



**LEGISLATIVE ASSEMBLY FOR THE AUSTRALIAN CAPITAL
TERRITORY**

**STANDING COMMITTEE ON CLIMATE CHANGE,
ENVIRONMENT AND WATER**

(Reference: ACT greenhouse gas reduction targets)

Members:

**MS M HUNTER (The Chair)
MS M PORTER (The Deputy Chair)
MR Z SESELJA**

TRANSCRIPT OF EVIDENCE

CANBERRA

FRIDAY, 8 MAY 2009

**Secretary to the committee:
Dr H Jaireth (Ph: 6205 0137)**

By authority of the Legislative Assembly for the Australian Capital Territory

Submissions, answers to questions on notice and other documents relevant to this inquiry that have been authorised for publication by the committee may be obtained from the Committee Office of the Legislative Assembly (Ph: 6205 0127).

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Amended 21 January 2009

The committee met at 9.30 am.

COSTELLO, MR MICHAEL, Chief Executive Officer, ActewAGL

O'HARA, MRS DIANNE, General Manager, Business Development and Strategy, ActewAGL

O'NEILL, MR CAMERON, Principal Economist, Access Economics

SIMES, MR RIC, Chief Strategist, Access Economics

SULLIVAN, MR MARK, Managing Director, ACTEW Corporation

DICKSON, MS KIRILLY, Sustainability Manager, ACTEW Corporation

KNEE, MR ROSS, Principal Strategic Planner, ACTEW Corporation

THE CHAIR: Good morning, and welcome to this public hearing of the Standing Committee on Climate Change, Environment and Water, inquiring into the ACT greenhouse reduction targets. This morning we are hearing from ActewAGL, appearing with representatives of Access Economics, and also from ACTEW Corporation. As you can appreciate, committee members have had a very busy budget sitting week, so please bear with us if the strain is starting to show a little bit.

Witnesses, I understand that the secretary has sent you a copy of the privilege statement. Would you please confirm that you understand the content of the privilege statement that is before you. I will ask you to do that as you speak. Mr Costello, would you like to make an opening statement?

Mr Costello: Yes thanks, Chair. I have read the privilege document. We have put in a submission to the committee. I want to say a few things at the start. Our purpose in being here today, obviously, is to respond to your command, but also we want to be here to contribute positively to a public debate.

We are strongly supportive of action to address CO₂ emission equivalents. Our partner AGL, one of our two owners—three owners, I guess—is the biggest renewable energy generator in Australia by far, is committed to continuing that and growing its renewable energy technologies and is very supportive of our thoughts on solar power in the ACT.

We support a CPRS, not least because of the certainty it would provide if and when it is implemented—something very important to the energy sector. We support a strong renewable energy target. We have a very successful green energy program in Canberra—I think the most successful in Australia. We support and would like to be involved in environmentally friendly energy generation. I have mentioned solar already. If, after an inquiry into the energy sector, the Assembly decides that gas, as a transition fuel, is a suitable and acceptable thing, we would like to be involved in that.

We are strongly supportive of efficiency measures, which we argue in this paper is possibly the most effective and certainly the most cost-effective way to proceed. It

reduces demand for our product, but despite that we are very strongly supportive of it and would like to be part of it.

We strongly support the idea of offsets. My own personal view is that it is an underdeveloped area of policy, both nationally and internationally. The ACT produces 0.2 per cent of greenhouse gas emissions in Australia in a direct fashion, according to the figures we have made available in this paper. And most of that direct use comes from transport. However, most of our greenhouse gas emissions come from indirect use—that is, electricity consumption. Seventy-two per cent of our greenhouse gas emissions come from that. That brings us to about 0.35 per cent of Australian greenhouse gas emissions.

In addressing this subject, we have, like most others, two key thoughts. The first is that we support measures that are effective, that actually make a difference, that are not about ourselves but about actually making a difference in containing and reducing greenhouse gas emissions. The second thing we are looking for is the least cost, because in the end, the community does pay, one way or another, for any increased costs that flow from this.

The interesting thing is that, for ActewAGL's own narrow self-interest, most of these answers will not have a direct impact on us. That is because, under the system that operates, the regulator will take into account any changes of this kind and will flow through the increased impact on cost for us into pricing policy. Thus, with respect to the feed-in tariff that has been instituted in Canberra for residential use, the Australian Energy Regulator has included that in our cost structure and compensated us for the increased cost, and the Independent Competition and Regulatory Commissioner, Mr Baxter, has included the extra costs on the retail side.

If I can put it this way, we are looking less at self-interest than you might have thought. We are here to contribute to a public debate. Others are more directly impacted—those who are in the generation business.

The four key principles which we think in the ACT it is worth approaching this on are, first of all, looking at all these issues in a national setting. In a sense, if we were to double the targets here that were set nationally, that would not actually reduce national emissions at all. That would simply allow those emissions to take place elsewhere in Australia. This is the problem that was identified when people wanted to do things themselves and yet it just disappeared into the system, and that is a systemic problem. So that is worth considering. It does not mean that our having more ambitious targets is not a good thing and that, if you do it right, it will not have an impact. But in general, I think it is fair to say—and I will perhaps ask Mr Simes a little later to talk more about this—that, in a system where you have national targets, if we have very high targets above that, it will just take those emissions elsewhere in the country. It is the same problem as you face as a nation.

Particularly given that 72 per cent of our greenhouse gas emissions come from electricity generation, the indirect costs of electricity generation, we have to think not just about how to reduce our greenhouse gas emissions within Canberra itself but how we might contribute to lower costs, to having more renewable energy and more energy efficient, environmentally friendly generation to the national electricity grid,

which, after all, is what supplies us. When we buy energy, we buy an amount of renewable energy from around Australia. When we buy normal energy, non-renewable, we are buying it from the national electricity market, which includes black coal and brown coal. So if we want to have an impact on 72 per cent of our greenhouse gas emissions, just looking at the ACT and at what happens in the ACT may not necessarily have an impact.

We are looking at the second principle—flexibility. This is a very new area of activity. In the first four, five or six years there is going to be lots of uncertainty, there will be lots of mistakes with the best of intentions, things will work, some will not, information and databases will have to be established. With lots of new technologies which people are trying out, you will not know whether they are going to work for another three, four or five years. We need to be flexible in how we approach things during that first period, particularly. It does not mean that you do not have the targets, but how you go about it needs to be carefully and flexibly addressed.

You need to have the third principle. You need always, it seems to me, to look to the lowest cost option for an equivalent effectiveness. There have been many, and we have got a couple in here, which show various charts about what is effective and what is not, what is most cost effective and what is not. There are arguments within those charts about which is the highest, but it does pretty well appear that the least cost and the most bang for the buck for the consumer comes from energy efficiency, which is often a matter of organisation and planning rather than raising energy costs directly.

Finally, it is the interaction of a range of measures that is important, not just one measure. The simple fact is that, in this city, we have no generation. Our power comes from outside. We have very little industry that is a heavy user of energy and we have very little agriculture. So within the ACT itself, you can see from the chart that overwhelmingly the direct use comes from transport. That is the area that you will directly have to address to make a real difference.

Let me conclude by saying that we want to be part of this and we want to be part of a positive outcome. But we want to be part of an outcome—and I think the ACT government and the Assembly at large want this—that actually makes a difference and has some impact. We are happy to contribute to that. Thank you.

THE CHAIR: Thank you, Mr Costello. You raised the issue around the national setting and the need for the policy at the national level as well. Are you saying that you do not think the ACT should take any action until the federal government policy settings are in place?

Mr Costello: No, I am not saying that at all. But if there is a national target set, whether it is five per cent or, after Copenhagen, 25 per cent by 2020, if that is set and then we take action above that, if it is so much more expensive that it makes a difference to both residents and industry, they will take their activity elsewhere—that is not surprising—or that business will be conducted elsewhere. That will be the natural reaction. I guess what I am saying is: there is no way that a place that produces 0.2 per cent directly of greenhouse gas emissions and indirectly at 0.35 per cent, can make a difference nationally just on its own by its own actions.

I am very strongly supportive, and I think the thing that I would see—and my colleagues who probably understand this better than I do may want to join in here—that the ACT can do right now, even before the federal government, is to focus on energy efficiency. That does make a difference directly, it is a least-cost option and it is something people would want to be involved in. I know there are a number of policies that have been announced already as part of your agreement with the government that do advance those things, and we are very supportive of those. The other thing you can do, of course, is to require a much greater use of green energy in the ACT, the purchase of green energy, which would flow through directly into prices.

