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SENATE

SELECT COMMITTEE ON FUEL AND ENERGY

Reference: Issues relating to the Fuel and Energy Industry

MONDAY, 29 MARCH 2010

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SENATE SELECT COMMITTEE ON

FUEL AND ENERGY

Monday, 29 March 2010

Members: Senator Cormann *(Chair)*, Senator Hutchins *(Deputy Chair)*, Senators Bushby, Fifield, Ian Macdonald and McEwen

Senators in attendance: Senators Bushby, Cormann, Hutchins, McEwen and Xenophon

Participating members: Senators Abetz, Adams, Back, Barnett, Bernardi, Bilyk, Birmingham, Bishop, Boswell, Boyce, Brandis, Carol Brown, Cameron, Cash, Colbeck, Jacinta Collins, Coonan, Crossin, Eggleston, Farrell, Feeney, Ferguson, Fielding, Fisher, Forshaw, Furner, Heffernan, Humphries, Hurley, Johnston, Joyce, Kroger, Lundy, Ian Macdonald, McGauran, McLucas, Marshall, Mason, Milne, Minchin, Moore, Nash, O'Brien, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Stephens, Sterle, Troeth, Trood, Williams, Wortley and Xenophon

Terms of reference for the inquiry:

To inquire into and report on:

a. the impact of higher petroleum, diesel and gas prices on:
   - i. families,
   - ii. small business,
   - iii. rural and regional Australia,
   - iv. grocery prices, and
   - v. key industries, including but not limited to tourism and transport;

b. the role and activities of the Petrol Commissioner, including whether the Petrol Commissioner reduces the price of petroleum;

c. the operation of the domestic petroleum, diesel and gas markets, including the fostering of maximum competition and provision of consumer information;

d. the impact of an emissions trading scheme on the fuel and energy industry, including but not limited to:
   - i. prices,
   - ii. employment in the fuel and energy industries, and any related adverse impacts on regional centres reliant on these industries,
   - iii. domestic energy supply, and
   - iv. future investment in fuel and energy infrastructure;

e. the existing set of state government regulatory powers as they relate to petroleum, diesel and gas products;

f. taxation arrangements on petroleum, diesel and gas products including:
   - i. Commonwealth excise,
   - ii. the goods and services tax, and
   - iii. new state and federal taxes;

g. the role of alternative fuels to petroleum and diesel, including but not limited to: LPG, LNG, CNG, gas to liquids, coal to liquids, electricity and bio-fuels such as, but not limited to, ethanol;

h. the domestic oil/gas exploration and refinement industry, with particular reference to:
   - i. the impact of Commonwealth, state and local government regulations on this industry,
   - ii. increasing domestic oil/gas exploration and refinement activities, with a view to reducing Australia's reliance on imported oil, and
   - iii. other tax incentives; and

i. the impact of higher petroleum, diesel and gas prices on public transport systems, including the adequacy of public transport infrastructure and record of public transport investment by state governments.

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Committee met at 8.48 am

CHAIR (Senator Cormann)—I declare open this public hearing of the Senate Select Committee on Fuel and Energy. The Senate has referred to the committee matters associated with fuel and energy, including the price of fuel, regulation and taxation arrangements, and alternative fuels. The committee is due to provide its final report to the Senate on 30 June 2010. Today the committee is focusing on energy and fuel security, in particular to the terms of reference relating to the existing set of federal and state government regulatory powers as they relate to fuel and energy products, taxation arrangements on fuel and energy products, the role of alternative sources of energy to coal and alternative fuels to petroleum and diesel, and domestic energy supply and the domestic oil gas exploration and refinement industry.

I welcome you here today. This is a public hearing and a Hansard transcript of the proceedings is being made. Before the committee starts taking evidence, I remind all witnesses that in giving evidence to the committee they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of giving evidence to a committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee.

The committee prefers all evidence to be given in public but under the Senate's resolution witnesses have the right to request to be heard in private session. It is important that witnesses give the committee notice if they intend to ask to give evidence in camera. If a witness objects to answering a question, the witness should state the ground upon which the objection is taken, and the committee will determine whether it will insist on an answer having regard to the ground which is claimed. If the committee determines to insist on an answer, a witness may request that the answer be given in camera. Such a request may of course also be made at any other time.

I would also ask witnesses to remain behind for a few minutes at the conclusion of the evidence in case the Hansard staff need to clarify any terms of reference. I remind people in the hearing room to ensure that their mobile phones are either turned off or switched to silent. Finally, on behalf of the committee, I would like to thank all those who have made submissions and sent representatives here today for their cooperation in this inquiry. Welcome.

[8.50 am]

McNAMARA, Ms Sarah, Head of Government Affairs, AGL Energy

NELSON, Mr Tim, Head of Carbon and Sustainability, AGL Energy

Evidence was taken via teleconference—

CHAIR—Welcome. I invite you to make a brief opening statement and then the committee will ask some questions.

Mr Nelson—Thank you, Chair. I will start off by describing who AGL is. AGL is Australia's leading integrated renewable energy company with 3.2 million customer accounts. Drawing on over 170 years of experience, AGL operates retail and merchant energy businesses, power generation assets and an upstream gas portfolio. AGL has Australia's largest retail energy and dual fuel customer base. AGL has a diverse power generation portfolio including base, peaking and intermediate generation plants, spread across traditional thermal generation as well as renewable sources including hydro, wind, landfill gas and biomass. AGL is Australia's largest private owner and operator of renewable energy assets and is looking to further expand this position by exploring a suite of low emission and renewable energy generation development opportunities.

In assessing the impacts on households, AGL believes that price assessments only provide part of the story. The impact on households of changes in electricity and gas markets should be determined by examining the total electricity or gas bill. Increases in prices accompanied by reductions in consumption can leave the household no better or worse off. In this context, it is worth noting that average household consumption has remained relatively static over the past few years.

CHAIR—You are going in and out a bit. Hello?

Mr Nelson—Sorry, Chair. We are also getting quite a lot of feedback.

CHAIR—I am looking at our technicians to see whether there is anything. Can you hear us?

Mr Nelson—Yes, we can hear you. Can you hear us?

CHAIR—Yes. It is very, very distant, but yes. Keep going.

Mr Nelson—With that in mind, I will cover off three principle policy issues in relation to the terms of reference. The first of those is price regulation. A key barrier to the efficient supply of energy is the continual lagging of reform with respect to jurisdictional intervention and in most cases regulation of retail prices. In an environment where the wholesale market largely operates without exogenous controls on pricing, AGL believes that full deregulation of energy price controls should be pursued immediately.

The second issue I would like to touch on is energy efficiency: AGL believes that a national energy efficiency scheme should be developed by the Commonwealth government. AGL is a proactive supporter of energy efficiency and participates comprehensively in the three existing state-based energy efficiency certificate schemes. AGL encourages an initiative to harmonise the Victorian, New South Wales and South Australian schemes, together with the inclusion of other jurisdictions as appropriate. This would deliver considerable benefits in assisting consumers adjust to carbon-inclusive electricity prices and reduce the emerging energy efficiency compliance burden on the energy supply sector.

CHAIR—Sorry, but you are totally fading out, Mr Nelson.

Mr Nelson—Chair, would it be worth trying to call us back? Maybe it is just a bad line.

CHAIR—We will try that. Also, rather than speaking on speakerphone, maybe you could pick up the receiver and see whether that improves things.

Mr Nelson—I will try that.

CHAIR—We will pick up where we had to leave off.

Senator HUTCHINS—Mr Nelson, you were making three points: price regulation, energy efficiency—

Mr Nelson—I will very quickly cover them off again. The first point was essentially deregulation of electricity and gas pricing. The second point was that we are very supportive of a national energy efficiency scheme which essentially harmonising the existing three state-based schemes.

The third point was around customer focused assistance. We are saying that assistance should be provided in the form which reflects the intent of the assistance—for example, payment could be made by government to energy retailers with rebates provided directly on energy bills rather than to the customer directly. That way it addresses the actual policy issue trying to be overcome, which is hardship amongst vulnerable customers. That is the end of our opening statement.

CHAIR—Thank you very much, Mr Nelson. You mentioned how you are an integrated renewable energy company. Would you perhaps touch on the question of what you think will be the full potential of renewables to contribute to our energy security moving forward?

Mr Nelson—I think that Australia is blessed with significant reserves of both fossil fuel and renewable energy. Our solar radiation is amongst the best in the world. Our wind sites where we have good wind speeds are the envy of the rest of the world. We have got many sites throughout Australia which are in reasonable proximity of the transmission system where wind speeds are in excess of eight metres a second. That is very significant in global terms, so longer term we think that the 20 per cent renewable energy target is achievable. The amendments that have been suggested and put forward by the government on 26 February will probably mean that you will see in excess of 20 per cent of energy coming from renewable sources by 2020. Again, we think that is very much achievable.

In terms of fuel security, Australia is a very fuel secure nation. We have significant reserves of coal, significant reserves of gas and significant opportunities for renewable development. Depending upon which policy settings are in place, we do not see Australia as having any issues in relation to fuel security any time soon.

CHAIR—In that context, what would be your position on the question of nuclear energy?

Mr Nelson—We do not really have a position on nuclear. Nuclear power is something which has developed to provide significant baseload energy supply. The national electricity market at the moment is characterised by growth in energy demand being experienced mainly in peak demand. Nuclear is not really a technology which is suited towards providing peak power because it has got very high capital costs and relatively low operating costs. It is the type of technology which you switch on and leave on; you do not turn on and off. We have not developed a nuclear position simply because we do not see it as a necessary technology in the short to medium term for market purposes.

CHAIR—To summarise: you are saying that we can continue to meet our baseload demand through coal and gas, and the renewable energy sources will be able to help us provide up to 20 per cent of our energy demand but essentially be able to deal with periods of peak demand.

Mr Nelson—Yes, that is right. We would see over the next 10 years for instance the majority of new energy coming from renewables to satisfy the renewable energy targets with firm capacity being provided by the development of new gas-fired peaking power stations. To the extent that policy is set in a way which requires significant greenhouse gas emission reductions in addition to renewables, we would expect to see new combined types of gas technology being deployed to substitute for coal technology to reduce Australia's domestic emissions.

CHAIR—We have got the renewable energy target. Some witnesses have put to us that rather than a renewable energy target or perhaps on top of it we would need a low-emission technology target. Some low-emission technologies might not necessarily be renewable—for example, gas or dare I say nuclear. Have you got a view on that?

Mr Nelson—We have consistently said that we think a broad economy-wide emissions trading scheme, a renewable energy target and an energy efficiency scheme are the three principal policies that you would want to see developed. A low-emission technology target—a LRET or some form of scheme like that—we would see almost like a baseline and credit style emissions trading scheme. Our view has always been that, if you are going to go down the path of trying to drive technology development, the best way of doing that is through a renewable energy target and, if you are going to try to achieve emissions reductions, the best way of doing that is with a cap-and-trade emissions trading scheme.

CHAIR—In relation to energy efficiency, you were calling for a national energy efficiency approach. What is that we should be doing that we are not doing, other than pulling it all together into a strategic framework?

