance between there and the private asset and starting to really look at that and think, "We're entering into a period where it's financially unviable for us to hold this back. We're not going to be able to do it, it's not within the funds of the council."

There's also questions around equity. How much money do we spend protecting this group of private assets when we have got a community with a whole host of other needs and wants? So there's some real issues for that particular council - and it's not unique, but they are reasonably advanced in climate thinking at Onkaparinga. They are really starting to look at some of those communities. You can see it ticking around but they haven't really got a structure, and hopefully the project that we've done through the Department of Climate Change - and there are 13 or 14 other projects that that fund has invested in and there's some really good value, so we're hoping to get a lot of shared intellect from the 14 projects. So the high-impact councils, those in the upper area that have got inundation as opposed to high impact, are looking at - you know, they're getting flood events, their levee banks are being breached and so, again, they're at a crossroads now starting to think, "What are we going to do with this community?" It's a really challenging time, particularly in the coastal area, for local government.

DR CRAIK: This council you mentioned where they've traditionally had a levee bank and now, with the finance you've been able to give them access to, they've done some assessment of the alternative between raising the level of the community and keeping on rebuilding the levee, is there any information available on that? Is it possible to get us anything on that, because it's really quite a nice little example of how some of the trade-offs go. If you've got the process that they went through with the community to get to that point - because this always seems to be a real issue. The council might think something is a good idea but those who are most affected in the community may have quite a different view.

MR GRAY (SALGA): I think we're in a bit of a caveat, that the minister would like to announce the outcomes of the report.

DR CRAIK: We wouldn't want to jump that, would we?

MR GRAY (SALGA): No, it might cause me some grief so I prefer not to. But as soon as that becomes available we'd be happy to make it - - -

DR CRAIK: Okay. Do you know when that's likely to be?

MR GRAY (SALGA): End of August, early September.

DR CRAIK: It might be running a bit - - -

MR GRAY (SALGA): Then it's subject to the minister's process.

DR CRAIK: Of course, yes. It's running a bit fine-tuned for us, we might just mention what you've said in the transcript.

MR GRAY (SALGA): Clarence City Council in Tasmania, I believe - now, Tasmania has gone through some fantastic community engagement stuff around coastal areas so obviously - Neil is nodding he's aware of that. So, yes, you've talked to Clarence.

DR CRAIK: Yes, we went down there actually and talked to them.

MR GRAY (SALGA): It's held up as one of those exemplary community engagements. Now, I suspect that there's a really willing community that's quite unique in Tasmania than might be in some other areas. So it would be interesting to see whether that process could be replicated in other areas with the same level of success.

DR CRAIK: There was very intense community engagement there, wasn't there.

MR GRAY (SALGA): Very much so.

DR CRAIK: Yes, some of the other places, in New South Wales, seem to run into real problems.

MR GRAY (SALGA): Yes.

DR CRAIK: Yes, okay. Is there any area where the state - Rohan has raised the issue of people's views, the psychological barrier about believing climate change is real and what's going on is related to climate change. Are there any other barriers or is there anything the Commonwealth is not doing or is doing that it's a problem that causes you difficulty - local government difficulties or the state. I mean, well, I guess what I'm trying to find out, are there any barriers that you can see to unrolling - you know, rolling out the sorts of things you're doing, which seem to be working reasonably effectively.

MS CAMPANA (SALGA): Perhaps one of the things that I'm finding difficult in the conversations I have is a little bit about the roles and responsibilities. I mean, our development plan, for example, is a state government document and we simply, as local government, are the regulators of that development plan. There's all sorts of questions around whether the development plans are sufficiently up to date with the potential of climate change and whether in fact local government is exposed from a liability point of view, jointly or severally with the state, in terms of the decisions it might make. So I mean I don't think that we have got to a point in South Australia yet where we're having that intelligent conversation about that area.

Also in our Riverland area there's all sorts of flooding issues that occur from time to time; you have drought one minute, flooding the next. Because there has been a drought the levee banks that existed up there have been adjusted by the

community on their own private properties and, as a result of that, when we have flooding situations we have levee banks that are actually not helping with the flooding situation. So we're having debates about who's responsibility is that, and it's not a cheap task, and nor do we have access and control over those levee banks either as a sector.

DR CRAIK: Who controls the levee banks?