THE CHAIR: Picking up on your point around the energy efficiency and the large potential for savings there, what is your support for mandating as many efficiency standards as possible, rather than leaving the uptake to voluntary action, which we know is not necessarily the most effective?

Mr Costello: I certainly have no objection to it. Once again, you have got to balance that. If you have it at a level that is so different from everywhere else, that is a disincentive to live here or to do business here, and you will simply shift that activity elsewhere. I guess that is the constant balance that the ACT, as a very small jurisdiction, has to weigh. It comes back to this point I was making before: there is no point in doing things for the sake of doing them. You actually want to have an impact. You actually want to make a difference, and what makes a difference is what makes a difference to the country, not makes a difference just to the ACT and this particular territory.

THE CHAIR: And you have stated your support for the CPRS. What kind of policies do you think are compatible if the CPRS was in place and if the CPRS was not in place?

Mr Costello: From our point of view, if the CPRS is in place then gradually the price of energy will go up. There will be more use of renewable energy and, with more use, necessarily, depending on how fast it goes up, more use of gas as a transition fuel. They will have to. If you see the numbers we have got in there, even at a 20 to 25 per cent target, you would have to use gas on a substantial scale as a transition fuel. There would be no choice. Otherwise, you cannot get rid of your black or brown coal. You have to have that as well as renewables, because, with most of the renewables at work at the moment—that is, wind and solar—when the wind does not blow and the sun does not shine, the power is not available.

I understand that the more there is, that wind will blow somewhere in Australia and the time at which the sun tends to go down in each state is within two or three hours of each other. So you do need something to fill in those gaps, and the fuel that does that most effectively on a large scale is peaking gas plants. I guess this will be our presentation to the energy inquiry which I understand is being undertaken. We see a place for the ACT to be involved in energy generation, because when you build a generator as a public utility, it is not to supply a particular city or town. You have to feed it into the network. So we would be contributing to a greener national grid. That is the way we think of this.

Our solar power station, if we build it, would contribute to the national grid and we

would buy more green energy from the national grid to reflect that. If we were to build a peaking power plant, a gas-powered peaking power plant, 50 per cent more greenhouse gas efficient than coal, and more so in the case of black coal over brown coal, that would contribute to the national effort. That is what I mean by trying to do this in a national setting and seeing ourselves as part of the national effort. The more you get away from that then the harder it is to actually make a difference, even though there are substantial costs. Can I ask Mr Simes to add to that?

THE CHAIR: Certainly.

Mr Simes: I have read the privileges document. I have a couple of comments about what has been said so far. First of all, it is very important from an economic point of view, if we are going to keep costs to a minimum while making the adjustment, to recognise that the most effective way of doing this is to be able to change the nature of the capital stock over time in the country to a much more efficient capital stock. That takes time. If we take any action that is directed at reducing the total amount of energy consumption without changing our capital stock, that is going to hit economic activity very hard. So that means that all the transition arrangements become very important.

In the CPRS, in the long term, all we need is a price. The big challenge is: how do we get there in the transition in an effective way? So, when you are talking about renewable energy targets or if you are talking about mandated regulations and the like, if those mandated regulations are going to apply to a whole lot of existing capital, it becomes very costly. If it is applying to new capital or new decisions or whatever, it is much less costly. In all of those it is important to work out how to transition to this world in a least-cost way. It seems to me that a lot of what you are talking about is directed at doing that.

THE CHAIR: I suppose, connected with that, have ActewAGL or Actew done any modelling on what you think the overall energy mix for the ACT should be or could be? You have said that we should not be focusing just on two technologies, on, say, wind and solar. I am interested in what you see that energy mix being.

Mr Costello: We do not have any generation. We simply buy green energy from the grid. We do not have the opportunity of saying, “That has to be wind energy; that has to be solar energy.” You are buying energy from the grid that is green energy at a certain price. So it will be renewable and it will be green energy. It will not be, for example—as I understand it currently; you might correct me—gas-fired peaking power energy; it will be wind or solar.

At the moment there is not much else but wind. There is no real solar contribution to the national electricity grid. Overwhelmingly, the renewable energy you are buying, I think, or nearly all of it, is wind power—and of course hydro. Hydro is not fabulously productive at the moment because of the drought.

THE CHAIR: Getting back to that modelling, what do you think for the ACT on an energy mix? Where should we be heading? Are you talking about transitional arrangements? Are you talking about the importance of, I guess, looking at cost and effectiveness? I am just wondering about this energy mix still in the modelling.

Mr Costello: If we are going to contribute to the renewable energy mix in the ACT, we can do it two ways. We can increase our demand for it and pay the extra price. We can have our own. I think it is two per cent at the moment, is it, that is mandated—the green energy requirement if we have to buy it—

Mrs O'Hara: Two to three.

Mr Costello: Two to three. In the ACT we are buying 6½ but that extra bit is voluntary. If you were to impose a higher mix, then, by definition, we will be drawing on the grid for more green power and that will cause more green power to come into it.

MR SESELJA: How much does that currently cost versus non-renewable energy?

Mr Costello: The difference in cost at the moment? The easiest way to do it is by a simple retail description. Our standard tariff for normal energy, if I can put it that way, coal energy, is about 13c a kilowatt hour and for green energy it is about 19c.

MR SESELJA: So that is how you retail and that roughly reflects your costs of buying it?

Mr Costello: Yes.

MR SESELJA: So it is about 50 per cent.

Mr Costello: Yes, about 50 per cent. It is expensive; there is just no escaping it. My view, for what it is worth, is that technology is going to make this a lot cheaper and that is why—perhaps some of the pure economists would disagree with me—I am a strong supporter of some of the mandated renewable energy targets. It forces investment in those areas, and the more investment there is in those areas the better the technology is going to become.

AGL are very keen—a big national player; as I say, the biggest generator of renewables in the country—to be part of the solar power station here, and their reason is not that they think they will make much money out of it, because I do not think they will; the reason is they want to learn how to operate solar power in the national grid and make it work, because it uses a peaking power option largely, particularly during summer. So they want to learn how to use it. I think that is going to be generally the case: the more these things are moved into—it is your transitional point, I think—the costs are going to come down. I think they could come down quite rapidly. I have a personal view. This is a piece of wild, blue sky opinion—

MS PORTER: What is your blue sky, sorry?

Mr Costello: Sorry, I should not have said that. It is just madness. I happen to think that in 30 or 40 years time most of our energy will be coming from—this is crazy stuff, but not so crazy because the Americans are developing this in the defence context—direct-beam, massive solar reflectors in space. I think that is where it is going to go. But that is 30 or 40 years time; we are not there yet.

THE CHAIR: Back here in this time, as you were saying, most of our energy is purchased from across the border. What is your idea of the sort of mix? What should we be generating here in the ACT and what should we still be getting in from across the border?

Mr Costello: I would strongly support the development of solar power here, but it needs substantial subsidy because at the moment it is very much more expensive than wind, which in turn is more expensive than coal. Of course if CPRS comes in and there is a carbon price, that price differential will come down. But at the moment it is going to require a substantial subsidy.

At the briefing that was given by the government to all interested participants—I think it was six weeks ago, in March—they foreshadowed that the \$30 million subsidy that they had talked about in the past would be available. When they were asked would the feed-in tariff be available, they said they were certainly open to that suggestion.

It is up to the government and the Assembly how this is put forward. It seems to me you would not want to put a feed-in tariff price on that; you would let the bidders suggest a price. Then they would have a motivation to suggest the lowest feed-in tariff they possibly could to win the tender, if that was to be part of the tender process. But that is up to the government to do that.

We are very keen on solar energy. Wind power is a bit difficult here. We had a wind power station DA approved out at—

Mrs O’Hara: We have got Woodlawn, Spring Hill and there was one site we were looking at, at Collector, as well. None of those are active at this point in time.