Mr Nelson—There are state-based schemes at the moment which essentially provide credit for households that take initiatives to reduce their energy consumption in an efficient way—a good example being the Victorian energy efficiency trading scheme, whereby things such as

removal of higher energy consuming appliances and the installation of new, more energy efficient appliances means that that household then creates an energy efficiency certificate. That energy efficiency certificate is then sold to a retailer and then that retailer has to surrender it on an annual basis to meet a particular obligation. We think that is a very sensible way of incentivising households to make their energy consumption more efficient.

I guess the other things that we think are very much sensible policy ideas are things such as commercial and residential building standards and appliance labelling which provides consumers with greater information around how efficient an appliance is. In that context, it is worth noting where the growth in household consumption of energy is occurring. With space heating we have not really seen a change in the amount consumed per household. That makes sense because households are essentially consuming energy in the same way they were before. Even though the floor size of an average house is getting significantly larger, the efficiency of those particular space heaters is improving significantly, so you are seeing a somewhat of a static or no change at all in the consumption of energy for space heating purposes.

We are seeing a little bit of growth in space cooling, but most of the energy growth that you are seeing in terms of household consumption relates to electrical appliances. They are things such as bigger and more advanced televisions and different types of energy consumption in the homes—so the proliferation of information technology and all of those types of things.

CHAIR—In terms of energy efficiency, you talked us through a lot of the household side of things. But where would you see the biggest bang for our buck in terms of achieving the greatest gains? Would it be on the residential side of things, the industrial business side of things or in the generation distribution network sort of side of things?

Mr Nelson—I think without a doubt it is the commercial and industrial sectors. Because Australian electricity prices have been amongst the lowest in the world due to the abundance of fossil fuels that we have had, there just has not been the incentive in the same way that that incentive has existed around the world to deploy energy efficiency in a commercial sense. So things like the Energy Efficiency Opportunities Program, which is now into I think its third year, is showing that there are significant opportunities around the commercial and industrial end of the economy for making energy use more efficient, particularly in an environment where that sector is seeing movement towards carbon constraints.

Senator HUTCHINS—Mr Nelson, there are two areas I wanted to pursue with you with respect to your opening comments. The first is in relation to price regulation. You talked about 'the continual lagging of reform with respect to jurisdictional intervention and in most cases regulation of retail prices.' Would I be right in assuming that AGL may be of the view that we are not paying enough for our energy?

Mr Nelson—I think that when we talk about price regulation what we are essentially saying is that prices should be determined by the market and the market will come up with an efficient form of pricing. So it is not a case of saying it is too much or too little; it is a case of saying that, at the moment, the price is determined by a regulator. Our view is that in a market where a proportion of the final supply price is actually coming from the most volatile commodity market in the world, it is not good public policy for those prices to remain regulated. We just do not see that, over the long term, they will be set in a way which reflects an efficient price.

Senator HUTCHINS—So you might argue that the price of energy is too high.

Mr Nelson—As I said, it is not about being too high or too low; it is just that it is not efficient.

Senator HUTCHINS—In your sustainability report in 2009, you note the issue of continued government regulation of household and small business electricity and gas prices. How should we address this regulation? Should we just abolish the regulator?

Mr Nelson—We are very supportive of the Australian energy market in that it has been pursued through COAG, where effectively all state governments have agreed that, where competition is demonstrated to be effective, price controls should be removed. I guess where we would like to see movement is where states see that review undertaken and that review does conclude that competition is effective, those price controls be removed. We are very pleased and supportive of the Victorian government's decision to remove price regulation.

Senator HUTCHINS—I am not sure, but has that led to increased prices of energy in Victoria?

Mr Nelson—In relative terms to the rest of the country, I am not too sure. I can take that question on notice if you would like.

Senator HUTCHINS—Okay, thank you. It would follow that if you make this an issue you would have to conclude that you are not suggesting that energy prices are too high; you are suggesting they are too low. That is the way I read your comments.

Mr Nelson—I think the danger is, whether they are too low or too high, if they are not set at a level which reflects the underlying cost of supply, one of two things will happen. You will have too much energy consumed—and in the short term there might be some unintended benefits of that, but in the long term you will not see enough infrastructure developed. The converse is that if prices are set too high then you would unnecessarily impeded economic growth. What we are saying is that prices should reflect the cost of supply, and the most appropriate way to do that is to allow the market to determine what the price should be.

Senator HUTCHINS—Could you give us an example of the concern you just expressed in relation to lack of infrastructure?

Mr Nelson—The Western Australian example is a very good example. Over a significant period of time you had prices that were not reflective of the cost of supply—

CHAIR—It was politics.

Mr Nelson—and then at a particular point you had significant price increases. If I speak on behalf of our large commercial and industrial customer base, if there is one thing they would prefer over anything else it is sensible movements in prices that reflect that cost of supply rather than very significant step changes in energy prices, which tend to occur more often when you are having continued regulation of prices. We would always say that it makes sense for infrastructure planning purposes, whether it be governments or our commercial and industrial

customer base, for prices to be deregulated so that they can more adequately contract with an entity which is taking on that market risk and reflecting that cost going forward.

Senator HUTCHINS—On your third point about customer focused assistance, you are dismissive of rebates being given to customers rather than to entities. Why is that?

Mr Nelson—We do not really mind as long as the customer sees the benefit as a reduction in their energy bill. The concern we have is that where customers are in hardship, if a government program is designed to reduce that ownership, if the rebate is provided in the form of cash it will not necessarily be used for meeting electricity bill purposes, it might actually be used to purchase a piece of energy consuming equipment which would further push the customer into hardship. By putting the rebate directly on the energy bill it is addressing the public policy issue it is intended for.

Senator HUTCHINS—So in essence you do not believe that is changing people's behaviour.

Mr Nelson—The problem we face with assistance is not so much about changing people's behaviour but ensuring that customers in hardship continue to have access to an essential service.

Senator BUSHBY—Mr Nelson, I am interested in the issue of price regulation and the impact that has had on investment, also tying that into your second point on energy efficiency. What is currently happening with energy usage: is it actually going up? Is the current focus on energy efficiency actually leading to a lowering of aggregate energy demand? Where are we currently at?

Mr Nelson—Energy demand in terms of electricity generally is increasing, and these are very rough figures, around two per cent a year with peak pricing increasing by more than that. As an electricity retailer, what that essentially means is that you are seeing underlying demand growth representing increases in demand from commercial and industrial customers, and some growth from residential but more of the growth from residential occurring at those peak times when everyone switches on their air-conditioner. If you go back 20 years ago, most people saw air-conditioning as almost a luxury good. These days air-conditioning is considered almost an ordinary part of a modern household. So as more and more households get air-conditioning you are seeing the peak demand growth well in excess of the average underlying demand growth. If you follow that through to the energy efficiency component, what we are essentially talking about is two aspects. The first is peak demand management, and peak demand management is not so much a pricing issue as a technology issue, so things like the smart grid initiative are a great way of thinking through how we appropriately reduce peak demand in a way which ensures that the customer receives what they are after, which is essentially a cool house. With the average underlying growth in energy demand coming from things like electrical appliances, we are big supporters of things that encourage consumers to use less to achieve the same outcome. Things such as more efficient lighting and more efficient hot water are the types of things which we think can provide some pretty significant gains quite quickly. That is where the states have led the way in that space, and we think there is a role for the Commonwealth to bring all those schemes together, in a similar way that it did with the expanded renewable target incorporating the VRET scheme and the proposed New South Wales renewable energy scheme.

Senator BUSHBY—Do you have a view on what sort of percentage of energy use could be saved through energy efficiency measures?

Mr Nelson—It is really a question of what target the government sets. A lot of energy efficiency opportunities do deliver payback, but the question is: what is the appropriate level of transaction costs to build into your modelling of any opportunity? So it would make sense for all of us to go around every day and switch off all of our standby appliances at the power point because we would save money doing it and it would be a more efficient outcome. But what transaction cost do you ascribe to households for the time they spend walking around doing that? At the moment, that is where the real difficulty is—we are not actually talking about price barriers, in a lot of ways; we are talking about barriers in behaviour. That is where incentives—such as being given certificates which you can then sell to a retailer—come in, acting as more of a carrot than a stick, and I think we will see some more success with that type of approach.

Senator BUSHBY—So it is difficult to actually identify a percentage saving. To pursue that, because I am interested in the impact of the deregulation on investment and your comment on investment in future infrastructure: what are our future needs? Are we going to need in Australia—given the current trends, and even taking into account savings through energy efficiency—more baseload power in the coming decades?

Mr Nelson—Maybe towards the end of the decade but certainly in the short to medium term—so within the next, I guess, three to seven years. The focus of a company like AGL is on building renewables for the renewable energy target and peaking generation for that peak demand growth.

Senator BUSHBY—Because that is where you see the market opportunity for your company?

Mr Nelson—Precisely; yes. Longer term, there will be a need for new baseload capacity but it is very, very difficult to plan any baseload project at the moment in the absence of certainty around carbon pricing.

Senator BUSHBY—I understand the challenges there, but I guess I am asking these questions from a perspective of energy security, given the long lead-in times that it takes to actually get any sort of baseload power generator up. When does the nation need to start getting concerned if there are not new developments being started? And to what extent does energy price regulation impact on that?

Mr Nelson—We think that, over the long term, energy price regulation has a significant impact in that space, principally because the longer that prices are regulated the more challenging it is for an entity to know with any certainty what level of price pass-through is going to be allowed longer term. And whilst that is not a direct issue for a stand-alone generator, it is an implicit issue because, to the extent that prices are regulated, it sets an effective cap on the amount that wholesale prices can essentially be set in the longer term, because if the retailer is unable to recover those costs then they are not going to be able to pay the generator. So we see that, in the longer term, price regulation will lead to a suboptimal investment mix. What does that mean? Will the lights go off? Probably not; security of supply will be maintained. Will it be done in the most efficient way? Probably not; you will probably see installed too much peaking capacity that runs for too long a period, as entities do not install baseload capacity when

required. But we are not at the point where that decision would need to be made. We are talking a few years out before people would actually have to start moving towards building that baseload capacity.

Senator BUSHBY—Okay. The other thing you mentioned in your opening statement was the building standards, as part of your energy efficiency national plan. What impact are the types of changes that will be required to meet those building standards likely to have on housing prices? Is it an expensive thing to do?

Mr Nelson—It certainly does add to the upfront cost, but the payback period generally means that most of those measures pay for themselves within a single-digit year time frame, depending on what the measures are.

Senator BUSHBY—I will ask one final question before we move on. You are in the renewable energy business, primarily. As to electricity transmission, what challenges do you find with transmitting the energy that is generated over distance? Is that something that is of concern to you as a retailer or just in the price flow-through?

Mr Nelson—We actually find that the existing rules for transmission work very well for incentivising generation that is developed close to load centres. With the existing framework, when you are being paid as a generator, the closer you build your generator to the load centre, the less loss factor is applied to your plant. That means that the optimal way of developing a new power station is to find a transmission line that you can build your power station quite close to that is already quite close to a load centre. We think that the existing framework is very efficient. We would be quite concerned to see any move towards subsidising transmission infrastructure because we think that would lead to investment decisions that were not optimal and the risk of stranded assets longer term.

Senator BUSHBY—Do you have any views on the advantage of high-voltage direct current transmission?

Mr Nelson—No, that is a bit outside my area of expertise.

Senator McEWEN—Mr Nelson, I was curious about the interest level of your customers in using power from renewable energy sources. I think you said you have 3.2 million customers in Australia.