MS CAMPANA (SALGA): Well, our view is the state does, the state has access and ability to go in there. The state's view is that we do. So we're having a bit of a debate about that.

DR CRAIK: One of these.

MS CAMPANA (SALGA): Yes, it's one of those debates and it goes back to our view is that we have a River Murray Act now which supersedes past agreements and at the end of the day if there is a disaster we're all in it together anyway.

DR CRAIK: That's right. The community won't discriminate.

MS CAMPANA (SALGA): However, let's not wait for the disaster is the position that we're taking. So we are doing some joint work at the moment with the state to try and identify where all these levee banks are and what might be involved in adapting them. But you still come back to the question that Adam has raised before about, is that what you should really be doing? Is there something else you can be doing? So it seems to me that we still haven't got it worked out in terms of roles and responsibilities and that we do have some somewhat immediate issues that we're not clear about yet, and time may overtake us in terms of a disaster occurring. Some people might argue that's not climate change, that's other issues; but at the end of the day we do have flooding potential in some areas that needs to be sorted out pretty quickly.

DR CRAIK: This whole issue of things like disaster mitigation infrastructure has been quite an issue in the inquiry, and the insurance industry certainly is very keen to see more disaster mitigation structures put in place. But under the National Disaster Relief Response blah blah blah, arrangements and the national partnerships arrangements there's only something like $27 million for mitigation.

MS CAMPANA (SALGA): That's right.

DR CRAIK: In the event of some floods and fires and things billions of dollars have been paid out and they need to kind of rebalance the funding but also change some of the incentives. The question is, why aren't these mitigation things being done and why isn't, say, local government or even state government doing them

when the benefits seem to be quite clear, certainly in some places like Emerald and Roma where we're advised that the cost of a levee might be anything - you know, maybe two to nine million dollars around Roma. They have been flooded three times in the last three years.

MS CAMPANA (SALGA): Yes.

DR CRAIK: It must have cost more then $15 million to kind of - - -

MS CAMPANA (SALGA): That's right.

MR GRAY (SALGA): The interesting observation that we had from working with a council in the north that has a levee bank was that there was actually no legal requirement or responsibility for the council to actually invest in protecting that community with a levee bank. There's a whole host of other pressures on the council to do that, obviously. But once the council has made that investment and put it in there's no going back, and so it's then an ongoing regime or a transformational shift to something else. So it really does create that a very early initial assessment is so important because once you go down a path it's very difficult in the context of a broader community to turn around and go back. So we've never seen a levy bank so far get pulled down or bulldozed.

DR BYRON: I was wondering about the same question. The vulnerability assessments that you mentioned presumably identify some disaster mitigation options that are available and many of the local governments we've spoken to have expressed some frustration that they find them but then getting them funded is an entirely different question.

MS CAMPANA (SALGA): That's right.

DR BYRON: Again, because of the importance of disaster mitigation measures, the insurance companies still offering coverage were focused on if these potential measures aren't being built, even though they have been identified, is that a barrier that we need to address, some sort of institutional arrangements that aren't working as sweetly as they should?

MS CAMPANA (SALGA): I think it is a major issue. It comes down to money at the end of the day too. In local government, we often use the term, "Water and other things don't respect council boundaries," so for one council to have to fork out considerable funds because it happens to land in their community seems inequitable. I think that there's an issue for local government working more regionally. I think whilst we do some really good things regionally, I'm not sure we do as much as we can do. We've got a project under our Local Excellence program which we might just briefly mention to you and send information on.

DR CRAIK: Yes, that would be good.

MS CAMPANA (SALGA): The Local Excellence program is looking at the future of local government in the next 10 to 20 years. What should our role and functions look like? What will our financial arrangements look like, our service delivery standards, our governance practices, a whole range of issues, and we're doing it with an independent panel. They will report in October next year. The panel is chaired by an ex-minister of planning and local government, a man by the name of Greg Crafter, a highly respected man in South Australia. We also have an ex-environmental resources court judge, Christine Trenorden, and an academic who is internationally known for local government work and is chairing in New South Wales a panel of reform, a guy called Graeme Sanderson. We've got three independent having a good look at us and these issues will go into the mix.