Mr Costello: We have not been able to make the numbers work. We are very interested, as I have said before, in the transitional fuel of gas because we are a big gas retailer but also because we think it is an essential. I think it is generally accepted it will be an essential part of the transition to a green energy environment. The problem with that, as one of your colleagues Shane Rattenbury pointed out, is that a big generator of that kind normally has a 30 or 40-year investment cycle to it and you may only want the transition to last for 20 years. If someone is going to build a plant like that on the basis of a 20-year cycle rather than a 40-year cycle, the cost of tariff is going to be a lot higher than it would be if it was a 40-year investment.

MR SESELJA: On the wind, you have said in the submission that potentially building a wind farm would actually add to emissions in the ACT. How does that work? Can you talk us through that?

Mr Costello: The direct impact of emissions?

MR SESELJA: This is the direct, of the construction phase.

Mr Costello: Yes. That is all.

MR SESELJA: Okay.

Mr Costello: But, in terms of the grid, the national grid—it comes back to this being in a national setting—of course it contributes to the renewable contribution.

MR SESELJA: But I suppose it is a potentially perverse outcome in that you are not meeting your target because you are building a wind farm.

Mr Costello: Precisely. That is right.

MR SESELJA: Even though you are then creating green energy at the end of the day.

Mr Costello: Precisely.

Mrs O'Hara: And the point we were trying to make there is the need for flexibility, because obviously the wind farm option is a good one, but, if our lack of flexibility with targets precludes you actually constructing it, that is certainly not the outcome that we would be wanting.

MS PORTER: Just quickly on the wind farm issues, is one of the impediments, though, the community reaction to having a wind farm situated—

Mr Costello: Could be. But that would go through a DA process, an environmental process, and the community would have its role in the consultation there. But we have not identified a site within the ACT for a wind farm.

MS PORTER: No, I realise that the ACT, I believe, is—

Mr Costello: There is one wonderful site—it is a fabulous site, but it is in a national park, unfortunately.

MS PORTER: I thought it might be. But we do not generate much wind elsewhere, do we?

Mr Costello: Not in the ACT. But we have got three sites, and we are hopeful that as the carbon price goes up they will become economic propositions.

THE CHAIR: Could I just go back to that issue around the flexibility with the target? You basically note that there might be flexibility with the target because the policy measures themselves are more flexible than, say, a CPRS; that target could be adjusted to cater for growth in the ACT. Are you suggesting that we set a target, that we just shift it as we get more people and more growth? Doesn't it just make it a vaguely aspirational sort of policy guidance tool rather than a legislative policy that guides our energy production and consumption?

Mrs O'Hara: Just to start off perhaps with the flexibility there, what we were talking about was, particularly in the early years, setting a target when some of these costs and some of the technologies are still in the very early days. You will find as you start to implement some of these things, as Michael said before, that some things will work, some things will not. What we were trying to get to there is, particularly within those early years, you will need a certain amount of flexibility so you can adjust your targets perhaps to pursue what does work and, if you are finding that a lot of stuff

does not work, you will need a little bit of additional flexibility to still meet your long-term targets but build in that short-term flexibility.

Mr Simes: The other issue longer term is, if the ACT's population is growing faster or slower than the rest of the country, targets relative to the size of the population make more sense than an absolute number. If, for example, in an extreme, the actions were set at such a level that it discouraged economic activity in the territory and that moved to New South Wales or wherever, that would be the worst way to meet a target. If the target was set in terms of the overall scale of the population or the economy or whatever rather than an absolute term, you overcome that issue from a sort of definitional point of view.

Mr Costello: It comes back to this national setting problem, really.

MS PORTER: So what you are saying is that it is very difficult for the ACT to lead and to set a target above—

Mr Costello: No. I think you can be ahead, but, if you are so far ahead you simply push people and business out, you have not achieved anything in practical terms. But, if you are a bit ahead, the marginal difference may not have an impact of the kind that we are talking about. If you have big gaps between targets, undoubtedly people will take themselves and/or their business elsewhere. It is an economic issue, but that is not the argument we are making. The argument we are making is that it does not have any impact in reducing emissions; it just goes elsewhere.

The point about population is related to that same thing, as I understand it.

Mr Simes: Yes.

Mr Costello: About not encouraging people to go elsewhere.

MR SESELJA: Getting back to solar, you talked about the subsidies required, the \$30 million that is sort of on the table and then there would be an ongoing subsidy through user pays. Are you able to take us through that? Obviously, under the CPRS that was proposed—given that it is going to be changed, we do not know what that will be—if that were to have gone ahead, I imagine the analysis was done in relation to that. How much of a subsidy are we talking roughly at the user level to make solar pay or to make solar work?

Mrs O'Hara: The modelling that we have done for the solar farm at this point in time is fairly high level and preliminary in the absence of the tender documentation, but PB, Parsons Brinckerhoff, did that initial study and they were coming out with a cost of about \$254 per megawatt hour. But that also very much depends on the sort of technology you need. The bottom line, I suppose—

Mr Costello: And the size; the scale is very important.

Ms O'Hara: Yes. The bottom line is that we would have to have a look at the exact requirements of the expressions of interest, go through and finally determine what technology we are using, and work it back from there. At the moment, if you look at

your relative costs, if your green power is about 19c, your high-level solar power costs are about 25c, 26c. That gives you some indication of the relativities.

Mr Costello: Whereas one of the advantages of a solar utility that feeds into the grid and is on a reasonable scale is that it is a great deal less expensive than the residential one, as you would expect. The residential one has a lot of capital costs, is small scale and so on. But it is the same. What is being talked about is a solar power utility that would have the capability of supplying 10,000 homes, something like 20 megawatts. If you double the size of that, you substantially reduce the costs. The bigger it is, the more the costs come down. So it will depend very much on the terms of the tender that comes out and what it allows us to offer. It will be an expression of interest and then, after the expressions of interest have concluded, I think the plan is that there will be a sort of reduced—

Mrs O'Hara: A tender.

Mr Costello: There would be a tender with three or four nominated candidates, and at that point you will know precisely what you can offer. But at the moment to give you a price all I can say is that it would be a great deal less than the feed-in tariff on the cost of the solar power generated in residential sites—a great deal less, half or more.

THE CHAIR: In your submission you mention a current target for the ACT under the greenhouse gas abatement scheme of 7.27 tonnes per capita. Can you explain this figure? Is this a current target and how did we reach it? As I understood it, the ACT's per capita emissions were currently around 12 tonnes, so how do you currently offset that balance?

Mr O'Neill: I have read the privileges statement. That number just comes off the ACT government website. I do not know whether that is an aspirational target, but that is, as I understand it from reading the ACT government website, the target of an emissions per capita in the ACT under the current setting of the GGAS. As far as I understand how the policy works, the ACT government has got the GGAS, which is like a mandate of renewable energy purchases target. That is an additional requirement on retailers in the ACT to source electricity through renewable sources. That was the instrument to, I guess, bring down per capita emissions to 7.27. There was mention of a current level of about 12. Yes, I read something—12 to 13 is the current level. That was probably a longer-term target through that GGAS renewable energy purchases scheme. But, as I understand it, that policy is going to be closed down when the CPRS starts. Looking on the GGAS website, they are going to stop it, so that will be replaced by the national renewable energy target.

Mr Costello: That is after 20 per cent by 2020, isn't it?

Mr O'Neill: That is right, yes. That is what the ACT is going to get anyway, a 20 per cent renewable energy target by 2020, so retailers will be purchasing 20 per cent of their electricity from renewables by 2020 under the commonwealth scheme.

MR SESELJA: What is the current take-up of green energy in the ACT, roughly?

Mr Costello: I think about six per cent of our energy consumption is green energy, which is much higher than elsewhere.

MR SESELJA: That is on a household basis—six per cent of households have signed up to it?

Mr Costello: No, six per cent of total consumption. It is much higher on a household basis, I think.

Mrs O'Hara: Yes. We have just over 13,000 Greenchoice customers at the moment, which, as Michael said, is by volume; it is just over six per cent.

MS PORTER: So what is it between household and commercial? Do you have it?

Mrs O'Hara: We do not have it.

Mr Costello: I do not know off the top of my head but I can find that information for you. Subject to correction, my memory is that about 11 per cent of households take some green energy of some amount or other. It is an interesting phenomenon. We are also just trying to get some figures, which I will supply to you. At the moment you have to opt in, and of course that is encouraged by our bundle plans; as a bundle you get significant reductions on your electricity price if you include green energy and add them up with a number of other things. Before that bundle really became set, when people bought green energy, after the first bill or two a number would pull off, because it is substantially more expensive and it does hit people's pockets. I will get the churn rate for green energy for you, if that will be of some interest; that is, the number of people who have taken it up and then after getting a couple of bills have decided that that was just too expensive and they could not quite manage it. But, from 1 July, it is an opt-out provision, so that should make quite a difference.