Mr Nelson—Yes, that is right.

Senator McEWEN—What is your perception of the willingness and enthusiasm of people to use power from renewable energy sources?

Mr Nelson—There are three types of customer, in very broad general terms. There is the relatively small group that would be prepared to accept 100 per cent renewable energy at a premium price compared to regular priced energy. There is the biggest group, which we describe as the middle group, which would be prepared to pay a premium, but not a significant premium, for renewable energy. Then there is the small group of customers who would not be prepared to pay anything for renewable energy.

To give you a feel for renewable more broadly, as part of last year's strategic sustainability goal setting, we set out to sell one terawatt hour of new renewable energy, which is a very significant number. That is basically a couple of renewable power stations. We set out to sell that and to become Australia's biggest renewable energy retailer as well as generator. We think that customers still have a significant appetite for renewable, and that is at the large scale. At the small scale, we are seeing customers move significantly towards uptake of small-scale embedded technology such as solar PV. That is largely being driven through incentives such as feed-in tariffs and the multiplier effect under the renewable energy target for solar PV.

Senator McEWEN—Are people prepared to invest in alternative energy sources like solar PV knowing that it will probably be quite a long time—more than a decade, in some cases—before they get their money back?

Mr Nelson—Certainly for solar PV it is hard to say because we did not see significant uptake prior to feed-in tariffs and renewable energy income being introduced. I think it is fair to say that, without those measures and double-digit yearly payback, you would expect to see less of an uptake than we have seen today.

Senator McEWEN—So people do need some support.

Mr Nelson—The evidence says that is right.

Senator McEWEN—The committee has had a bit of evidence about smart metering at the domestic level, which looks very attractive—you are able to see the energy consumption on the meter as you use the kettle, the plasma TV or whatever. Is that something that AGL is looking at to assist house owners with?

Mr Nelson—We are involved through the Victorian Advanced Metering Initiative, distributors are rolling out smart meters there. We are involved throughout the country in a number of smart grid initiatives. I guess there are two elements to smart metering. Firstly, they allow for more innovative pricing structures for consumers so consumers can shift their consumption between periods—they can shift consumption out of high-price, high-demand periods into lower demand, lower price periods. The other thing that smart meters allow for—and this is where I think you are likely to see significant change over the coming decade—is more innovative technological solutions. As an example, say you have 1,000 customers on a smart meter with smart technology installed with it, it is a peak demand period and they are all using their air conditioners. You might, to reduce that demand and minimise their costs, remotely change the thermostat on half of those air conditioners for 10 minutes and then do the same with the other half. The benefits of smart metering are not just the innovative pricing structures they allow you to put forward but also remote technological changes that will allow retailers and other market participants to have an impact on customers, in some ways without them even having to pay too much attention.

Senator McEWEN—Is that technology applicable in a retrofit situation or would it only really work with a new build?

Mr Nelson—Mostly with new builds. But Whirlpool, I think, have announced that from 2012 all of their appliances will be fitted with smart technology or will be smart enabled so they will be able to communicate with a smart meter in some way. Globally we are seeing appliance

manufacturers and other market participants develop technology which will allow these things to develop.

Going back to the issue around price regulation, to the extent that prices remain regulated and retailers are only allowed to charge a flat tariff or a set simple tariff for customers, the rollout of that smart technology will not actually allow retailers to do much in the way of innovative pricing.

Senator McEWEN—So the regulation is not really keeping up with the developments in opportunities—

Mr Nelson—Yes, over the medium term I think that is correct.

Senator McEWEN—I am just curious: do private companies like yours get tax breaks for investment in infrastructure?

Mr Nelson—Not that I am aware of, no. We are not a research and development company so we do not get all of the R&D type benefits. In terms of infrastructure, I think the taxation regime for us when building a new power station is the same as for any other proponent of a large piece of infrastructure.

CHAIR—Thank you very much, Mr Nelson and Ms McNamara, for your contribution to the committee.

[9.33 am]

DUNSTAN, Mr Christopher Gerard, Research Director, Institute for Sustainable Futures, University of Technology Sydney

LOVEGROVE, Associate Professor Keith, Representative, Australian Academy of Science

Evidence from Mr Dunstan was taken via teleconference—

CHAIR—Welcome. I invite you to make a brief opening statement, and then the committee will ask you some questions.

Mr Dunstan—Keith, would you like to go first?

Prof. Lovegrove—Sure, Chris. I have just handed out those handouts that I was telling you about before. Does everyone have a copy of this? I just want to make a little one-liner attention grab with each of those graphics, if I may. The first point is that here we are discussing energy, and I think it is important to get across the idea that energy change is upon us. It is not something we are planning for the future; it is happening now. Renewable industry is growing at a phenomenal rate and I am sure you have been told about peak oil.

The second graph is from ABARE and it highlights that change is the status quo. I think Martin Ferguson was recently quoted as saying that we need to spend $100 billion. I am not sure over what time period but the fact is that, as a matter of course, things wear out and get renewed. It is really about the direction we follow. I do not know whether you have seen the next graph before, but it gives you an idea of where the energy resources are. That big blue cube at the bottom is the annual amount of solar energy falling on the planet, as compared to all known reserves of other things. Wind, hydro and so on are a subset of the solar cube inasmuch as the solar energy creates, if you like, those forces of nature. What does that actually mean for Australia? That tiny square there, 138 by 138 kilometres, would be all of our primary energy needs—5,500 petajoules is the existing technology. But what I would like to make you think about a little bit is the biggest square which would be what would happen if we could power Japan with exported solar energy, which is an interesting concept.

I found a table in the recently released *Australian Energy Resource Assessment*, which I am sure you are familiar with. It is very instructive. It contains the value of our imports and exports. Under that, you will see a quick calculation that I have done to turn those into millions of dollars per petajoules. You will see the value of this stuff per unit energy. What you see is that our economy is very much dependent on coal exports, at $3.4 million per petajoule. Uranium has one of the lowest values, but the thing to really think about is that oil, at $18 million per petajoule, is five times more valuable than coal. But, more importantly, it is rapidly shifting to be our net major import. I suspect that is something that your committee is thinking about quite a bit. To leave you with a little bit of a thought starter at the bottom, what if we were to use renewable energy to convert coal into oil and exported it? I will end on that. Chris, do you want to make some comments on distributed energy and so forth?

Mr Dunstan—As I understand it, the key issues that were raised with me and which were of interest to you related to HVDC transmission, distributed generation, smart grid, alternative energies connecting to the grid, energy efficiency and security, of Australia's future energy supply. That is what I would like to speak about. The first point I would like to make is that in terms of our current electricity system the electricity networks are the main game. I say that because we are literally seeing unprecedented levels of capital expenditure on electricity networks over the current five-year period and in excess of $45 billion over the next five-year period. That is more than the cost of the National Broadband Network and in a shorter period of time. It is likely that that trend will continue beyond the current five years.

As Keith mentioned, we are now making decisions about our future energy system and they are not necessarily the best decisions. The impact of those electricity network investment decisions in terms of electricity prices is very significant. We are seeing about a 50 per cent increase in electricity prices in New South Wales over the current five-year period simply due to that network investment. Through the work that we are doing through the university, in conjunction with the CSIRO Intelligent Grid research program, which is a three-year research program focused on delivering major greenhouse gas emissions reductions through integrating what we call distributed energy into a smarter electricity grid, we believe that there is a very significant opportunity to moderate those increased costs to deliver a cleaner electricity system, lower greenhouse gas emissions, as well as provide a more secure electricity supply system.

There are a couple of steps that could be undertaken in order to facilitate greater uptake of distributed energy. Firstly, we need to recognise that, while we talk about the national electricity market, the electricity network businesses are regional monopolies. They are centrally planned, so it is absolutely crucial that government sets appropriate objectives for those businesses to work towards. Currently, we do not have them and I am happy to elaborate on that. Let me give you a couple of examples. We do not make it clear that there is a requirement for the networks to invest in distributed energy. Again, that is energy efficiency, peak load management and distributed generation wherever it is more cost effective. If we want a cleaner, more secure, more affordable energy future then the most important thing we can do is to say that is what we want to those people who are providing it. We need a clear objective for the network businesses and we need a requirement that they report annually on what they have spent and delivered in relation to the range of investments, including investment in distributed energy.

I think it is also important to invest in knowledge. Currently, we are not providing a coherent picture of our options for the future in terms of energy security. That needs to be done in a much more systematic way, drawing on not only government departments but also the research community. When it comes to smart grids, while in principle smart grids have a lot to offer we need to ensure that they go beyond just offering these benefits in principle. Smart grids need to support smart consumption through 'time of use' tariffs and need to provide significant incentives for people to move across to these. Recent developments in Victoria, I think, have highlighted that need. Finally, I have two points. Firstly, in relation to distributed generation, we can make it much easier for distributed generation to provide electricity into the grid by recognising the value it provides in terms of avoiding network infrastructure but we need to stop treating distributed generation as the last cab on the rank when it comes to issues of connection and recognising that value. I can elaborate on that.

My final point is in relation to electric vehicles. They are going to be a very big part of our future. Australia now has an opportunity to capitalise on that potential, but there could be a big problem if we do not prepare for them well in terms of the load they put on the network. If we prepare well then electric vehicles have the potential to shift us to lower emissions and lower costs and to provide a more reliable electricity system. I will pause there and let you ask the questions.

CHAIR—Thank you. I will start off with Professor Lovegrove and his initial presentation. That graph which shows existing electricity generators and the upgrades and new generation that are required, shows a picture where there will be a significant gap in a reasonably quick period of time unless action is taken. Do you think that we are currently on track to meet the new generation requirements, as they are outlined by this graph?

Prof. Lovegrove—I suspect we are not. There would be other, more qualified people to tell you. I think the minister is well aware that we are probably not yet making those infrastructure investments. It is kind of interesting that everything I have seen on levelised costs of electricity from various technologies suggests that the full price of electricity today would not even justify building a coal-fired power station.

The other thing that I am hearing evidence of is that the industry overall looks for investment certainty. Not knowing where we are going with the CPRS and a cost on carbon is a major part of that uncertainty. I think we have got just about universal acceptance around the world that there needs to be some sort of price on carbon and there should be some sort of price on carbon, but the lack of it is going to actually hamper investment decisions.

CHAIR—Are you aware of the green paper/white paper processes around energy security?

Prof. Lovegrove—Yes, I am aware of them. Through another forum I had a bit of a confidential briefing on where the paper was heading. I understand it might be quite some time coming out now.

CHAIR—It was supposed to come out by August last year. Have you been given an indication as to when it will be? When you say 'it might be quite some time', what is your understanding?

Prof. Lovegrove—Goodness me, I figured you would know that better than I would. I was getting the impression it could be later this year. You would be in a better position to judge.

CHAIR—We are only the parliament, Professor!

Prof. Lovegrove—It sounded like it would be later this year at best, from what I was hearing.