But I think at the end of the day, part of our work in supporting that group is to have a really good look at regions. When should something be done on a regional basis that everybody contributes to? When is something really a state government responsibility or a joint responsibility or state, local, federal? In my view, all spheres of government just make a decision but we have no criteria upon which we make those decisions, so we're wanting to have a conversation with our sector and with the other two spheres about, "What's the reasonable response?" because I think until we can land on that, we're going to be throwing it at each other saying, "You should do it," or, "We should do it," or whatever. So it would be great to see recommendations in your report that talks about trying to provide some parameters to help that decision-making occur.

DR CRAIK: It's certainly an issue and it seems to be an issue nationally.

MS CAMPANA (SALGA): Yes.

DR CRAIK: So, yes, it's something we will be reflecting on in that report. If you could send us that information, that would be good. Unfortunately we're going to have to call a halt to it, but thanks very much for all the information. Thanks very much for coming today. I must say you seem like a very progressive lot in South Australia.

MS CAMPANA (SALGA): Thank you, and good luck with it.

MR GRAY (SALGA): Thank you.

MS CAMPANA (SALGA): We're looking forward to the final report.

DR CRAIK: Thanks very much.

DR CRAIK: Next up we have Prof Wasim Saman from the University of South Australia. Wasim, if you could take a seat and state your name and position for the record, and then if you would like to make a brief opening statement. Thank you.

PROF SAMAN (USA): My name is Wasim Saman. I am professor of sustainable energy engineering at the University of South Australia. Today I'd like to speak about heatwaves, which is certainly a rather silent component to adaptation to climate change and the need to do something about it. No doubt you are aware of some of the studies, including the recent PricewaterhouseCoopers and CSIRO work which show that deaths from heatwaves have and are likely to exceed those from other climate change responses or results.

I am currently leading a national project to develop a framework for adaptation of Australian households to heatwaves and also doing some work with the Multiple Sclerosis Society to look at the impact of the need for controlling the temperature for a number of medically required people, the associated impact on the cost and use of airconditioning and the impact of climate change likely to be associated with it. Certainly the results from the current analysis is suggesting that the number and severity of heatwaves is going to increase. I won't give you numbers; I'm sure you've seen some of them. What we are doing is to look at ways of how households in particular, with the focus on the more vulnerable sections of society, are going to be impacted by and adapt to heatwaves.

One of our first parts of the work is developing climate data for use in design of buildings. At the moment, buildings are designed using historical data which was gathered over the last 30 or more years and we are developing new sets of data for 2030 and 2050 so that new buildings are designed to cope with the expected climate and certainly heatwave activity during 2030 and 2050 - as you well know, the buildings we're building now will be there in 2050 and well beyond - so we need to ensure that happens. But also we're looking at means for designing the homes and the buildings in such a way so that the occupants are less impacted by heatwaves and this includes certainly looking at finding some, if you like, heatwave shelters within their houses, certainly central locations within the house, and particularly rooms which are a little below ground level, not necessarily fully, but they can provide much better protection against heatwaves.

The typical response of households to heatwaves at the moment is obviously to turn on the airconditioners and this is certainly an important aspect that we need to keep track of. So we're looking at how much more airconditioning is going to be required as a result of more heatwaves and the implications on household costs and electricity use but also the future needs for infrastructure to provide electricity for that is also an important aspect.

Some of the current recommendations that I might be able to make on the basis

of our study which is still ongoing includes that we need to ensure that this new climatic data is used by the building industry and this could be done through education as well as through regulatory frameworks. Certainly we would like to see the current activity in developing regulatory frameworks for buildings considering peak damage requirements as well as reduction of energy use. At the moment there's a lot we're talking about and we're doing regarding reducing energy use and emissions through star ratings and other methodologies. We need to incorporate the need to reduce the peak demand for cooling as another important criterion for building an energy rating, certainly looking at supporting the vulnerable people in society, including the medically required, the aged and the low income people, looking at supporting then against heatwaves because a lot of them now are suffering and certainly the level of discomfort is likely to increase.

The other important aspect is looking at raising the bar for the so-called minimum energy performance standards for airconditioners because they're going to be responsible for people's energy bills, as well as, more importantly perhaps, the size of our electricity system and obviously that is an important aspect in determining the cost of electricity at the moment.

DR CRAIK: Thank you very much. One of the other inquiries we are doing is one on regulation or the electricity sector, so this whole issue of peak demand and the cost of what's required to sustain peak demand and the impacts of in terms of price are under our attention as well. Thanks very much for coming along today and giving us that information.