MS PORTER: There has been a suggestion by some people that they believe that they are being punished by having to pay the additional amount. They say, "We are actually doing the right thing here by purchasing green power, but it is costing us more so therefore we are being punished for being good." They would prefer that we swapped the pricing around and that you charged a lot more for the other. I am sure it is not within your power to do that, but—

Mr Costello: If we could buy the energy on that basis, we would do so.

MR SESELJA: Maybe Mr Simes could tell us about it.

MS PORTER: There has been a suggestion that it would be really nice if you could just swap it around and charge people more for the coal-generated energy and—

Mr Costello: That is what the CPRS is designed to do exactly.

MR SESELJA: Eventually.

Mr Costello: Eventually.

MS PORTER: They feel that it is skewed the wrong way because they are doing the right thing.

Mr Costello: That is exactly what an ETS of any kind, CPRS, is designed to do—to raise the cost of black coal and brown coal energy and make green energy more competitive. But, at the moment, when you go and buy energy on the national grid, green energy costs a great deal more than other energy and it has got to be reflected in price somehow.

MR SESELJA: Given you were sort of dealing with blue sky, potential, 30 or 40 years down the track—

Mr Costello: I should not have brought that up; I am sorry.

MR SESELJA: This is less blue sky but, perhaps looking a little bit into the future, where do you see the tipping point? Given that we know that there will be a cost put on the price of carbon in one form or another, when does the tipping point come where things like solar and other renewables start to become competitive with traditional forms of energy? If you were to take a guess, would it be 10 years, would it be 20 years?

Mr Costello: Go ahead.

Mr Simes: I will have a bit of a go, then I might ask Cameron to have a go. Partly, this is a timing and also a scale issue. Within the electricity generation sector, a lot of the costings that you see suggest that with a carbon price between 40, 80 bucks or so a tonne, with the exception of maybe solar, most of the other ones become feasible. There is a question about how quickly they would then come online. The technologies are changing really quite rapidly. For example, one of the big ones that people are hoping is going to succeed in Australia is carbon capture and storage, and that has profound effects for our electricity generation industry if it does or does not work. That would be in that range too, but the technology advances needed to be solved before you do it is a timing thing. So in most of the modelling work people are assuming that that comes on stream in a serious way during the twenties, so another 10 to 20 years away, although you are getting pilots out there at the moment. Cameron might have some more specific details.

Mr O'Neill: Not much more to add. The modelling that the commonwealth undertook to underpin the CPRS policy as a reference point assumed that the next 10 years are really some wind and gas, the existing technologies, so the renewable energy target is driving up a lot of wind uptake and by necessity backup gas peaking power to back up intermittent wind. In their assumptions you had sort of larger scale renewable capacity like solar thermal, geothermal and the lower emissions coal technologies such as CCS coming in later into the period.

The reasons for those sorts of things are that it is a technical issue, so a lot of those larger technologies are not actually available yet technically. Geothermal has a lot of issues associated with it—just geological issues and engineering type issues. But the main thing is the cost, so the CPRS is thought to go some way to bridging the gap between higher emitting technologies by increasing their costs. But there is also

another argument for deployment. The costs of some of these technologies, if they actually exist, can come down quite aggressively if they are actually being used. That has been the European experience particularly: if you get things into the system, the learning by doing possibilities are quite good.

Mr Costello: That is a problem, and that is why I am such a supporter of the renewable energy target myself, because it does force new technologies to come on. But some of them will require subsidies because, if you just did it on an economic basis, wind is so much better than solar at the moment. You are just going to have to subsidise them if you are going to get people to use them—or governments can build them themselves, of course.

Mr Simes: From a commercial point of view, it is risky because, if you jump ahead a few decades, some of these are going to succeed and dominate and the other ones are going to not succeed and we should not have, in hindsight, embarked on it in the first place. So it is a very risky proposition.

Mr Costello: It is high risk. If you choose the wrong solar technology, in four years time someone may come up and make your technology look ridiculous. It is a sort of bleeding-edge stuff rather than the mainstream stuff, really.

Mr Simes: Finally, to reinforce that, as Michael said before, the investments are not four years; they are 30 or 40 years often, so there is a lot that you have lost.

THE CHAIR: I just wanted to have a look at that. Geothermal was just raised in those statements and I note that the ActewAGL submission does not refer to the use of geothermal. But it does come up in the Actew submission. It is listed as an option for the ACT for heating and cooling buildings. I guess it is hard to know at this stage, but what impact do you think that that sort of technology could have on emissions in the ACT?

Mr Sullivan: I have also read the privileges statement. I am going to ask Kirilly Dickson to speak because she is the one who has got the depth of knowledge. But just to distinguish where we are sitting at this table today from where Michael is sitting is—and it is quite unusual for us—we are a business that is going through efforts to achieve abatement of increasing greenhouse gas usage emissions out of the water industry. Between 2000 and 2008 our emissions have doubled. It is very simple why: we had a very efficient water system which used gravity an awful lot to move around water, to move around sewerage.

With climate change and drought and water security, every new measure that we come up with to achieve water security in the ACT seems to involve pumps, and other options seem to involve membranes and, again, very strong pumping of materials through membranes. So, simply, we are an industry which, in response to climate change and in response to a need for water security, is a bad player on the block in respect of emissions. In response to that, our board have said that in respect of all of our new water security projects they want us to fully abate the greenhouse gas emissions involved in both the construction and the operation of those facilities, which has put us into a spot which is beyond the debate and “let’s talk about how we are going to do it”. It has got us involved in finding and discovering abatement

measures which are economically responsible for a corporation to engage in to meet a very specified target of greenhouse gas emissions.

We have been through the process. You have seen the submissions where we have seen stuff and dismissed it, we have seen stuff and found it very, very difficult—and we continue to strive to find ways of doing it. That is where geothermal has certainly come on to our radar. It comes on to our radar and off our radar pretty quickly. You notice in our submission we basically say it is something for the government to have a look at, because it seems to be something which has high up-front capital costs. It seems to be something which we believe—and I think we suggest in the submission—you need to think of even at the land development stage, making your land development and your development on that land compatible with the use of geothermal in respect of building, heating and cooling in particular. It is not something which you can just suddenly say, “Well, let’s do it.”

Just on the general question, I was interested in the discussion. I think the ACT is in a unique position. We are a jurisdiction that has no generation to speak of. We have got a methane plant at the tip and we have got hydro—if we had water to push through it—at a very low level. Other than that, we do not have any. I guess the first question you have to ask, which is beyond greenhouse gas emissions, is: is there any reason why we should have generation in the ACT? We are a buyer of power. We have, through ActewAGL, put in place a very good market mechanism for us to be in what is a very complex market, the national energy market, and ActewAGL’s record in terms of energy purchases for the ACT is a very good one, including the movement into purchasing that part of the energy supply that comes into the ACT which is backed by renewable energy credits. In the end, all of the stuff that goes through the wires is exactly the same, and when we talk about green power it is basically green power which is backed by a certificate that says. “This is produced from renewable energy,” and we are basically purchasing that right to use that power.

You look at electricity in the ACT and you would say that until we get the second point of bulk connection to the national grid we probably do run a risk that this jurisdiction should not run and that we are dependent upon one point of contact to the national grid, so, if it went down, this jurisdiction would go down in respect of electricity usage. But that, again through ActewAGL, is being addressed.

We are becoming increasingly dependent on gas as an energy source. We cannot generate gas, or we do not think we can generate it, that there is a gas generation potential in the ACT. So you only look really at the risks in terms of its reticulation and storage, and they are probably reasonably high, in that, if the gas pipelines go down or are impaired, our level of supply is worryingly low, to how long we could survive before we had a major problem with our gas.

So you have got to look at: do we have to generate? You might reach a conclusion, and then you would say: why would we generate? Then I think it gets into the discussion that we are into, which is: does the ACT, in the ACT, wish to make an impression, a statement, take a lead, in respect of renewable energy in this country? If we do, there is only one option for us—in solar. For wind, there is not an appropriate site in the ACT.