CHAIR—Looking at your second graph, obviously you have got a big cube around solar energy and of course everybody would agree that it has a lot of potential. But is there anywhere around the world where a jurisdiction is taking full advantage of the potential of solar energy in terms of actually providing—

Prof. Lovegrove—To clarify it, I think solar energy for these purposes comes in two flavours. There are the photovoltaic panels that people are quite familiar with now and there are solar-thermal power plants. Germany and Japan have really taken leadership on the PV panels. The solar-thermal technology has just started booming in the last five years. That is primarily in Spain and the USA. As we sit here talking, there is probably a gigawatt's worth of power station under construction. If you lump it all together—in fact, if you lump all renewables together—they have had 20 per cent per annum growth rates for decades, from a very low base. Now they are getting on the radar screen with continued growth at those levels, so it can all really make a difference quite quickly. Indeed, I would look to Spain and various states in the USA for leadership at the moment.

CHAIR—The argument that has been put over the last 12 months to us, and is always put to us, as a committee, as we have been looking at this, is that all of us would like to think that we can take renewables as far possible but there are limitations in terms of the reliable supply of baseload power. Would you like to address that?

Prof. Lovegrove—Yes. The baseload issue comes up a lot, doesn't it?

CHAIR—Yes.

Prof. Lovegrove—So let us talk about that. First of all, there is a plant in Spain that has been running for two years. It is called Andasol 1. It is a 50-megawatt plant. It represents the first solar plant in the world commercially built and commercially run with storage. It is built with 7½ hours of storage at full capacity or it can run for 24 hours at a lower capacity. It simply works. It is there, it is very simple, it uses just tanks of hot liquid molten salt and it works perfectly. So you can provide baseload solar power if you wish. One of the points as to the whole baseload argument is what Chris is getting to: if we think about it more intelligently, if we go to the smart grid option and the distributed generation, it is actually not really about baseload; it is about making sure supply meets demand at all times. So it is about dispatchability and working in the marketplace to optimise things. If you set the market up and you set up the smart grid so that consumers, where they have a chance, can control their loads according to the price and generators can control their generation according to the price, then it is not about baseload; it is about supply and demand and it is about dispatchability.

CHAIR—Talking about price, you seem to be across what is happening in Spain. How does the cost of generation and the cost of distribution of that sort of energy compare with those of other sources of energy?

Prof. Lovegrove—The generation costs?

CHAIR—Generation and distribution.

Prof. Lovegrove—Let me say it like this: I think the best way to look at costs is in relative terms.

CHAIR—Sure.

Prof. Lovegrove—I think today the generation costs with wind are somewhere between 50 and 100 per cent more than those with new coal and standard technologies. That would be my assessment and I suspect it will stay that way. Solar costs are considerably higher than that. They are probably nearly 100 per cent more again, because the industry is at a much earlier stage of its learning curve. I think what you will find in the long run is that solar can come down to something like wind and that those renewables will also end up being comparable to the fossil options with carbon capture and storage. Indeed it is likely they will outperform them, so that would be my assessment. I believe none of the renewables, just in straight-out normal terms, are going to get down to the cost of coal generation in Australia if we build a new plant today. So it is about putting a price on carbon.

CHAIR—Mr Dunstan, you mentioned that you would be able to go into a bit more detail for us on the question of distributed energy and its potential. What is already happening and what should be happening that is not yet happening essentially to put us in the best possible position?

Mr Dunstan—Maybe a good way to answer that is to refer to a study that we completed last year as part of our intelligent grid research program. In order to make our work on distributed energy—and by that I mean the three elements of energy efficiency, load, management and distributed generation—more concrete we looked at the case of New South Wales. Our objective was to consider whether distributed energy had the capacity to meet the New South Wales electricity needs out to the year 2020 and if so what it would cost to do that. We found that once you take account of not just the cost of generation but the cost of network as well, which is now becoming the dominant share of the electricity supply costs—so once you take account of those two parts to meet the growing need for electricity in New South Wales—distributed energy was significantly cheaper than by doing it with either coal fired generation or gas fired generation. We looked at a number of scenarios. I would be happy to forward that report to you if it was of value.

CHAIR—That would be great.

Mr Dunstan—The other interesting aspect that we found is that in New South Wales there currently is not a need for any baseload generation, on existing forecasts, until probably about 2019 at the earliest. If we can develop distributed energy—and I am happy to talk about key elements to develop distributed energy further—then we can push out the need for new baseload generation until well beyond that. So we have a window of opportunity now and we should be grasping it with both hands to develop these technologies that do represent the future of energy.

CHAIR—So what are the elements that we have to develop to grasp the opportunity?

Mr Dunstan—I do not want this to sound too much like an advertisement for our research program, but we undertook another report, which is available on our website, on 20 policy tools for distributed energy. We went through a suite of options for developing distributed energy. I will not go through the full 20 of them now. I will really give you just a couple of them. Currently in a number of states of Australia, the electricity networks are actually financially penalised if they assist the development of energy efficiency and, to an extent, distributed generation as well.

Under the way they are regulated by the Australian energy regulator—and the particular states I am talking about are Victoria, South Australia and, to a lesser extent, New South Wales—if they were to support those measures they would lose money. That is something that can be addressed. In fact, it has been addressed in the states of Queensland, Western Australia—although under a different regulatory structure in Western Australia—and the ACT. That is known as 'decoupling' electricity sales from network profits. That decoupling mechanism is very important and should be undertaken more broadly.

Secondly, in terms of distributed energy, at the moment, if you generate electricity into the local grid, that means that you are reducing the need for more transmission capacity. However, currently there is no way for the generator of that power to capture the benefits, at least the full benefit, of the avoided transmission costs. So a mechanism whereby we have, for want of a better term, a feed-in tariff or a default network support payment that passes on the saving in transmission costs directly to the local generator could be worth anything between $7 and $12 per megawatt hour. That could be quite significant in a business case for distributed generation.

The third point is that we really need to have much better information. In our report we recommend the establishment of an annual Australian distributed energy review, where we look at how much distributed energy is being installed, what the costs are and what the benefits are in terms of avoided network and centralised generation costs, and we have a consolidated set of data. They have been doing this for decades in the United States and we should have that information. Perhaps another step would be to have a coordination agency that is responsible for recommending targets to governments and advising, on a systematic and regular basis, on the range of barriers and the options available to address those barriers. I will stop there. As I said, there are many more options.

Senator HUTCHINS—I have a few questions. As you are aware, gentlemen, the inquiry is looking into our future energy security and needs. The committee has been going for some time now and we have had the opportunity not only to have evidence given to us by a number of people equally as concerned as you but also to observe developments in North America and Europe—in particular, the decision by the UK and the United States to begin construction of new nuclear power stations and the continued reliance by overwhelming parts of Western Europe to continue to use and rely upon nuclear power. Is nuclear power an option that we should keep open in light of the intention of government to reduce our greenhouse gasses?

Mr Dunstan—Keith, I am happy to reply first.

Prof. Lovegrove—Go ahead, Chris. I certainly have a few thoughts on it.

Mr Dunstan—In my view, the question of whether nuclear should be officially on the table or not is probably less important than looking at the economics of nuclear power. We have had the benefit of very cheap power in Australia, and nuclear power would be significantly more expensive than our current electricity supply. There is another element to that—that is, because we have had such cheap power for such a long time, we do not use power anywhere near as efficiently as many other countries in Europe, in particular, and other countries around the world. It means that we have a much greater reserve of energy efficiency potential that we could tap into before we would need to consider options such as nuclear.

The third point I would make is that, given that we have not established a nuclear power industry in Australia, it would take quite a number of years to develop that. And in terms of the long-term strategic security of Australia it may be better to focus limited resources on the emerging technology, including those that Professor Lovegrove has referred to, over that 10-year period; otherwise, we could find that by pursuing nuclear we are backing a losing horse in terms of the economics in 10 years time.

Prof. Lovegrove—I would like to add a few things to that. The nuclear review, the UMPNER review, of a few years ago was a very well-written report. It is still pretty valid, as far as I can recall. They were predicting that, even if we made a 'go' decision tomorrow, it would be 10 to 15 years before we could have a working plant, so it does not really help us with our immediate needs.

One of the issues I would raise is that, in Australia over the last few decades, we have had this microeconomic reform that has favoured market mechanisms for providing our electricity, and we are using it to bring up our renewable sector—and we are talking about having it for our CPRS. As we have embraced those market mechanisms—and I think they are actually a very good way to go—then, even if you removed the ban on nuclear and threw it wide open, I question who is going to actually make the investment to build that first plant, or even the second plant. I think you will find it just loses in the marketplace.

In terms of where nuclear is in the world today, it is certainly true that we have heard some announcements but, at the moment, more gigawatts of wind are installed per year than of nuclear power. That upcoming industry has passed the nuclear industry by to a large extent. Maybe nuclear will get revived, but wind seems to be winning in the global marketplace. I am not personally a great supporter of it, mainly for the connection to the weapons issue and nuclear proliferation. If we are going to have it, why can't everyone else have it? And if everyone else has it, we are just that much closer to proliferation. So, if you lay it way open and let the marketplace decide, I suspect it is not going to grow very fast, and I cannot really see much point in Australia getting involved.

Senator HUTCHINS—Professor Lovegrove, you said there should be a price on carbon. Are you saying that there should be a user-pays principle for using energy? So, rather than have what was being suggested by the government of a cap-and-trade and all the rest of it—

Prof. Lovegrove—No, if I could clarify—

Senator HUTCHINS—You did say there should be a price on carbon.

Prof. Lovegrove—I want to see some pricing of carbon by some mechanism somehow. I am actually pretty ambivalent. I do not really care how it is done. I think the CPRS model, the cap and trade, was a perfectly good model as far as I could see—although I think the cap was not ambitious enough, and so the price we would have got was maybe $10 a tonne or something. To my mind it does not matter too much, so long as there is a price somehow and there is enough certainty for people to plan about it.

Senator HUTCHINS—The modes of transport of rail, road, and shipping rely on diesel. What alternative is there in your opinions to the current reliance on that product? And is it

reasonable to think that these biofuels will be the alternative down the track to face the significant volumes, thousands of tonnes, that rail, road and shipping use?

Prof. Lovegrove—Chris has already mentioned the electric cars option, and I think we probably will see more electrification of rail and personal transport. But I do not think that is the final answer; there is a lot to be said for a liquid fuel. In the end, you could put the liquid fuel in a fuel cell in a hybrid electric car, for example.

Conventional biofuels will run into land use constraints, which we already know. It will be: is it food or is it fuel? So that may be only an interim solution. There is a concept called second-generation biofuels, which starts to be a convergence with what I was alluding to in my last little picture of the coal gasification. These are ways of processing a much wider set of raw materials much more efficiently. You take it all until you have a soup of carbon monoxide and hydrogen, and from that, in what is called the Fischer-Tropsch process, you can synthesise methanol, and from there you can synthesise diesel substitutes and basically make anything you like in the whole oil products chain. So think 'syngas', which are COH2 mixtures, and then we just build whatever we like.

Coal-to-liquid is a very long-established technology that the South Africans are experts in, for example, but it is incredibly CO2 intensive in the way it is done at the moment. But if we start to think about bringing some solar energy into the loop and doing it more creatively, I think there is a way to sustainable liquid fuels, which I think will have a role to play for a very long time. I cannot think of any better mechanism for Australia to export its energy and earn income from than a liquid fuel.

Senator HUTCHINS—As you may be aware, because of the price of fuel the use of huge container ships is slowing down, which is slowing down trade, but they are also looking at becoming nuclear powered.

Prof. Lovegrove—Right—well, we will see.

Senator BUSHBY—Thank you for coming along today

Mr Dunstan—Before we end, may I make one comment on the earlier question.