MR COPPEL: Thank you very much for your introductory remarks. Maybe I can just ask a few further questions clarifying the scope of the research that you're doing. It wasn't quite clear to me whether you're just focusing on these impacts in South Australia or you have a broader scope than that?

PROF SAMAN (USA): No, it's a national project. We have colleagues in three other universities apart from the University of South Australia around Australia and, for example, we're developing data for 80 climate zones in Australia, not just for a particular location, and we're doing our studies in improving the new house and existing house designs for different climate zones in Australia and certainly we are looking at the country as a whole in all the aspects of the work. We are looking at people's responses to heat waves in three locations in Australia in selected households around Australia and monitoring their energy use for airconditioning again in three climate zones in Australia.

MR COPPEL: You mentioned heatwaves, are you also looking the implications of rising temperature or is the emphasis strictly on episodes of heatwaves?

PROF SAMAN (USA): We are looking at the annual energy use for the

airconditioning and the rising temperature is important. But we believe that the extreme weather events are going to be more significant in determining people's responses and comfort and even cost because certainly, as you know - especially in your other inquiry - electricity prices are very much being impacted by electricity infrastructure and heatwaves which is happening maybe a few hours in the year in some cases but has a big impact.

MR COPPEL: You also mention that your aim is that this data will feed into building regulation and I am wondering whether you have had any sense of how this work is feeding into initial thinking in terms of changes to building regulation.

PROF SAMAN (USA): At the end of the day the data and the information need to be incorporated in the Building Code of Australia and through the star rating systems for building. In both cases we need a national approach but I know that state governments now opt in or out of some of these regulations and codes for use of the data. So we are doing the work in collaboration with some of these bodies but we need to make sure that the outcomes are incorporated in the regulatory framework through the ABCB, the Australian Building Codes Board, and the Department for Climate Change and Energy Efficiency which, along with COAG arrangements, developed the star rating for housing.

MR COPPEL: You are probably familiar - and we have heard it through the period of conducting this inquiry - that changes to the Australian Building Code can be quite lengthy, the evidentiary requirements are high, there has been a sense that the code is about the current climate but it is very difficult to factor in expected future climate changes into the building code and all of this leads to a very protracted process. Do you have any views on the building code process and how it works to take on board future climate requirements?

PROF SAMAN (USA): I'm very much aware of the fact that incorporating any changes in the code takes three years or more. But that is why I think educating these building designers and giving them the information even before we regulate is important to explain why this is necessary. The government processes incorporating changes always are lengthy and that's why we believe education to architects and airconditioning system designers and others are the first step in doing that. But I'm not sure how we can accelerate changes in the code, for example. However, there is currently an overall review of energy regulations, both for housing and larger buildings and I am hoping that some of our findings are taken on board in the proposed changes for the energy rating of buildings, both large and small, domestic as well as commercial and other large buildings.

MR COPPEL: One final question. In your research you also focus on the behavioural response of households to heatwaves and focus particularly on disadvantaged groups. I was wondering if you had any sense on the differences in

behavioural response between the disadvantaged group and the more privileged group.

PROF SAMAN (USA): Yes, we have conducted some surveys and we have some initial results and certainly many people are not able to afford operating their airconditioners for long enough and some people actually leave home and go to a shopping centre or to some other place where it's cooler during heatwaves. Obviously the better-off members of society can afford just to turn on more airconditioning. Having said that, the majority of houses, as well as other buildings in Australia are moving to airconditioning. Maybe 10 years ago it wasn't the majority but now all new buildings, all new houses are incorporating airconditioning.

MR COPPEL: You make the point that responding to heatwave throughout airconditioning for households that are underprivileged is an affordability constraint. Are there other measures that could be adopted that adapt to the impact or respond to the impact of heatwaves that could be taken that for one reason or another are not implemented.

PROF SAMAN (USA): We are looking at some changes in designing houses and units that will make them more, if you like, heatwave friendly and, as I said, looking at including a heatwave safe area in the house is one. It's more difficult with existing homes but again, there may be. Some of the, if you like, energy efficiency type measures such as insulation and increasing the thermal mass and shading will improve obviously the temperatures in the house and make them more comfortable during heatwaves. But also there are specific design features to shelter a particular zone in the house will certainly do a lot to reduce the temperature and reduce the discomfort and other consequences of heatwaves.