Hydro we hope will be useful at a low level and we are certainly finding hydro is probably one of our most significant abatement prospects in respect of our own work, but it is not high-level generation. So solar is, therefore, the answer and I, like Michael, basically think that it is a very good lead if we can do it as economically as possible and if we can remove as much of the risk that we can in terms of the technology that the government finally chooses. That is why we, along with ActewAGL, are very keen on the use of solar in getting into the solar energy space.

Any generation capacity, if picked up early, will increase our own emissions. It will be a business for the operator which will have emissions, and which will therefore increase the ACT's emissions, but which in a national picture would have to be regarded as positive and leading down the line of a new technology which must be one of the futures for Australia, whether it is *Star Wars* stuff or whether it is just the use of a very broad, sunny continent to generate power.

In our submission we saw ActewAGL's submission as being excellent in terms of a broad policy coverage. We thought that, for a change, Actew, which generally says it looks at things at a higher level, is a business in this territory which, without government direction, as a board has said, "You must fully abate the increased emissions that you will create in respect of these new water security projects." I think it is very interesting the experience that Kirilly has led in basically trying to identify, because we come up with issues, we come up with capital cost issues, we come up with good ideas but non-economic ideas about how to abate.

I think the work in the ActewAGL paper on abatement curves, understanding the abatement curves and understanding where you really get dollars—a buck for your bang—is extraordinarily important and that is the thing that we strike. It is interesting that, when we first started looking seriously at greenhouse gas emission abatement, the most successful thing we did was in design of the facilities. Once you commissioned the designers in working with the contractors and the potential operator to say, "How are we going to reduce the greenhouse gas emission impact through design and construction and operation," that is clearly the most successful thing we have done. So it really is a thing which says that if you can start at the basis of infrastructure you will get your best result, and that really is about particularly the new stuff.

If we had built the dam and the pipeline without charging the designers, the operators and the constructors with the task of maximising greenhouse gas reductions, I think we would have been talking about a 25 to 30 per cent difference in the emissions coming from those projects, if we had not charged them at that stage. That is where we started.

I have got a long way from geothermal, so I will let Kirilly have something to say.

Ms Dickson: Thank you. I have also read the privileges statement. We looked at geothermal as we were aware that there were some working examples within the ACT region where it had been used—more specifically as Geoexchange, really, is the correct terminology. So we are not talking about the sort of hot rocks applications that are out in South Australia; it is more utilising the ground as a heat and cooling transfer mechanism to heat buildings in summer and cool them in winter.

Our board had a really strong desire to try and pursue abatement measures as much as possible within our own infrastructure and more particularly within the ACT region. So this one came on our radar as something about which there was not a lot of knowledge out there—there were a few demonstration facilities—but something which we thought warranted a little bit more looking at. It looks like it does have potential. It could provide significant energy savings. It is not viewed as a renewable energy source as such but rather as an energy efficiency means. There are even some private residential buildings; people are building their houses with Georexchange these days. Out in Hall I am aware of one or two. And I think that, if the government was to try and encourage development of greenfield and brownfield sites to consider this up-front, there might be the ability for it to be taken up on a bit more of a broader scale.

Some feasibilities identify 50 to 75 per cent reductions in ongoing energy usage. Probably a more practical notion would be about 25 per cent. ACT has high cooling demands in summer and high heating demands in winter, which really facilitate the use of georexchange. We are happy to provide you our studies in terms of our cost abatement analysis of it. It came up higher than our current abatement measures, which are hydro generation on our Murrumbidgee to Googong pipeline, the use of biodiesel during construction and then purchasing the remaining emissions through forestry offset, carbon sink offsets.

However, on a larger scale it might be something to assist the ACT in transforming their energy usage quite dramatically. We would be happy to assist government in any capacity that we can, but it really sort of fell beyond the normal role of our business undertakings to take it much further.

THE CHAIR: Thank you. Just looking at coal to gas, what emissions reduction could the ACT achieve by 2020 just by shifting from coal to gas and how might that look in 2030?

Mr Simes: Gas could be done anywhere within the net. It does not need to be done within the ACT. I am not sure whether your question is related to the generation or consumption?

THE CHAIR: I guess we are purchasing in that power. I guess, yes, it would be at a national level. But how does that impact? Shifting from mainly purchasing coal generated—you are talking about transitional, you are talking about these sorts of other ways that we can get to lowering our emissions. I am just trying to see: what does that look like as far as reducing emissions and what sort of time lines might we be looking at?

Mr O'Neill: Are you saying, let us say, we mandated that all our electricity purchases had to be from gas?

Mr Costello: Or renewable.

THE CHAIR: Exactly, or renewable.

Mr O'Neill: Gas or renewable, yes.

THE CHAIR: Let us just look at what that might look like.

Mr O'Neill: Sure. There is already a fair bit of gas in the electricity supply system, so for the ACT that is something that you could probably do in the system right now, given that the ACT is not a huge electricity customer in the context of Australia's energy consumption. That sort of thing is not particularly going to cause a big problem. The emissions from gas-fired generation are roughly about half those of coal and the costs are roughly about 1.2 to 1.3 those of coal, so it is not a huge cost increase. But at the moment the reason why there is not a lot of gas is that with the market left unhindered it is just cheaper to build coal; you can make more money out of it if you are generating electricity.

You are going to get a lot of this anyway in the CPRS, so that is going to drive more gas into the supply mix anyway over the next 10 years. The renewable energy target at the national level is going to drive more of the renewables anyway. Just from those commonwealth policies, you are going to get 20 per cent renewables in your electricity supply at 2020 and some increased share of gas. Modelling shows you are probably looking at about 10 per cent share of gas at the moment.

MR SESELJA: That is at a national level?

Mr O'Neill: Yes, at a national level, so that is obviously going to increase a lot more in the next 10 years.

MR SESELJA: Does that get disaggregated in terms of what you purchase here in the ACT? You would not be able to know if we purchased X per cent of gas—

Mr Costello: You know you are purchasing renewables because you have got a certificate to tell you that.

MR SESELJA: Or non-renewables?

Mr Costello: But you do not know what you are purchasing. When AGL buy in the market, they bid into the system. Every five minutes a price is displayed. At the end of that period, after half an hour, the clearing price is set. You buy at that price, whatever it is. I do not think you can—correct me if I am wrong—go and say, “I only want to buy gas.”

Mr O'Neill: You could with a specific contract.

Mr Costello: You could go to a particular generator and buy from that generator, yes, you could.

Mr O'Neill: But it does not mean that that physical electricity unit—

Mr Costello: That physical would not come to you; you would go and buy from them.

MS PORTER: That is the same as the green power when you do not have a—

Mr Costello: Yes, a particular—what is it; an electron or something?

MS PORTER: You do not have a power line running into your house that just has green power coming through it.

Mr Costello: You could buy that power from that generator. You can do a forward contract for three or four years to buy power from that generator, but when it comes off the grid you do not know it has come from that generator; it is just part of the mix.

MR SESELJA: But in the end it has the same effect.

Mr Costello: It does—exactly the same effect. It is just the same as when you buy your renewables you do not know where the power that you get off the grid is generated from. So that is the way you would do it, rather than on the market.

Mr Simes: Coming back to the original question, the motivation for that question, it seems to me, is: is there a way that could bring forward gas, over and above what will happen in any case within the CPRS? As Cameron said, as we put a price on carbon, that is going to be where a lot of the earlier action is going to happen anyway and, theoretically, I think you could push that harder but already you have got fairly substantial adjustment costs. We are going to have coal-fired generation close down over the next 10, 20 years and the question is how that is done. I think that is the biggest public policy issue in the country, rather than can we bring it on a bit further and faster.

Mrs O'Hara: We also did include in our submission the results of some ACIL Tasman modelling. They looked at the amount of black and brown coal-fired stations that you would have to retire to achieve reductions of 10 per cent and 20 per cent, and in the case of a 20 per cent reduction, for instance, you are looking at retiring over 10,000 megawatts of fossil fuels. You replace that then with about 16,500 megawatts of renewables and, of that 16,000 megawatts, about 9,500 would be gas and then you would top it up with solar and wind, predominantly wind.