Senator BUSHBY—Yes, sure.

Mr Dunstan—I refer to the question raised about a carbon price. I thought it would be worth making a suggestion on the options that are available to the government for the emissions trading scheme. It seems to me that there is the possibility for something of a compromise that draws on the best components of the government's, the opposition's and the Green's proposals on putting a price on carbon. For example, instead of going to, more or less, full auction, it could be simpler to impose a price of, say, $20 a tonne, which I understand the Greens have proposed, on the last 10 per cent of emissions. So essentially you give away permits for the first 90 per cent and impose a $20 per tonne carbon price, if you like, on the remainder. That would raise about a billion dollars a year, which is essentially the amount of money that the coalition has proposed to spend on the direct action measures. I think there is very much a need for a price on carbon. An emissions trading scheme is an option to do that, but alternative direct action and complementary

measures are also important. So I think there is an opportunity to, as I say, draw on the best of those proposals. If it were established in that form, it would look very much like the existing New South Wales emissions trading scheme, which has operated very successfully since 2003.

Senator BUSHBY—I want to go back to the coal-to-liquid idea. You mentioned that one of problems with the current approach is that it is very CO2 intensive, and that is presumably because you are using carbon based energy forms to provide the energy required. Is that the case?

Prof. Lovegrove—Yes. You are effectively burning a bit of your coal to gasify the rest of your coal and drive all the processes. So you end up with less energy coming out than you are putting in, even though it is in a higher value form.

Senator BUSHBY—It puts out CO2 as part of the burning process, but it is also not that energy efficient in the long run to do it in the way it is currently done because you get less energy at the end than you put in, whereas with solar energy you have energy that is just coming anyway.

Prof. Lovegrove—Yes, that is right. All the energy to drive the process you put in from the solar side, plus you have added energy so that your final products have solar energy captured in them as well.

Senator BUSHBY—That is the environmental issue in terms of the problem with the current process. Presumably, though, if it were cost effective to be doing it now, people would be doing it.

Prof. Lovegrove—Yes, I think that is fair to say. With coal to liquids in a standard form I have heard suggestions that, if the oil price stays above US$70 a barrel, these things will start to come in.

Senator BUSHBY—That is using the current approach of burning coal?

Prof. Lovegrove—Yes. I am not offering up the solar coal to liquids as being cheaper; I am offering them up as being cleaner and a transition to a completely clean future.

Senator BUSHBY—That is what I was going to come to—the cost issue of it. Presumably solar energy, on the basis of evidence that we have had before us, has a higher cost per unit of energy at present. As the technology develops and the scale develops, that may change over time, but at present it is one of the higher cost sources in terms of actually delivering energy. Wind is apparently the most cost efficient of the renewables.

Prof. Lovegrove—Of the clean energy options, yes.

Senator BUSHBY—Then obviously coal is much, much cheaper.

Prof. Lovegrove—I believe that the solar options will eventually come down to meet wind in a decade or so of development, and then they will have advantages of having a lot more sites available and being more dispatchable. That will be why people might choose solar at that point.

Senator BUSHBY—In terms of the coal to liquids, you are saying that maybe this is something that we need to plan ahead for that could be a cost-effective and environmentally friendly way to meet our needs.

Prof. Lovegrove—Absolutely. You are talking about energy security—

Senator BUSHBY—Not necessarily next year but maybe next decade. That is what we might need to think about.

Prof. Lovegrove—Yes. Thinking about Australia being very dependent on oil imports, all the arguments suggest that, if we have not quite reached peak oil, we more or less have and if the price is still fluctuating it is going nowhere but up in the long run. So it will not be long before coal to liquids are actually cost effective, and solar coal to liquids is something to think about to address greenhouse and energy security simultaneously.

Senator BUSHBY—I understand where you are coming from. It is a longer term thing and we should look towards ensuring that the regulatory environment and the aims of government align to make sure it is possible.

Prof. Lovegrove—Yes, absolutely.

Senator BUSHBY—While we are on the environmental side of the issue, presumably if you take coal and turn it into diesel it is still going to be putting out CO2 gases and other things that are not particularly friendly in terms of the climate change debate.

Prof. Lovegrove—Indeed, but not as much. So it is a transition. The whole technology would be compatible with CCS, if that is working.

Senator BUSHBY—So it would be similar in terms of environmental outcomes.

Prof. Lovegrove—Yes.

Senator BUSHBY—The other thing is your graph with the small green squares on the map of Australia. How does cost come into that? Obviously a 138 by 138 kilometre green square looks small on the map of Australia, but that is actually quite a large thing in reality.

Prof. Lovegrove—So does the cost of the land have an impact? Is that what you are getting at?

Senator BUSHBY—The cost of the land and also the cost of transmission. Presumably we would have a number of them.

Prof. Lovegrove—This is purely notional. I hark back to Chris's point about distributed generation. That comes in two flavours as well. There is small-scale distributed generation within cities but there are also renewables such as the wind farms we have. That is distributed generation as well—tens of megawatts scattered here and there. So solar plants, grid connected, are likely to be scattered all around the place. Like the wind farms, they are compatible with multiple land uses. I think the best place for a solar plant is probably marginal grazing land well

to the west of the great divide. You put the collectors there, the farmer gets extra revenue and it probably does not even reduce the carrying capacity of the land because it is actually a bit of shading.

Senator BUSHBY—You might have a bit more green underneath it.

Prof. Lovegrove—You might have a bit more green underneath it. So it is not like you have just alienated a big square in one place. You would never put it in one place.

Senator BUSHBY—No. You are saying that that would cover all of Australia's energy needs but you still have to get there. WA is not connected to the grid currently, so you would need to—

Prof. Lovegrove—That is right, so you would move it around. One of the interesting points is that our best solar resources are a long way from the grid, so it is probably not practical to connect it all that way, although we really should think about some grid extensions. There has been a lot of talk about the fact that to unlock our geothermal resources we need some major transmission lines. That is certainly worth considering and, if you do consider it, the advantage is you pick up a lot more solar resources while you are at it. It will be a long time before we put a transmission line to northern Western Australia from Sydney, but we could certainly go a little bit further inland.

Senator BUSHBY—You or Mr Dunstan also mentioned that we are making decisions now about future energy needs that are not necessarily the best decisions. Was that you or Mr Dunstan who mentioned that?

Prof. Lovegrove—I think Chris said that but I will second it.

Senator BUSHBY—Okay. Would you care to expand on that? What decisions are being made that are not the best decisions, and how could those decisions be improved?

Mr Dunstan—Sorry, it is a little bit difficult to hear. As I understand it, the question was: what additional barriers are there that need to be—

CHAIR—No. You made a statement earlier that we are doing things that are taking us in the wrong direction, essentially.

Senator BUSHBY—That the decisions being made are not the best decisions.

CHAIR—Could you expand on that?

Mr Dunstan—There are quite a number of aspects to that, but let me talk about one that I have not spoken about so much to date, and that is in relation to electric vehicles. In terms of the issue of oil security, I think that electric vehicles will inevitably come into play in a very significant amount of our transport needs. If you simply do a basic comparison of the cost of energy in the form of electricity to move a passenger vehicle around compared to the cost of petrol, electricity—even renewable, 100 per cent green power—is about 25 per cent of the cost of petrol. So there is a very significant cost advantage in moving away from petrol towards electricity, even if we go for renewable or zero-emission electricity.

The reason that is not happening at the moment is essentially the cost of the battery. There is other equipment as well, but the key parameter that needs to shift is the cost of batteries. That is coming down and has come down very significantly, driven by the electronics and communications sectors. Because of that shift in the cost of batteries we are now seeing the likes of General Motors, Renault, Toyota and so on committing to putting electric vehicles in various forms on the production line within about 12 months or so. So that transition has already begun.

In terms of possible wrong directions, if people were to buy large numbers of electric vehicles—whether they be pure electric vehicles or hybrid electric vehicles, which I think are likely to dominate for the foreseeable future—and if people are simply bringing their vehicle home and plugging it in to charge up then they would be doing that at the time of peak demand. Particularly in winter, in the residential sector the peak demand is early evening, and even in summer peak demand risks becoming more dominant in Australia. That period potentially represents a very high peak load due to air conditioning, with residential air conditioning overlapping a little with commercial air conditioning.

If that happens to a large degree, then that would create either reliability problems or a very significant additional cost to provide the network capacity in particular but also the generation capacity to meet that requirement. If we have smarter controls, when you come home and plug your vehicle in, instead of it starting to immediately draw from the grid, it would have the smarts to say, 'I know that there's a lot of demand on the grid at the moment; I'll defer charging up until, say, 10 or 11 o'clock at night because I know there is still ample time to charge overnight.' If we do that, then we avoid the additional costs and potential reliability problems of doing that but we also create a number of other potential benefits.

For example, going back to the discussion earlier about baseload power, if baseload is taken literally to represent the amount of power that would be required 24 hours a day, we have an artificially inflated baseload in most states in Australia at the present time because we are using off-peak electricity for water heating. If instead we could use that baseload power for charging vehicles, that means we would have a greater capacity to rely on solar water heating instead or off-peak electric water heating. So we get a double benefit there in terms of a lower cost of transport—in terms of personal passenger vehicles for example—and the benefit of optimising what we call baseload power. That is one key step that we need to take in the next few years to set up not just technical but also consumer engagement in institutional mechanisms so that we have appropriate signals for time-of-use electricity tariffs and arrangements. That is an absolutely crucial element now.

Secondly, in terms of the potential for peak load management, we know there is enormous potential for us to moderate the growth, if not eliminate the growth, in peak demand by tapping into greater flexibility in how people use electricity. If we were able to take greater advantage of those opportunities in commercial industrial and residential contexts, we have the potential to avoid a very significant chunk of, as I said, about $45 billion of new network capital expenditure. In doing so, we are also facilitating other cleaner and lower cost use options around energy efficiency and distributed next generation.

Senator BUSHBY—It appears that the decisions that are not being made well appear to be decisions that are made not so much at an overall governmental level but more in terms of

behavioural patterns of people and where government can assist is maybe providing incentives to change those.

Prof. Lovegrove—I will add very quickly to this non-optimal decisions thing. Maybe what we are seeing is a missed opportunity to make some more courageous decisions, if you like, and the biggest one at the moment is that we have now not got a price on carbon, so that is a huge missed opportunity and the longer we delay that the more we set our country back, I feel. But we have a lot of other things. We have a national electricity market and we have a renewable energy target, and they all have rules in them. I think that, with a little bit more thought—you see, we adopt these things and then we accidentally make them too simplistic. The fact is that distributor generation does not see the benefit of its true cost savings; that is not captured in any market mechanism. That is a little missed opportunity. Think about the renewable energy target. There is nothing in there that gives an incentive or a recognition to the time of day you generate it and whether or not it correlates with when the demand was high. By doing that we are disincentivising people to make their renewables despatchable, which is a little bit crazy, I think you would recognise.

Senator McEWEN—I was going to ask Mr Dunstan about electric cars but he has covered all of that. And, Professor Lovegrove, I was going to ask about the importance of the RET. This committee has heard evidence about all kinds of renewable energies, including wind, wave, geothermal, solar PV, solar thermal et cetera. Which ones are going to fly, or are we going to have a mix of all of them? How important is having the RET correct to ensure that we do get the—

Prof. Lovegrove—I am a great fan of the RET. I think it is probably the single best policy measure we have had in quite long time, and both sides have embraced it and improved it. We should just keep growing it and improving it. What I am suggesting is to try to get a time-of-day signal in there and avoid things that accidentally cause the price of certificates to drop so far that you damage the industry. We seem to have addressed that recently; that is good.