MR COPPEL: Are there particular policies or regulations that are making those adaptations more difficult to put in place?

PROF SAMAN (USA): Not at the moment but my comment here is that it's not appropriate just to look at reducing energy use by itself without looking at the extreme conditions and how to cope in extreme conditions in the regulatory framework. We shouldn't just be hung up - I'm very much an energy efficiency enthusiast and supporter and we do a lot of work in improving the performance from the energy efficiency point of view, but this shouldn't be the only measure. The regulations should also consider how houses behave during extreme weather events in terms of the regulatory framework. That would be certainly something important because we can have a home which will use less energy during the whole year but during the heatwave, we're going to need more energy than normal and we don't want that to happen.

DR BYRON: I'm reminded on that that the survey that was done a few years ago - I

think it was the Master Builders - asked home buyers, "If you had an extra thousand dollars would you rather have more insulation in the walls or a marble benchtop?" and almost 90 per cent would say the marble benchtop. I think if you asked the same question today, "Would you rather have an area of the house that was safe from heatwaves or would you rather have fancy ceramic tiles in the bathroom?" they would probably go for the decorative rather than the one that's actually health important. So is there some educational issue there?

PROF SAMAN (USA): I think the educational issue is particularly for the industry because it's industry who, if you like, markets the housing and the building. Even now, even in some of our better designed developments, what is marketed is the marble benchtop rather than the energy efficiency. That's why I think it's important the industry is educated and also that there's a regulatory framework to support the improvement of our building performance.

DR BYRON: There seems to be two strands to this; one is to try and sort of hardwire into the construction, the hardware, and the other is working with the behaviour of the operator, the way people react. As I think you mentioned, the frequency of airconditioners installed in homes has changed greatly in the last decade, probably because China started selling them at very, very low prices compared to previously. That's created a huge increase in peak load in summertime. But because that's relatively recent and possibly reversible, is the alternative response to try and move towards either housing designs that don't rely on just putting in an even better airconditioner or the behavioural responses of educating people about where to go in a heatwave to be safe? There seem to be choices, whether we go hardware or behaviour.

PROF SAMAN (USA): I think it needs to be a combination of both. Certainly people need to be more educated to know how to respond to heatwaves but I think more importantly we need to make sure that our regulatory framework ensures that when we are building our homes, they are properly designed to reduce the impact of heatwaves so they are comfortable throughout the year and also to reduce the energy use generally. There's plenty for us to do there and there's plenty of examples in Europe which show that they don't need as much heating as we do, even though they have more severe conditions in winter, for example.

DR CRAIK: It's interesting how houses in Queensland, for instance, went from being wooden on stilts and quite cool in hot weather to concrete blocks on slab on ground because it's easier and I suppose it's cheaper.

DR BYRON: I think Prof Williams at the University of Adelaide has designed some houses that have almost zero energy in what's required for either heating or cooling, even in extreme conditions. So it seems to me that if we really think about design, it's possible to design houses for a wide range of environments, but most of

the houses that are put up don't incorporate those really good design features.

PROF SAMAN (USA): Our group and I are personally involved with a whole new housing development in Lochiel Park here in Adelaide - I don't know if you're familiar with it - but we have been involved in the process of building the houses and getting environmental guidelines for the builders and the users and we are monitoring the energy performance in detail and quite a large number of those houses don't need any electricity, net electricity from the grid, and many of them use very little for airconditioning. They use about a third or less energy for heating and cooling - and I'm talking about the whole development, not an individual home - so it is doable.

DR BYRON: So there are no barriers to adaptation in that direction.

PROF SAMAN (USA): Yes.

DR CRAIK: What about the cost?

PROF SAMAN (USA): The cost, certainly being the first cab off the rank, is a little higher but it's not significant in comparison - - -

DR CRAIK: 5, 10 per cent or what?

PROF SAMAN (USA): It's less than 5 per cent and it's not significant in relation to the cost of the house. The typical home at the moment will be, in South Australia, four to five hundred thousand, and maybe we are looking at 20,000 extra or 30,000 extra.

DR CRAIK: That's interesting.

PROF SAMAN (USA): This is possible with more education, looking forward. With the increase in the electricity prices, this is becoming a lot more necessary.

DR CRAIK: Is there information available on that, Wasim?