Mr Costello: A lot of that would be peaking power, gas-fired peaking power supply, rather than base loaded. What we are talking about here is a peaking power supply. We have not answered your question—and I realise that—and what we will do is go away and do the modelling to answer your question. If we were to have a combination of 20 per cent renewables and 80 per cent that we had forepurchased from specific gas-fired generators, base load generators—they would have to base load, most of them—what would be the price in the mix? We will get that information to you and pass it on.

Mr O'Neill: Queensland actually have a scheme in place that mandates a certain amount of gas in electricity supply, 13 per cent, and they have had that going for a few years. That has supported a lot of new gas-fired power in that state, but that was targeted to get more gas-fired power stations built in Queensland.

MR SESELJA: Well, that will probably give a bit of an indication in terms of how that can be done, I suppose.

Just roughly, and I apologise if it is in some of the detail in the submission, what is, roughly, the difference in omissions between gas and brown or black coal?

Mr O'Neill: About 50 per cent for black coal.

Mrs O'Hara: It is a third for brown coal and 50 for black.

MR SESELJA: And the cost differential at the moment between gas and coal?

Mr O'Neill: Twenty or 30 per cent more for gas.

Mr Costello: It depends. As I say, a lot of gas is sold, particularly the open cycle one. It is sold not as base load but on the peaking power market, which by definition is always when suddenly demand peaks. The open cycle can come on stream within 20 minutes to meet a sudden spike in demand. A closed system would be a couple of hours; that is, a combined cycle system would take a couple of hours to come on. I have just been up to Mount Beauty with Dianne and Mark. AGL are building a new hydro system up there—the most amazing thing. It was a wonderful day. They will be able to turn theirs on and off within 30 seconds.

MR SESELJA: Do we get much from hydro at the moment?

Mr Costello: As part of the renewable energy, but how much is hydro and how much is wind we do not know.

MR SESELJA: Is hydro contributing much across the nation at the moment?

Mr Costello: It is peaking mostly, too.

Mr O'Neill: The hydro is a funny thing. It is hard to understand. It is mainly used as an insurance against electricity prices going too high so, if a generator shuts down, the Snowy hydro might be contracted to turn their power stations on to keep electricity prices down for large energy users. I think it is about 5,000 gigawatt hours a year, roughly.

THE CHAIR: With this trip, was there some new technology, just going to back to the discussion you raised, Mr Sullivan, around that we have a small amount of sort of hydro generation going on in the ACT?

Mr Costello: This is a big one.

THE CHAIR: This is a big one but is it newer technology that might be able to boost what we are producing at the moment or there is no connect?

Mr Sullivan: The purpose of the trip for me was really to see a very large piece of capital works getting towards its conclusion and some very useful discussions at the project management level, particularly around a project which had a lot of challenge. It is in a national park and so you see the proponent having to make decisions like the purchase of a large tunnelling machine from Germany, which built the 6.9-kilometre

tunnel, but they could not let the tunnelling machine emerge into the national park so they had to dig a hole inside the tunnel, drop the tunnelling machine in it and seal it. It has done its last tunnelling job because it cannot emerge because the tunnel, basically, goes from the existing power station. It is basically up at Falls Creek. The water starts at Falls Creek. There is an existing power station called McKay Creek power station. It discharged into a Pretty Valley creek, which is part of the Kiewa River system.

You saw there what the discharge of a large hydro plant can do to a creek. When that hydro works, and it only works 80 per cent of the time, the pressure of the water going into that creek is just enormous. They have used a number of drop holes and tunnels to transfer the water without going into the creek, which returns the creek to natural flow, which is positive, down to a new power station at Bogong. So in the end they will have this water being used four times before it actually then enters the Murray-Darling Basin waters.

What I got out of it I did not expect. I got a small understanding of the national electricity market, which you really do need to understand. It makes the stock exchange look like a very simple piece of business I found, the national energy market and how it operates and what its risks and that are. But it was mostly for me around project management of very large projects, given what we are about to engage in up on Cotter. There we saw a lot of good new technology but no, not for the ACT in respect of interesting new technologies.

The generators, I understand, are very state of the art. They work on a different water catcher mechanism than traditional generators. They must be fully submerged in water to operate. The new power station is fully underground. It is a very interesting thing to see—a very large renewable energy project in a pristine environment and which has everyone happy.

THE CHAIR: Thank you. When we are talking about energy security for the ACT, what is the best place that we can be in; is it to have a decentralised energy or localised energy production?

Mr Costello: When we get the second point of supply for our electricity grid, which should happen reasonably soon—it is out at Williamsdale, just a substation there; that is where TransGrid will bring its electricity into Canberra—we will have two. We were extremely vulnerable before.

At the moment we rely on our gas supply, on two pipelines, from two separate places—and that is an advantage—and our gas pipeline system can more than cope with the maximum demand, the one we own, ActewAGL, but these pipelines supply us with a gas. Something can go wrong in Bass Strait or in Moomba or somewhere and there will be a fire or there will be something wrong with a pipeline and suddenly—three winters in a row we have been put under pressure—we have had to close down, turn off a couple of industries for a couple of days, mostly outside the ACT, which has caused terrible angst to us but it is not under our control.

We are looking at now finding a way to increase our gas security. Whether or not you have disaggregated distributed power supply—say you have distributed gas, which is a fantastic thing to do if it is on a big enough scale, as it was on the CTC, not for

generation but for that particular building; it made sense because they were prepared to enter a 20-year contract to buy it—you still have to get the gas there and you have to get it through the pipeline and it has to come through our distribution system to come to that place. There has to be gas in the first place so the key question is: is the gas supply to the ACT, within the ACT, the trunk system, reliable, with the proper capacity? Absolutely—more than enough capacity, more than enough reliability. Is the supply to the ACT reliable? Not at the moment. So we are going to have to look at ways where we can, ourselves, control some sort of storage capability.

Electricity generation on site: I am not quite sure how you would do that other than solar. Solar power generation on individual houses is extremely capital intensive. I think we are looking at \$30 to \$40 a tonne for the carbon price. To do it on the residential at this price is about \$500 a tonne.

THE CHAIR: Understanding that the more people who are going to get into that market the more the production costs will come down, so it is about economies of scale?

Mr Costello: No, not so much, because it is house by house. If you build it on a big scale and a single big plan, like everything else, yes, that is correct. But, because it is house by house, individual design for each house, individuals have to go out and plan it. One of the things that worries me about it is how many people are going to fall off their roof— because you have to clean it pretty regularly to make it efficient. And, of course, one of the disadvantages, as you know, is that the cost of that is borne by the whole community, even people who do not get the benefit of it, people who do not have it on their roof. It flows through into the electricity price for everybody in the community. So people who are on lower incomes are paying people on medium to high incomes for this, even though 15 per cent of their costs tend to go on energy as distinct from those on higher incomes where five per cent of their costs go on energy.

THE CHAIR: That has been identified, and I guess another argument that we have read in one of the submissions is that people across the community are also paying for other people's air conditioners that are peaking during those hot summer afternoons. An interesting argument put forward in one submission was that not everyone has an air conditioner but that the cost is spread around through the system too. What would you say to that?

Mr Costello: What I would say is that people who buy power for their air conditioners buy it off the grid at the same price as everybody else. If solar power was available from a utility of the kind, as I understand, all parties here are supporting—that we have a solar power station—it will be fed into the grid and it will be available at the same price to everybody else. The disadvantage of having it on each individual roof is that those people get a benefit from it and others pay a price for it.

The system is in and we are supporting it and we are being extremely active in making it happen. There may well be a case to have it on a larger scale, distributed, on a big shopping centre, and that would be on a sufficiently large scale to make more sense. We are looking at some numbers on that now to see if we could be a player in that.

MR SESELJA: Just on some of those numbers, I wanted to get you to elaborate on the \$500 per tonne you talked about for some of these. In what sense is it \$500 per tonne? Is that for every—

Mr Costello: To save a tonne. It costs you \$500 to save a tonne of greenhouse gas emissions.

MR SESELJA: So, if you look at it compared to a CPRS or an ETS you are looking at \$30 to \$40 a tonne as a carbon price potentially, but here you are subsidising it at \$500 a tonne.

Mr O'Neill: Yes, 50c a kilowatt hour, and let us say you displace one kilowatt hour of coal-fired electricity— so in megawatt hours that would be one tonne of CO₂— you are footing a hefty bill.

MR SESELJA: In rough terms, the scheme as it currently is, applying to households, how much is that contributing to our use of renewable energy?