The Solar Flagships program sort of recognises that RET in itself will not bring on a new industry that is not yet mature, so you have to give a help-up to the very first stages of an industry. Once it is up there, something like a RET should do it. But let's not stop at 45,000 gigawatt hours by 2020; let's continue to grow that. If you see that the industry is able to keep up with or even exceed the targets that are in there year by year—which historically it has—think about putting them up. Every time you see that price dropping, put the target up a bit more and make everyone stretch a bit harder. That would be my advice.

CHAIR—Thank you very much. That was an interesting closing statement. Thank you very much for your contribution to the committee, Professor Lovegrove and Mr Dunstan.

[10.33 am]

LAVER, Mr Peter John, Vice President, Australian Academy of Technological Sciences and Engineering

CHAIR—Welcome. I invite you to make a brief opening statement and then the committee will ask you some questions.

Mr Laver—Thank you, Chairman. On behalf of the 750 fellows of our academy, I thank you for the opportunity to appear again before this committee. In Melbourne we outlined the work we were doing on energy particularly new technologies in relation to energy that are aimed at securing Australia's future energy requirements both in terms of security and optimum cost. At that time we expressed a concern that insufficient emphasis was being given to promoting investment in new energy technologies or energy efficiency technologies. All of the discussion about emissions trading seemed to be more directed towards worrying about compensating industries or households that were affected. We felt that really the emphasis, as it was in the Garnaut report, should be focused a lot more on promoting investment that actually fixes the problem. You only need to do it once, whereas, if you keep compensating people it goes on forever. So we expressed that concern at that stage.

We also expressed the concern that, if we are going to get efficient production industries and efficient utilisation of energy, it is pretty stupid to tax or put imposts on industry that are unrealistic in terms of available technology. If you are running a cement plant or a steel plant or an aluminium plant and you are already at world's best available technology, to put a carbon cost on that just means it is a tax. You have just got to go and plant trees somewhere because there is nothing you can do, there is no additional financial incentive that can be provided to make you work more efficiently. So our line was very much that we would like to see something that encouraged people to invest in world's best practice in energy efficiency and energy generation.

Since that time we have continued to work in this area, particularly examining new technologies, and we have started to develop a concern that energy security is going to be an issue that Australia will have to contend with very soon. At the present time I think we have been living in a paradise where things like energy rationing, blackouts and the like do not occur, but it will not take too many inadvertent failures of old generating plant in different parts of the country to suddenly get us to a situation where we will not have enough electricity available.

The problem is that there has been an investment drought. There has been very little investment in significant new technology, particularly baseload technology. This comes about through the uncertainties that have arisen in terms of a price on carbon. Investors are not rushing to invest in this until there is some degree of security, no matter what it is, as far as their investment is concerned.

At the same time there are investments talked about in new technology, but the ones that are there are not really at a mature stage. We are worried about, for instance, the reliance that the government seems to be placing on carbon capture and storage. It will probably work, but it is not a panacea. Yet, if you look at the Treasury projections, it is really the only game in town: by

2050 it is a very large proportion of our energy generation. It may not work. Certainly our concern is that it will, at best, be a niche type of technology that will be used where it happens that there is a source of carbon dioxide from coal fired generation and a place where it can be stored. There are a few places like that, particularly in Gippsland, but there are other places in New South Wales where there is a lot of CO2 and no obvious place where it can be stored. And to pipe supercritical carbon dioxide—liquid carbon dioxide—at high pressure any distance is going to be extraordinarily expensive. So the blithe assumption that is being made that CCS will fix everything is something that the academy has some degree of concern about.

Likewise with renewables: we hear talk about 20, 30, 40 or 50 per cent intermittent renewables, but that does create a problem. Most people will say the grid can probably handle 20 per cent with smart grid technology and perhaps an investment in transmission, and that figure can probably creep up a little bit. But when we hear talk about 50 per cent renewables, the experienced people in our academy are very concerned that that would lead to incipient grid instability far too frequently. So there is a concern about the reliance that is placed there.

Things like geothermal are a good idea. The technology is not mature yet. Unfortunately it is likely to generate electricity in places where it is not needed. We have got to be a bit creative. Marrying solar thermal to geothermal, for instance, would be an excellent idea because you would get the ability to even out the peaks and valleys and you could actually enhance your geothermal generation through the use of solar thermal.

There are a number of ideas that can be used there. Combine that with a smart grid and combine a smart grid with the National Broadband Network, the NBN—because smart grids work if there are good communications. We are investing a very large amount of money in the NBN. We really should be putting the whole idea of smart grids sitting alongside that, because to be able to communicate in the way the National Broadband Network will actually make a smart grid work a lot better, particularly on managing the demand side.

The other concern we have got is the blind spot that exists in relation to nuclear energy. We are not nuclear advocates as such. All we want to see is a level playing field, with nuclear being examined in exactly the same way as any other form of energy. It should not just be said that, because it takes too long or something, it should be set aside and not considered. We believe that there is a prospect; it is probably a little way away. Most of the problems that people raise in relation to it can be solved. Certainly the work that is going on around the world in respect of nuclear is accelerating the application of efficient technology that will be intrinsically safe.

The final thing I wanted to say in the opening remarks is that, two weeks ago, we had a seminar in Sydney on, among other things, smart grids and energy security, and I was somewhat chastened by a paper from an overseas investor in the electricity industry who said that, within the last five years, Australia's reputation as far as investment in the energy sector is concerned has suffered a very severe decline. We have always been seen as a low-return environment—it is a competitive market so the returns are relatively low—but we were traditionally seen as a low-risk market: we had stable government and government policies and so on. All of a sudden in the last decade this has changed and we are now seen as a high risk—a sovereign risk—and a low return, which means that we have to compete very seriously with a lot of other places which require investment in their electricity industry.

This investor, who is a major operator, said that he would prefer to spend his money in places like Thailand or Vietnam because they can do a 25-year deal and you know that it will be honoured completely without any changes of the rules. He went on and instanced the way we have played around with the MRET Scheme. I was actually involved in the report of a committee that was chaired by Grant Tambling about five or six years ago that recommended 20 per cent. That was knocked back and, thereafter, a lot of the renewable energy industry dismantled itself because there was not the incentive there. Just as it had been dismantled, we upped it to 20 per cent again. This is the sort of thing that makes us a laughing stock in the eyes of international investors.

The politicising of the arguments on carbon price is having the same impact. People are looking bemused and keeping their wallets in their pockets because they see that they are faced with a chaotic investment environment. There is a major concern about this situation. Unless we can get some bilateral support for a sensible energy policy, we are going to be faced with a major problem in relation to investment in the electricity industry, and all these concerns about energy security will come to pass.

Australia has had a terrific competitive advantage in the past through its low cost of energy. We are running the risk of destroying that competitive advantage in the world by some of the things that are happening—the lack of investment here and the somewhat short-sighted and political approach that has been taken to energy policy. I am happy to take any questions.

CHAIR—Thank you very much. In your submission you talk about the need for Australia to have a major increase in baseload electricity power generation capacity to meet expected growth and demand. We have had a number of witnesses, including this morning, telling us that baseload is really not the main game in town, that really what matters is for supply to meet demand at all times, that if we find better ways of meeting peak demand then really that is what we should be putting our focus on. What would be your response to that?

Mr Laver—We believe that the intermittent sources of power—wind and solar, mainly—cannot be relied on for that. There is a belief in Australia that if you spread your wind farms out far enough the wind will be blowing in South Australia when it is not blowing in Portland. But in many respects I think that is risky thinking in terms of grid stability. I think our experts believe that the age of our existing baseload plants are such that we are running a risk of shortages before very long. It will be covered by quick installations of open-cycle gas plants which will be quite attractive because they can be small scale and relatively low cost and respond to load variations pretty quickly. But it is not a long-term answer. They are not efficient from a greenhouse gas viewpoint. While greater reliance on gas as a short-term solution might be attractive, as a long-term solution we would like to see our sources of supply diversified considerably.

CHAIR—Sure, I understand that. But if you had to summarise succinctly the key argument as to why a major increase in baseload electricity for power generation capacity was necessary—that just relying on growing our renewable energy capacity was not going to be sufficient to meet our demand moving forward—what would be your key argument?

Mr Laver—We believe with the present grid maybe 20 per cent intermittent renewables is about as far as we would go. We have gone as far as we can on hydro. Geothermal is baseload,

but it is still a question mark. It is a long way away and could be very expensive. Nuclear is out of consideration because of present government policy. The Treasury estimates or government estimates of future baseload all relate to carbon capture and storage from brown and black coal-fired power stations. We are just expressing a concern. It may be right, but I think it would be incumbent on us as applied scientists and engineers to say that we can fully support that. CCS is good technology, but it does not capture all the carbon. It is energy intensive in itself, so you actually use more coal to run the process. Certainly if it has to be transported a long way it can be extraordinarily expensive. Certainly nuclear will look quite attractive.

I do not know whether you saw it, but in that august publication the Melbourne *Age* on Saturday there was a report of the International Energy Agency's most recent costing work. It is cause for concern. It did not look at nuclear in Australia but it did look at black coal and carbon capture and storage, and it comes out with an energy generation cost of $US56.62 per megawatt hour. That compares with things like nuclear in Korea at $29.05. That is the concern that we have: we are chasing technologies that are going to undermine the competitiveness of Australia. Traditionally we have been a low-energy-cost country but, because of our energy policies, we are going to become a high-energy-cost country and destroy some of the international competitiveness that we have.

Senator McEWEN—Mr Laver, you commented about the lack of investment in energy infrastructure in Australia. Can you tell us a bit more about your insights into that? In particular, are you talking about energy investment in non-renewable technologies like coal and gas and/or renewable energies?

Mr Laver—In non-renewables, in base generation, because the investment comes in big chunks there is uncertainty about what regime will be there. There are plenty of opportunities in China and right through Asia for capital, looking for investment in the energy industry to find more attractive prospects than here. That is our concern, that we have got to improve the investment environment for, if you like, the fossil fuel base material.

As far as renewables are concerned, there is a little bit of a problem there. In the Tambling report we called it the 'low-hanging fruit syndrome': all the good wind sites, or the ones near the existing transmission lines, are already taken up. As you go on and increase capacity you either get further away from the transmission lines or you get into lower wind yield places. While there is a technology learning curve, now that the turbines are getting bigger, more efficient and so on, we are not sure that the other factors—the location relative to the grid plus the wind yield—plus, you would have to say, the NIMBY problem that wind has. There have been reports recently that people are saying they are getting sick from the noise of the turbines. That is a new one. Most people worry about visual pollution and noise, but they say that the low-frequency vibrations are causing illness around that one in central Victoria.

It is a battle, and sites will become harder. Again you have the very variable policies—MRETs on, RETs changed—nobody is exactly sure. So the investors say, 'Why should I put myself through that sort of variation and all these types of things?' That is not to say there is not significant investment going on or that it will not continue. But it is not anywhere near the magnitude that we are going to require to meet our future requirements.