PROF SAMAN (USA): On Lochiel Park, yes, of course, and I'm happy to send you some.

DR CRAIK: Could you send us some?

PROF SAMAN (USA): I'm happy to send you that. We have a number of publications and we have international visitors that come and see Lochiel Park.

DR CRAIK: That would be good.

PROF SAMAN (USA): We talk about it in international fora.

DR CRAIK: That would be good if you could send us some.

PROF SAMAN (USA): Certainly, I'd be happy to.

DR CRAIK: Thank you.

DR BYRON: Thanks.

DR CRAIK: Thank you very much. Yes, that's been very interesting actually. I hope it goes well. Thanks very much Wasim.

PROF SAMAN (USA): Thank you.

DR CRAIK: Finally this morning we have Peter Hayman from the South Australian Research and Development Institute. Peter, if you could state your name and position for the record, then if you would like to make a brief opening statement, we'd be happy to hear from you.

MR HAYMAN (SARDI): I'm Peter Hayman and I'm principal scientist in climate applications with SARDI which is the South Australian Research and Development Institute which is the research arm of the primary industries in South Australia. I'm an agricultural scientist who has worked in climate applications. Prior to coming to South Australia in 2004, I led the climate applications unit in the New South Wales Department of Primary Industries. So I guess my background is really applying the science of climate variability, El Nino and so on, to agricultural systems, and climate change has emerged as an issue within that in terms of impact and adaptation. Here in South Australia we're working mainly with low rainfall farming systems, work on Goyder's Line and viability in those regions, with high-value viticulture, in dealing with the recent heatwaves and water and so on for them.

In terms of background too, I'm a member of the Primary Industries Adaptation Research Network which is part of NCCARF, National Climate Change Adaptation Research Facility, so one of the networks there, and also been involved in the climate change research strategy for primary industries and the rounds of that.

Just in responding to the report, I found the report challenging. I guess I've come from a background of agricultural extension which had a big role of government and clearly I, through my working life, have seen the role of government shrinking and becoming a more refined role there and I can see there's many advantages of that and how some of the aspects of how the sky would fall in hasn't happened, and consultants and so on in agriculture play a really valuable role in that; I recognise that whilst there is market failure, there's also government failure as well and how we balance that and so on.

Much of the report is about policy and much of the report is about policy within urban areas. I guess the bit that I'm interested in engaging a bit on is the role of information and the role of information in rural areas; that's partly about the questions of what is the appropriate role of government and provision of information in these areas, and I guess in that some caution, perhaps an overemphasis, on climate change projections only and downscaling because I think we've come from a situation where there was a strong emphasis on that. I would see in South Australia less emphasis on climate change projections and more emphasis on just getting on with adaptation.

DR CRAIK: Thanks very much, Peter. Thanks for coming along today and I gather you contributed to the South Australian government submission, so thank you.

DR BYRON: You're absolutely right, Peter. We did spend a lot of time in the report thinking about provision of information by governments and the question is: what sort of information is most useful? A few people have said more detail, more downscaling, as if that would enable them to work out exactly what needed to be done and they would be able to get on and do it. You're one of the few sort of cautionary voices about more detail, so could you elaborate a bit more for the record on why you're expressing those cautions about downscaling. Is it unhelpful or just less helpful than other things we could be doing?

MR HAYMAN (SARDI): I think it's really coming from my experience in South Australia where for southern Australia, clearly a major question is the uncertainty on precipitation projections. So we're in a region which has lived through a recent drought, we're in a region where there's a consistency among the global climate models of a drying for southern Australia, however a big range in that drying.

However, the range of broad-scale global climate models still give a big range of future precipitation and I can't see that we get around that and I can't see that downscaling resolves that critical question. If I felt that downscaling would give us more certainty on that critical question, I'd say there would be advantages in that. I don't see that downscaling gives us a lot of spatial resolution on temperature. It tends to give it much the same story on temperature across regions and I guess my concern is that it has a big emphasis on spatial resolution, whereas I would see that firstly I question how well that can be resolved because for every location, there will still be a wide range of future precipitation; secondly, I think other questions for agriculture, like seasonality of rainfall are probably as or more important than a fine spatial resolution, so it sort of focuses us on the wrong questions.