Mr O'Neill: The solar feed-in tariff or the—

MR SESELJA: The solar feed-in, yes?

Mr O'Neill: As far as I understand it, it has just started. I would have to look at it. The thing that has been driving—

MR SESELJA: We know what the take-up is in the first year or something. I can find out that way—

Mr Costello: No, it has only been going for a short while, only a few months.

MR SESELJA: Okay, but on the projections I think we were told something like 1,000 homes. What will that contribute to our overall renewable energy use?

Mrs O'Hara: It depends on who has the RECS too. With a lot of these solar installations, the PV installations, the householder will not get the RECS, the RECS are retained by the manufacturer, who then sells them.

Mr Costello: So it is not actually green, unfortunately.

THE CHAIR: Could you say that again?

Mrs O'Hara: With some of these PV systems, when you buy them the cost is lowered but the seller or the manufacturer retains the renewable energy certificates that attach to that system.

Mr Costello: And gives you the \$700 or \$800 discount for doing that and then onells them for someone else to produce black coal or brown coal.

Mr O'Neill: I would have to crunch some numbers.

MR SESELJA: Yes. It would just be interesting to know because obviously that is one of the debates going forward. Mr Costello has identified it as when we move to renewables what is the most efficient way. As you have said, in terms of some of the larger generation, that is when you get your efficiency. I would be interested in some of those numbers if that is possible.

Mr Costello: Do not get me wrong. I am not speaking against it; I am just trying to point out the relevant advantages of different technologies and different ways of doing it. We are completely cooperating and supporting the installation of these things and retail. We have done everything we possibly can and we will continue to do that.

THE CHAIR: Can we just look at the renewable energy target issue. The ACT had a mandated renewable energy target that was higher than the federal 20 per cent by 2020. Would this be one way to share the extra costs across the community, and could a higher renewable energy target in the ACT interface easily with the national scheme?

Mr Costello: If the federal one was 20 per cent and ours was 45 per cent, it would not be effective in reducing greenhouse gas emissions because people would move. If it was 25 per cent—and I would not know the sensitivity analysis on this—it may not be enough to do that, but I would like someone else to speak to that.

MR SESELJA: Are you talking emissions reductions or renewable energy targets?

Mr Costello: RETS. I am sorry. I apologise. I misunderstood you.

MR SESELJA: But I would like to get onto that one as well if we could.

Mr Simes: Just on the feasibility, I cannot see any reason why it is not totally feasible to have a different target, still within the one scheme, but that does not mean that instead of 20 per cent you could not require consumers or users within the ACT to have 25 per cent or 30 per cent of their electricity consumption matched by the RETS. You just use the same scheme.

On the general question, if we have got a five per cent reduction target, or 15 or 25 or whatever it is, of a nation, and you do a bit more in the ACT, whether through RETS or through anything else, we have still got the five per cent target, and so that means that, for example, that lowers the electricity price for others. It does not mean that we have changed the national; we have not increased the national reduction in emissions beyond that five per cent. Even before Michael's point about businesses moving, there is a direct offset elsewhere in the system. Sorry, I am not being very clear there. If what it meant was that through whatever means there was less electricity being used in the ACT—just to make it simple—and the only form of emissions was through electricity and we had that five per cent target, in effect to meet that five per cent target the price of carbon or emissions would be lower elsewhere, and people will be generating more emissions elsewhere in the system.

The binding thing there is the five per cent target, and doing more or less in the ACT is just going to mean that the ACT does a bit more than elsewhere. If you then make the RETS, your targets, a lot higher, that incentive becomes really very strong and so

the price of electricity in the ACT is starting to affect business decisions or where households live—more people live in Queanbeyan at the margin rather than the ACT. Then you have these second-round effects also.

But it is feasible to do and the same logic applies with solar panels on houses or whatever. If you compare which is more efficient or cost effective to achieve the same overall outcome, you would do the renewable energy targets well ahead of the solar panels.

MR SESELJA: Mr Costello, just following on from that: I think Mr Simes has been touching on a little bit of both the emissions reduction and the renewable energy target, but the position seems to be broadly in the submission that the national scheme is by far the most important in terms of how all that works. You seem to have been expressing a view that, if we are a little bit ahead of that, that is not a bad thing; we probably will not see necessarily economic activity moving over the border, but there is a tipping point if you are too far ahead.

Mr Costello: That is right, and that is the second-round effect. But I think what Ric was talking about were the first-round effects. To the extent that we are even a little bit above, it just makes it possible for somebody else, if it is a lower target, to have a cheaper price, and whether it will have any impact. So I guess that is right. I am expressing a viewpoint here: somebody has got to show the way, and somebody has got to pull the system along, and us being a little bit ahead I think would have that benefit. It is going to put pressure on others to join in and follow, I would have thought.

I have more doubts about whether that would be the case internationally with that argument, but, within our own national political system, the more the push forward the more others are going to be under pressure to follow. So I think it has that advantage, a leadership advantage.

Mr Simes: I agree with that and, as I said earlier, the biggest challenges here are not so much the design of the ultimate scheme; it is more the transition arrangements and anything that can be done to push it ahead I think helps.

Mr Costello: That is why I like the solar so much. If we can get solar, make the ACT the solar capital of Australia one way or another, in an effective way show others that this is economically the most sensible way to go, this is the cheapest, the most bang for the buck, then the better. That is why I am arguing so strongly for a solar utility system, solar public utility. But that is going to be a competitive thing. If there is one there may be more. I am expressing a hope here that it is a bit open ended, certainly the expression of interest, about how big it might be, because the bigger it is the more cost effective it is, and that is the heart of a lot of what we are arguing here. We have got to show that this can be done at a lesser cost than perhaps people thought. That is my argument.

THE CHAIR: Earlier in your presentation you touched on the peaking power station. Could you just give a little bit more detail about Actew's plans for a gas-fired power station in the ACT? I have a couple of questions around that: what is the difference between a peaking and a base load power station? If you were building a peaking

station, could it be converted to a base load station? And what is the life span of an installation like that?

Mr Costello: I can speak to it and then I will ask Di to join in. We are only looking at a peaking power plan, not a base load system, because that is what works for us and our partner AGL in the system. From their point of view—and we could only do it with them, and they may even do it themselves, with us providing support; we have not quite worked that out yet—they would want it to fit into their package, their portfolio of renewable energies. From their point of view, what they are looking at is a peaking power plant—of between 350 and 400 megawatts is what I think they have in mind—that runs between eight per cent of the time, 15 per cent of the time, more normally towards the lower end.

What it does is fill the gaps in the peak periods, which is very important to us here, obviously, where we do have big peaks, particularly during summer. Even leaving aside air conditioning, we do have big peaks in this city, just as we have a huge peak in winter with gas. So we are looking at that. Is it easily convertible? A base load power plant is a combined cycle one, and that is a different technology from an open cycle which can cycle up very fast.

So, first of all, there is the technology issue, and the second issue, of course, is that you would only get approval for a particular type of plant; you would not get approval for a different type of plant, and all your environmental analysis on emissions and everything else would be based on a certain level of usage. If you wanted to do something different, you would have to go back and start all over again, leaving aside the technology barrier.

On the question of duration of such a plant, yes, you would be looking at 30 to 40 years; that is the sort of time scale that these investments are made of. They are not small investments; they are many hundreds of millions of dollars. You would be looking to get your return over that protracted period. I was talking to one of your colleagues about that that is an issue that I think is going to be serious throughout, not just here but everywhere, in discussing this.

Gas is an essential inescapable transitional fuel, but I think the transition you and others have in mind is 15 or 20 years, not 20 to 40 years, so what happens between that period? Are you saying they have to be taken out after 20 years, having provided their transitional role? Then the cost of the energy they provide over that 20 years is going to be a great deal higher to get the return before someone will invest in it. I hope that goes some way towards answering your question.

Mrs O'Hara: If I could just very quickly add there, again in terms of the conversion of a peaker to a base load, I asked that specific question when we were down with AGL the other day, and the answer was no; you build one or the other.

Mr Costello: They are different, very different; one is a turbine, one is gas, heats steam and so on.

Mrs O'Hara: He knew of no examples where you built a peaker and then sort of made it into a base load, so I think they are quite specific entities.