Senator McEWEN—The important factor in that is the certainty. Business needs to know whether there will be a carbon pollution reduction scheme or whatever you want to call it, and also certainty in the RET scheme.

Mr Laver—Yes. This guy said even the name of the scheme he could not believe. He knows about air pollution, he knows about water pollution—that means you get pollution out of air and out of water. He said, 'Are you trying to get pollution out of carbon?' The idea of a pollution reduction scheme is to get rid of it all. If we got rid of all of it we would all be dead. We really are sending some very odd signals to international investors by the sorts of things that are going on here.

Senator McEWEN—On the other hand, there is no world agreement, as we know, on a carbon pollution reduction scheme. So why are investors saying, 'We won't go to Australia' when the same thing is applying in America and the European Union?

Mr Laver—Indeed, the same uncertainty is there. For the European Union, I think, there is a greater degree of certainty, but certainly the US investors must be confronting similar sorts of quandaries. But because of the relative cost structures there and the lack of political opposition, things like nuclear are on the table there and they can probably quite safely say that they can invest in nuclear if it is going to compete with coal with any carbon price attached to it at all.

Senator McEWEN—You mention there the opportunity that the National Broadband Network gives us to roll out smart grid technology. What do we need to do to ensure that that opportunity provided by the NBN is taken up?

Mr Laver—I think that it is incumbent on the people developing the NBN to talk to people like Energy Australia who have done a lot of work on this. Some of their ideas have indicated that we can make our smart grid work a lot better if we integrate communications so that we do not put our planning in separate little boxes because it happens to be a different government department. There really should be a whole-of-government approach taken to those types of things. Smart grid is communication and NBN is communication and the two need to be aligned if we are going to get the best benefit from both. I would have thought that the NBN people would be delighted because it is yet another service that it can provide that justifies the investment being made in it.

Senator McEWEN—A potential revenue earner.

Senator BUSHBY—It is energy security that you have been talking about that interests me most. You noted in your submission that Australia requires a major increase in baseload electric power to meet the expected growth in energy demand in the coming decades. But listening to you this morning, I do not know that you have really put forward a strong opinion on where that should come from. You have mentioned that gas turbines may provide the medium-term answer but in the longer term it was unclear to me what you thought we should be doing.

Mr Laver—We have always taken the view that Australia's energy future is a portfolio of technologies and—I do not like saying it in these terms—the market should really decide. There should be no constraints placed on doing proper economic evaluations and the regulations should be neutral so that you do not regulate in such a way that you burden one or the other. But

if we had to dream of a portfolio for 2050 we would have coal with CSS, gas with CSS, and probably closed cycle gas, nuclear, geothermal, solar, wind, and solar-thermal, and particularly for distributor generation, solar photovoltaic, plus maybe even an odd niche somewhere with a wave and tide—

Senator BUSHBY—That is all part of the 20 per cent that you think is the maximum that we really should—

Mr Laver—Wave and tide is probably halfway in between. Tides come most days. It is really wind and solar that we are concerned about when it comes to grid stability problems if they creep up too much without a major investment. If you invest in the grid—

Senator BUSHBY—The issue with the grid is if you expand beyond the 20 per cent of renewables—

Mr Laver—And storage. We need to find some way of storing. There are some interesting ideas around. The demand side is going to get varied too particularly as we go to electric vehicles. I was hearing the other day, for instance, that the batteries in electric cars do not last forever, if used daily up and down, probably a couple of years. But they have still got some usage and you can put them in a great store yard somewhere and use them as storage. As more and more second-hand batteries get there in a storage yard they do not have to be charged and discharged every day; they can be in long-term storage, if you like. So it is just to meet peaks.

Senator BUSHBY—So energy from the sun or from wind, if it is blowing, to provide extra peaks.

Mr Laver—That is right. It is like pump storage in a hydro system. At times when there is surplus, you can store it against times when the wind is not blowing. So there are some innovative ideas around that we need to explore which will help that renewable component edge up.

Senator BUSHBY—But in the meantime, you think that the current baseload is insufficient to meet our demands.

Mr Laver—The current baseload is okay, but the trouble is that a lot of it is getting old.

Senator BUSHBY—Yes.

Mr Laver—It will need to be replaced, and people are doing patch-up maintenance pending a clearer understanding of what they are going to be up for in terms of the carbon price.

Senator BUSHBY—You mentioned all the uncertainty and the sovereign risk, which makes it that much harder.

Mr Laver—That is right.

Senator BUSHBY—Looking at it, you are saying that we have got power stations that need replacing or major upgrades and investment to be able to continue to provide the baseload power

that we need, at least in the short to medium term. If we could find somebody who was willing to invest in Australia in baseload power, what would they invest in now?

Mr Laver—It would be open cycle gas.

Senator BUSHBY—It would have to be open cycle gas?

Mr Laver—That would be the only thing that would provide a sufficiently low capital cost, smaller modular size and reasonable return on investment at current gas prices.

Senator BUSHBY—So in your view we need to have investment in that type of technology in the short to medium term.

Mr Laver—And there have been some announcements along those lines—relatively small, 100 megawatt type units.

Senator BUSHBY—But in the absence of that we may well face energy supply issues?

Mr Laver—Yes. There seem to be as many different opinions as there are experts on this. I heard the last speaker say that they did not think New South Wales would have a problem until 2019. That would come as a surprise to some of the people who actually work in that industry who are fellows of my academy. They believe the crisis is going to be sooner than that. We are making the noise now because of the investment lead time in these things.

Senator BUSHBY—Even with gas.

Mr Laver—Gas turbine could probably be up and running—

Senator BUSHBY—How quickly?

Mr Laver—A couple of years, I would think.

Senator BUSHBY—And that would include the regulatory side and construction?

Mr Laver—Yes; most of them, particularly if they are already collocated with an existing generator so you can just hook straight into the grid and so on. Generally speaking, you can do those pretty quickly. They are more or less off-the-shelf type technologies. Nuclear would be much longer. Ziggy says five years; other people say 10.

Senator BUSHBY—We have had varying evidence on how long nuclear would take, but a lot of the time would be on the regulatory side of things.

Mr Laver—Yes. We have got to get a regulatory regime. We do not have any people, for a start. But the longer you have this political embargo on it, from whenever you are going to lift it—and at some stage inevitably, but not in my lifetime—it is going to be inevitable that we are going to have to move in that direction.

CHAIR—You should be a bit more optimistic.

Mr Laver—That is right.

CHAIR—Both about your lifetime and about the—

Senator BUSHBY—On that, though, it would be fair to say, would it not, that you would not disagree with the statement that, if the political decision is not to give the go-ahead to nuclear power being built, it would probably be prudent to put in place a regulatory framework where it was possible in case the decision was made to proceed?

Mr Laver—Yes. It is just stalled at the present time. If you talk to overseas investors, they are not interested in coming here to talk nuclear because they say, 'The government doesn't want us,' and that sort of thing. If at some stage an announcement could be made that we are not pro-nuclear but that we would at least be prepared to consider nuclear along with all these other technologies and may the most efficient, effective one win, it seems to me that we would have some chance—

Senator BUSHBY—That seems like a very logical perspective. But, even in the absence of going that far, it would be prudent, would it not, to actually create the regulatory environment and put in place what you need to have in place for a nuclear power generator to be built, even though the political decision may remain not to consider that at this point? That would remove some of the lead-in time in the event that a decision is made at some point.

Mr Laver—I think I would agree with that. I just cannot envisage how it would happen, particularly if it required significant investment to put that regulatory environment in place. I guess there is a nucleus of one through ARPANSA for Lucas Heights.

Senator BUSHBY—There is legislation at the moment looking into that.

Senator HUTCHINS—Thank you, Mr Laver, for coming in again. I wonder if I could ask for the Academy's opinion on fuel security. Do you think we are doing enough to invest in, or investigate, the issue of fuel security, not just for private vehicles but for road or heavy vehicles, whether they are buses or trucks?

Mr Laver—I think we should be doing more, particularly at the research end, because again the lead time is so long. The previous presentation talked about second-generation biofuels. We have certainly been advocating those. As soon as you have competition between energy and food I think we forget about it. But we have a lot of, if you like, lower quality land that is not used for prime agricultural purposes, which you could possibly grow some of these oil rich materials on. There is a lot of work going on. In South Australia there is work on algae, for instance. We have a lot of brackish water in different places. Again, the cost structure is not there yet. But there will be a learning curve. I think some considerable opportunities can emerge, providing we continue to work on the technology.

In our work on biofuels we did recommend to the minister the establishment of a biofuels institute, in the same vein as the Solar Institute, because there is a lot of fragmented work going on in Australia at the present time. I do not think you need a central direction on it, but you at

least need something that saves the effort being fragmented and duplicated. It would almost be a virtual institute—there would not be a great deal of people or anything, but it would perhaps have a little bit of grant money available. It would be more like a clearing house, particularly for government research grants and so on, in this particular area. I think there are some prospects there. The money does not add up yet, but if oil ever gets back to 150 bucks a barrel, we will certainly find it worth while.

There is some more work that can be done on agricultural waste and so on. If you are already harvesting something for another purpose, and you can use it for a biofuel, it seems to me that it has a lot of attraction; but there are a lot of drawbacks with it in terms of the mass you have to transport—it has very low density and these types of things that mean it becomes a significant cost.

Senator HUTCHINS—That is what I was going to ask you. I am just reading here that Mumbai is going to run all its buses on Hythane by 2050. They are talking in this article about converting the engines and manufacturing the engines. If we did go to these second-generation biofuels, what capacity would the heavy vehicles have? Would they be able to cart the 42 tonnes that they do now? Would we be able to have B-doubles and road trains? Would we be able to have double-decker buses? We were just talking about reducing the density. Is that essentially what we are looking at?

Mr Laver—No, biodiesel is almost completely substitutable for conventional diesel, so there should not be any great difference there. With the ethanol replacement of petrol there are some limitations, but if you walk through Sao Paulo or Rio the smell of molasses in the air shows you that you can use ethanol quite well. But the more sophisticated ones—butanol and so on—will potentially be very beneficial fuels.

Senator HUTCHINS—What was that one again?

Mr Laver—Butanol. It is more energy dense than ethanol, but it actually has very similar characteristics.

Senator HUTCHINS—Is that out of the biofuels—

Mr Laver—It can be a biofuel. It is a more complicated thing to produce. Again, some research is necessary. It can come from cellulous material. There is a lot of work being done. There are a lot of opportunities there. If we look far enough ahead to a world where the oil price is over $100 a barrel a lot of these will become quite attractive prospects. For a country like Australia, which is not self-sufficient in hydrocarbon fuels, it could be quite an attractive proposal.

Senator HUTCHINS—You do not see any evidence of investment in that area at the moment? Is it uncoordinated?

Mr Laver—Not at this stage, no, because there is no incentive. It all depends on the oil price. That does not mean that we should not be investing a fair bit in the research in Australian materials. At the present, they are talking about Jatropha, for instance, as a source of oil for biodiesel. Jatropha is a declared weed in Australia and probably is not something that we should

be growing here. But I do not know that we have looked at oil rich Australian native species. There is a problem with talking too much about genetic modification for foods, but if it is going to go into their petrol tanks people should not worry too much about the genetic modification of plants to increase the yield of oil from them. It seems to me that they are the sorts of farsighted things that we need to talk more about.