I think in no way am I questioning an important role for climate science to be doing this and to be funded and arguing about it in conferences and so on, but I note that different downscaling methods can reverse the sign of the precipitation projections - Penny Whetton has shown that - and that has to be concerning, before we have a big emphasis on operationalising this. But I think at a more fundamental level, it's a very climate science-centric view to adaptation rather than just saying, "Let's get on with preparing for a warmer, drier future." We know some of that information and we've got confidence about more drying in winter than summer, but I think there's enough information there to start working on adaptation rather than waiting for that information.

DR BYRON: A number of people have commented that they thought that we overstated the amount of uncertainty in making decisions about adaptation. They were probably, in my view, thinking about scientific uncertainty about climate but in fact there are many other sorts of uncertainty about future markets and products and raw materials and fertiliser prices and all the rest of it that would affect agricultural decision-making going forward. So in terms of information provision to agriculture,

what sort of information is necessary to enable people to, in your words, get on with the business of adaptation?

MR HAYMAN (SARDI): I think it is important that we give them the best climate information and that will be the best information from the fifth assessment round and because the Department of Climate Change will be doing this for the NRM regions, mostly that will be available. So I'm not suggesting that we don't give that information.

DR BYRON: Yes. What else?

MR HAYMAN (SARDI): But in addition to that, in the work we've done, it's actually been engaging on how far into a drying trend would some of the more water use efficient methods and so on go, so what level of drying would start to be really problematic for some of these low rainfall farming areas and so on. I guess that I see that we complement the climate projections with this sort of robust climate sensitivity which is informed by the projections. I think we can also use spatial analogues and we've got a project here - one clear feature of South Australia is you haven't got to go very far and you go across very rapid rainfall gradients. So if you're trying to guess what a warmer, drier future might be, you just hop in a car and visit it.

DR BYRON: It's a hundred miles north.

MR HAYMAN (SARDI): Yes, so you haven't got to go very far to see that. Also, I think there's the temporal analogue of the drought; what have we learnt from the drought in terms of management and so on. I think in terms of thinking about future climates, we can work on these four aspects of climate projections, spatial analogues, temporal analogues and the sensitivity; using that in terms of impact models, like cropping systems models and so on, and with some farm management economics to think through this. There's an NCCARF-funded project with the University of Sydney on real options with Greg Hertzler, working with some of these ideas of, I guess, if there's a lot of volatility in the future, it's hard to make the switch because you're always in there hoping for a good outcome and so on. I guess that comes back to that sort of information with consultants working with farm models that make sense in the current climate across what deciles things are working now and working in that sort of way.

I think that all works for the coming decades. I think trying to guess a four-degree temperature rise and 50 per cent rainfall decline and so on is very difficult to do because when you do that, a whole lot of other assumptions go away, so I guess I would see this in the near future which is this interesting combination of climate variability, decadal variability and the signals of climate change.

DR BYRON: So does that mean that you think we've been naive or optimistic in

saying that Australian farmers experienced in coping with extreme climate variability has given them some insights into what they might have to do to cope with climate adaptation?

MR HAYMAN (SARDI): Firstly, I would concede it's easy to over-invest in this area of climate change adaptation versus variability and productivity but I think it's also possible to under-invest because I think it does raise some questions about how do you manage risk in a non-stationary climate. I do think that the sort of training I had in climate risk and so on was very much assuming stationarity and I think that we have clear evidence that there is not stationarity and temperature and it's probably wise to think about non-stationarity in rainfall, about how that might change and I think how that gets incorporated into our thinking about risk is an area that is worthy of some ongoing investment and rigorous thinking.

DR BYRON: We have had lots of anecdotal experience of individuals and there are also some industry associations who have realised that they are no longer able to keep using the same farming system in the same place, so they are either relocating or buying land further south or somewhere else or thinking about changing from cropping to pastoral systems and so on. Do you think that is a relatively small minority of the population or do you think that that sort of thinking about options to long-term adaptation is reasonably broad across agriculture in South Australia?

MR HAYMAN (SARDI): I think it is a really interesting area. In one sense business as usual in Australian agriculture has always been very dynamic and very responsive to a whole lot different features and so on and so there has been a whole lot of adaptation that is always happening. I think some of the emphasis on shifting locations and so on has a bit of an overemphasis on the climate aspects of that. The Queensland wine industry is bigger than the Tasmanian wine industry, yet when you hear people talk about it, it's as if the Tasmanian wine industry is somehow enormous. It is a boutique small industry which will grow and there are real opportunities there and so on. But I think there is sometimes a naivety that for hectare of vines you put in Tasmania you will take a hectare of vines out of somewhere like the Barossa. I don't think that's the case.