Mr Costello: I should say that we are perfectly relaxed about waiting for the outcome of this energy, obviously, if we have to, but we are also relaxed about waiting for the outcome of this energy inquiry—I think there is some discussion that it might be completed by the end of this year—for an energy plan for the ACT, and we hope to be able to anticipate and give evidence to that. If, at the end of that, the ACT Assembly says there will be no gas-fired power plants in the ACT, well, there will not be. That will be that. But, if there is, we hope to argue the case—on the grounds that we have just been making here—that that is the way to make a contribution, nationally, to the transitional period over the next 20 years, not just for the ACT.

MR SESELJA: You said earlier, Mr Costello, in your address that you believe offsets are particularly underdeveloped. Where do you see some of the particular potential, particularly in the ACT or for ActewAGL, in terms of buying these offsets?

THE CHAIR: Could I just add to that, around offsets: what offsets do you see as being acceptable as well? There can be some problems if you are talking about offsets offshore in developing countries.

Mr Costello: I think the people who will be able to add to that particularly are, if I may say, Kirilly, but I will just make a general observation. One of the problems about offsets is exactly the one you have identified: what is regarded as a legitimate offset and what has been mandated under the international system or what has been mandated by the federal system? That is one of the trickiest things that you find in trying to get into this area.

We, ActewAGL, are very interested in examining further some of the ideas about soil carbon sequestration and some of the work that CSIRO have done. It is commonly referred to by the shorthand name of the char option. The science on that for the CSIRO is quite compelling. The problem comes back to the one that I think you are indicating and that is: how do you measure the results? How do you know you have actually got a certain level sequestration? I think a lot of experiments are going on now to try and do that measurement so that it can be credible and certified, and we are going to participate, we hope, with some people who are interested in this, in some research into this. If Mr Sullivan is kind enough, we hope to use some of the land that Actew has acquired at Williamsdale to do some of that work. But, more generally, the whole question of offsets is indeed a vexed one.

Mr Sullivan: We have certainly looked at it and we have set criteria to Kirilly and the advisers on offsets. One is an economic criterion; we are looking for offsets at a cost of \$40 per tonne for CO₂. If we can find them at or below that price, we will seriously look at them. We want it to be diversified. We do not want to have a single offset where all of our eggs are in that one offset.

Michael said that we are saying that for an offset to be accepted by us it must be real, it must be measurable, it must be permanent, it must be additional and we will require independent verification that it has achieved the offset. We have an aim to develop offsets within the ACT region. We have a rule, which is that we will not accept foreign offsets at this time; we will not go offshore for offsets. So, if we cannot find them in the ACT region, we will find them in Australia, because again I think that,

while some of the offshore offset opportunities are real and measurable, we have to worry about the independently verifiable and permanent criteria. At the moment, the direction to Kirilly and her people in terms of searching for offsets is that, no, we will not go offshore with offsets.

We have within the ACT, clearly, hydro. Small-level hydro is emerging, particularly where it is project specific. Our single largest offset program—I think it will meet its business case—will be a mini-hydro within the Murrumbidgee to Googong pipeline itself, which will directly then feed the pumps that push the pipeline, and that will achieve a very good level of energy offset from that project.

Certainly trees and carbon sinks, including the use of our own land: we will be required, one, to have some compensatory plantings in respect of some of the work we are doing at Cotter and possibly in the Murrumbidgee to Googong pipeline, so we need an area to be basically able to compensate in terms of growth, as well as potentially use some of the contractors that we were talking about. We are very close to signing those contracts in respect of carbon sinks and forestry operations, including contracts with organisations like—I do not think this is commercial-in-confidence—Greening Australia, to basically look where we have got land and be able to operate and provide the offsets ourselves.

We had some very promising things which, in the end, make it hard for a corporation. We were very keen on working with ACT Recycling over wood. We cannot make that work, but we think that it is close enough that we should be talking with the ACT government about talking with the commonwealth because it is new technology. There is very little example. It has multiple positives about it. It reduces landfill. It does require the undoing of some commercial arrangements about where and how wood waste is dealt with in the ACT. Some of it is shipped off in other contracts. It really would require the concentration of wood waste, probably at a site, but at the moment the project has a small but considerable enough net negative benefit to us as a business. But we certainly want to share the experience of that with the ACT in terms of whether there is opportunity to progress it as an initiative. We think it is one that is worth while for the ACT in terms of its capacity to reduce landfill and use the wood waste. I know ACT Recycling are very keen.

The other one which we have is biofuels. Again we have set some criteria around biofuels. We do not want biofuels from food stock. We would want biofuels from waste product rather than food stock. It seems to us to be straightforward. It seems to us that the supply is there. Again, undoing some commercial arrangements is very difficult. Some of the very large engineering firms have tied contractual arrangements with fuel providers and that is a challenge. But that is a challenge that Kirilly's going to overcome—before the child. We think that one is a really simple one, particularly if we just put a couple of criteria around it. We like the idea of a criterion that says we will not use food stock biodiesel; we want to use waste product biodiesel.

In the end, the three that are really running are hydro, biofuels and forestry carbon sinks. In the submission we have gone through the waste wood generation, which is something I will be writing to chief ministers and others about saying, “I think we should try and see if there is a way where we can bridge this business case for us because we think there are some positives there for the ACT, particularly if we use

gasification.” We could use an old process but I do not think we want a lot of emissions coming out of Mugga Lane tip from old-process wood treatment, which is basically like an old steam train.

But the new gasification processes are certainly extraordinarily efficient and have very little by-product in terms of any emissions or anything like that. Each one we are excited about. Things like geothermal we think the territory should have a good look at. But, in the end, the biggest single one for us was good design, good energy-efficient design around when you start. It makes you the easy dollars and the easy savings, although sometimes it is a bit harder to measure and claim them, to say, “Look, we built this thing; it could have been much worse but it is not.” It means that the task of offsetting is easier. So you do get a measure. I do not know whether Kirilly will add anything.

Ms Dickson: Just in relation to the carbon forestry offsets and the process we have been through, I think the three biggest issues that struck us in trying to select providers in that field were proving permanency, which is largely part of the reason why we went nationally instead of offshore. These things have to be around for 30 years to be beneficial in real terms, so being able to prove that and have a hand on heart when we proceed with these contract negotiations, that we are going to withhold that obligation, has been somewhat difficult with some of the providers and the way they put forward their terms and conditions.

The other area is in “additionality”, which Mark has mentioned. Being able to prove that these things would not have gone ahead anyway as a business as usual is something that we have looked very seriously at in terms of proceeding with those contract negotiations. One other aspect which struck me through the process in terms of getting the providers—and I would like to say that, out of the 12 providers we found out in the country which were able to be verified under a national or state system, we had eight put forward tenders, so we have got quite a good proposal rate—was the area of measurements. They all seem to have different measurement methodologies which underpin how they estimate these carbon sinks are going to provide offsets. Some of them were a little bit dubious in terms of: you plant these trees and straightaway they provide all these carbon benefits. Others showed increasing scales to ethereal proportions over time, which were doubtful as well. So there seemed to be a lack of consistency in terms of national protocols around those measurement methodologies.

The other aspect which struck me was that some of them actually include in their offset measurements soil carbon already, even though from my understanding of national policies it is not quite an accepted form of offset at this stage. So there are a lot of inconsistencies. Out of the eight proposals I do not think any one of them was the same as any other. So rafting through those differences and trying to come up with a firm basis to move forward was a challenge. Again we used our portfolio approach to make sure that going forward we would address those risks in the best way we could.

THE CHAIR: Ms Dickson, are you aware of any work that is going on at the federal level, or state-based work, that is trying to grapple with this issue to try and get some consistency and some standards?

Ms Dickson: I am not sure about the methodology. The best form of documentation out there is the national carbon offset standard, which is part of the CPRS. That does have within it some issues which off the top of my head I cannot recall, to be honest. But we have put forward some issues, through our minister, to take up in terms of the voluntary aspects with offsets and ensuring that there is some consistency and equal recognition with offsets and permits within the federal CPRS system.

THE CHAIR: I would like to thank you all very much for coming along today and appearing before this committee. I do look forward to receiving the Geoexchange documents that we discussed earlier; that would be very useful information. Transcripts of today's hearing will be coming out to you for you to have a look at and get any corrections back to the secretary—not to change your whole statements, obviously.

The committee adjourned at 11.12 am.