Even some of these people - the celebrated cases of Brown Bros and so on moving there, they haven't left Rutherglen, they have expanded there. Yalumba buys a lot of fruit from Tasmania but they're a still presence in the Barossa and so on. So I think this notion of new opportunities, in this - the question of how much that was really a shift, in South Australia I guess the really interesting question on this very low rainfall edge is whether people do see that they will swing to pasture from cropping. To date there has actually been an increase in cropping in those areas, even through the drought, so that hasn't happened. Clearly livestock prices coming up have changed that and some of the people around corn and so on that are very dry areas are saying, "Livestock is better than cropping in these regions," but that's partly

because of the very good returns from livestock that there's that swing. Again, that is the complexity in this argument in terms of how we are adjusting these systems now as well.

DR BYRON: It's hard to see the long-tern signal in amongst all the short-term static.

MR HAYMAN (SARDI): I think that is right. There is clearly a lot of noise in all of this and there is noise due to a whole lot of things, like, for example, the relative livestock to cropping prices and so on. I guess that goes back to saying that - and I don't know that it's market failure but I guess I would still see that there is some value in, say, the primary industries' adaptation research network. We ran these masterclasses, they were very competitively sought for and the people who came to them were often RDC officers and so on who were very interested to learn more and from that review of those masterclasses they're saying, "We want more rigour, we want more challenging thinking about this adaptation question."

So I guess I'm saying that, yes, we should be cautious saying that we need to run a whole lot of risk workshops with farmers. As Bill Malcolm said a long time ago there are two assumptions there: one is that farmers need help and the second assumption is that we can help them and the second doesn't necessarily follow from the first and that is true. However, I think you can then go back and say because farmers are so good at variability, they will manage these changes. I would argue in some ways the familiarity - well, firstly, the notion that Australian agriculture is fantastic at variability needs some challenging at times in terms of drought support and so on. Secondly, the notion that because we're familiar with variability we can handle change. It can actually be a liability because you have the sense, we've handled all this, we've got records that go back, we overemphasise, if you like, the year-to-year variability rather than the longer term signal. I think Australian agriculture's extreme comfort with variability is one sense a real strength but in another sense can be a source of a weakness in terms of deal with future change.

DR BYRON: A last question on the information side is a lot of the behavioural literature I read said that if you just tell people that three bad things are going to happen one response is paralysis of fear and they end up doing nothing. But if you tell them that , "These three things are going to happen but here are three options of how you could respond to that that might work for you," then you start getting a positive engagement. So in terms of information, do you think there is enough coming out in terms of option for, whether it's technology or behaviour or markets or whatever of how primary producers can respond to temperature and rainfall shocks that are coming, rather than just warnings that it's going to be hotter and drier.

MR HAYMAN (SARDI): I think we are moving to that and I think we're doing a better job of that, of giving more emphasis on the adaptation and the options. I guess

I would see that one of the challenges is to then do work on how far can these adaptation options take us into a warming, drying trend, if that makes sense. So to actually emphasise them but also I would think part of the R and D associated with that is also working on the limits to some of those.

DR BYRON: The corollary of that is that it's not a one adaptation measure will fix everything so that it might be, "Well, here are three things that might work for you until we get plus three degrees but then you might have to start looking at X, Y and Z instead and some transition path between the short-term responses and the ones that might follow in another X years to make sure the short-term ones aren't a cul-de-sac."

MR HAYMAN (SARDI): Yes. I see there that it's important to look at the transformational changes but I think it's also important to mainstream climate change into the climate variability and productivity discussion. So actually in terms of Mark Howden's famous diagram of adjustment and then - I think sometimes the argument is the adjustment is all just done by our current variability and productivity research. I think there is actually a need for engaging some climate change discussion back into there as well as the transformation.

DR CRAIK: Thanks very much, Peter, for coming along and for your input today and for your input into the submission. That completes the scheduled proceedings for today. For the record, is there anyone else who wants to appear briefly before the commission? I adjourn the proceedings. Thank you very much.

AT 11.29 PM THE INQUIRY WAS ADJOURNED ACCORDINGLY