One of our favourites would be algae, but we have to get a zero off the end of the dollars. The Americans are doing a lot of work there, so we can piggyback on them; hang off their coattails. Warren Buffet is investing in a major project to do with extracting oil from the algae, which is difficult. You put a chemical into the algae, the thing dies and the oil floats to the surface and you just skim it off. That is the sort of thing that we should be keeping our eyes and ears open for for the future, because there is a long lead time. Unless we do the research now, we will not be part of it.

CHAIR—Thank you very much for your contribution to the committee.

[11.12 am]

WISEMAN, Mr Anthony, Commercial Director, AREVA Solar

CHAIR—Welcome. Mr Wiseman, I invite you to make a brief opening statement. Then we will ask you some questions.

Mr Wiseman—AREVA Solar supply solar thermal equipment known as compact linear fresnel reflector technology or CLFR. This equipment generates steam using the sun's energy and the required temperatures or pressures in use in power generation or industrial steam applications and is the best cost for performance solar thermal technology available. The predecessor companies to AREVA Solar were pioneers for the commercialisation of solar thermal technology in Australia, acting as a direct and indirect catalyst at all levels of the industry. While reaching overseas to secure private capital and to access international markets—most recently with the merger with AREVA—the businesses maintained continuous operations in Australia since 2002 and there is a strong local team working out of offices in Sydney, Melbourne and Singleton to drive the company's achievements into the future. AREVA Solar intends to deploy equipment in the Australian marketplace to supplement steam supply to existing fossil fuel thermal plants, which will either reduce their carbon footprint or increase their output for the same fossil fuel input, as well as to greenfields power generation plants, whether they be gas hybrids or exclusively solar thermal plants.

The benefits of deployment of AREVA's CLFR technology for Australia are not limited to the installation of renewable or low-carbon power generation. AREVA's CLFR technology has specific characteristics that drive a high level of local content and participation. The company has a track record of building Australian capability and export opportunities and we believe it is uniquely placed to play a major role in the continued development of a truly indigenous and sustainable solar industry embodying the innovation and can-do attitude and commercial astuteness for which Australia is famous. AREVA Solar has demonstrated a strong commitment to the training and development of its local workforce and conducts training supported by local accredited training providers and TAFE in such areas as plant operation, welding and fabrication skills, automation and robotics, quality control, OH&S, computer literacy and electrical testing. Many of the staff have also enjoyed the opportunity to employ and develop their skills overseas, particularly in the United States and Europe.

In comparison with other renewable power generation technologies such as wind or PV, the large construction component of a solar-thermal project drives a significant level of local employment. For projects using AREVA's CLFR technology this local content is further increased by the creation of a manufacturing facility as close to the project site as possible. The local manufacturing facility transforms easily transportable commodity materials, such as steel sections and flat glass sheets, into the simple fabrications which form the bulk of our technology. This strategy is enabled by AREVA's design philosophy to avoid the use of specialist components with high-capital manufacturing techniques that require a global manufacture centre overseas and expensive carbon-intensive transport. Instead AREVA is able to use familiar materials, such as concrete, steel fabrications and corrugated metal sheet, and existing local skills, including metalwork, welding and galvanising. Our emphasis on conventional steel

fabrications and construction techniques allows local suppliers to bid competitively and develop solar experience without heavy capital investment. The modular nature of the technology allows suppliers and constructors to progress rapidly along the learning curve, creating in-house know-how and production efficiencies which enhance their competitiveness for future work.

We believe that geographical hot spots of solar technology will develop in regional Australia around not only areas of high solar radiation and transmission connectivity but also local manufacturing operations and maintenance expertise. These hot spots will become self-sustaining by attracting and securing skills which will provide a competitive advantage and by enabling the creation of enhanced community facilities and infrastructure that have flow-on benefits for those regions.

The challenge for Australia is to foster the development of a truly indigenous and sustainable large-scale solar industry. The framework for incentivising investment in large-scale solar to develop the industry in Australia currently rests primarily with the renewable energy target. More recently, one project will be supported by the solar flagships program in its first phase. We welcome the recent proposed RET reforms and keenly await the government's solar flagships shortlisting announcements. In contrast to overseas technology providers with offshore manufacturing bases, the use of AREVA technology within the solar flagships program presents the opportunity for a home-grown technology with established local partners to continue playing a major role in the establishment of a strong and sustainable local solar industry serving both local and export markets. AREVA's CLFR technology has conservative ratings well within material limits and it is a very exciting technology development pathway that will secure an increasingly large proportion of the rapidly developing global solar power market because it is bankable, competitive and innovative. AREVA's CLFR technology represents the future of solar thermal technology.

CHAIR—Thank you very much, Mr Wiseman. This is in terms of the general question that arises in the context of renewable versus the conventional coal and gas power generation technologies. The argument is often put: does it enable us to have a sufficient baseload supply of energy moving forward given the demand? Others say maybe baseload is not as important because we should be looking at the way in which we can better manage our peaks and troughs. What is your sense of it? There seems to be a difference between PV and solar thermal in terms of the capacity to contribute to baseload power, but I would like you to explore that a bit for us.

Mr Wiseman—Our technology is able to be retrofitted to cost-effective thermal storage solutions that we have under development. That is more a longer-term proposition. In the near term I think that the close correlation between solar power generation and grid demand makes solar power generation on the Australian group most attractive for peaking operations. The thermal inertia involved with the CLFR technology coupled with a conventional turbine assists in the maintenance of grid stability, especially during transient events, where potential cloud cover comes over. But where natural gas is available I think the solar can be supplemented so that a hybrid configuration firms up that available capacity where required and extends the hours of operation. So until there is a more cost-effective solution for energy storage, I think hybrid approach is probably going to be an interim measure to being able to reach that baseload capacity, and it gives you the best of both worlds with the solar in its peaking operations and the firmness of capacity where it is required outside of those daylight hours.

CHAIR—You talk about longer term. When would solar thermal be available to contribute in a meaningful way to our energy security over the longer term? What are the timeframes that you are looking at?

Mr Wiseman—It depends on the cost structure you want to target. It is already available today through molten salt storage if you wanted to pay for it. That is a very expensive storage solution and I guess it is not a cost-effective way to approach particularly supplying off-peak power. The hurdle rates in the current market framework for energy storage are very high simply because you are using that capital investment to supply our power requirements when the price of that power is so low.

CHAIR—So what sort of cost structures would you be looking at? Obviously the challenge is to a reliable, affordable supply of energy, affordable being a bit subjective as a quantifier. What is your sense in terms of your capacity to contribute an affordable supply of energy into the mix?

Mr Wiseman—I think the shorter term is focused around energy storage which is cost-effective for anything up to three to five hours so that you can extend a plant's operation into evening peaks where it is required, especially on those really hot days when air-conditioning loads run into the early evening to cool down households. And in the longer term, perhaps five to 10 years out, the development of that technology will enhance its capability to provide longer hours of storage so that you can work up to anywhere between 15 and 20 hours.

CHAIR—Are there any particular issues that you would like to talk us through in relation to infrastructure and how you connect your technology to the grid?

Mr Wiseman—The technology we have generates steam directly which runs through a steam turbine, which is well understood technology, and it has no difference in its connection to what would be required for a combined cycle gas plant or even for a thermal coal plant.

CHAIR—You mentioned the potential to supply to the energy mix and you mentioned the environmental jobs that are created. Have you got some facts and figures around all of that that you might be able to provide, or that you have at your fingertips?

Mr Wiseman—Yes, I can. For a reference plant size of around 100 megawatts we would expect the duration of the project would last for somewhere around four years. There would be in the range of 540 jobs created over that time frame.

CHAIR—That is construction.

Mr Wiseman—Manufacturing and construction for the project, and then for ongoing operations and maintenance a further 20.

Senator McEWEN—Interesting technology. You say it is steam generation. Does it require water?

Mr Wiseman—Yes, it has a feed water that it uses to create the steam directly. That steam is then fed through a steam turbine and condensed so that it can go back through the closed circuit.

Senator McEWEN—How much water are we talking about? I am thinking of where we are going to put this technology in, for example, South Australia.

Mr Wiseman—Because in Australia we would expect that most of the plants installed would be air cooled or dry cooled, the top-up requirements to the feed water would be very minimal. So from that standpoint it is environmentally-friendly water.

Senator McEWEN—Can it run on fresh water and salt water?

Mr Wiseman—For the purposes of power generation the water quality would be treated on site, so it would be a very high water quality for that purpose. But it does not require significant volumes of water for cooling, so whatever water is being used it would only require a minimal top up for the losses within the system. It is effectively a closed-circuit system. It is not a user of water, so to speak.

Senator McEWEN—Okay, but it would extract water either from the reticulated water supply or from some reliable water source.

Mr Wiseman—Not necessarily. It could be trucked in. It does not require the significant volumes that would need a significant connection.

Senator McEWEN—It does not require significant volumes of water like nuclear does, for example?

Mr Wiseman—No, that is correct.

Senator McEWEN—You mentioned that one of your projects is being supported by the Solar Flagships program. Are you able to tell us what that is or hasn't that been announced yet?

Mr Wiseman—No, the Solar Flagships program is currently being considered for short-listing by the federal government. We have supported a number of consortiums in applications under that particular program as an equipment provider.

Senator McEWEN—You mentioned that some of your staff have been to the USA and Europe to look at projects. What projects have they been looking at and how translatable are they to the Australian situation?

Mr Wiseman—The original organisations that preceded AREVA Solar started in Australia. They sought venture capital funding, which was forthcoming from a range of venture capital partners in the US, and so we had a range of people who moved over to California to be able to continue development of that technology. In 2008 they built a new facility in Bakersfield, California, which was the first solar thermal plant built there in 20 years, and that is the research and development facility for AREVA Solar's technology. We used those learnings for the purposes of further deployment of that product and we also have an installation here in Australia at Liddell Power Station in New South Wales.

Senator McEWEN—Is that actually supplying power?

Mr Wiseman—It is supplying steam to the power stations so that they can generate power, yes. There have been other projects that the company has looked at in Europe, in Germany, and we have had staff who have gone over to Germany to assist with those projects. A couple of them are now back in Australia. So in both Europe and in the United States we have had interests and experience for the members of our organisation.

Senator McEWEN—But is it still mainly developmental stuff that they are looking at so far?

Mr Wiseman—No. We have constructed our plant in Bakersfield, California, which is an ongoing facility that creates electricity, and we have our other installation here in Australia. So we have a commercial product that is available through the development of those two sites.

Senator McEWEN—You said that the potential is there for local little power stations, so are you talking about this technology being viable for remote and regional Australia?

Mr Wiseman—The technology is best suited to a grid connection, simply because of its large scale. Remote mining communities, depending on their size, are candidates for this type of installation, but the grid would have to be backed up with other sources of generation so that, when the solar was unavailable for steam creation, the plant would operate on some other form. So you would have to have a natural gas connection, or it would have to be supported by, probably, diesel generation in a lot of those remote areas.

Senator McEWEN—Right. And I suppose that, like all tentative technologies, the lack of a grid in remote and regional Australia, connecting, say, Western Australia to the eastern states, is problematic.

Mr Wiseman—I think there are a lot of places in Western Australia that are capable of installing this generation—in particular, in the north-west or in the south-west systems. There are a lot of regions that are able to install these plants.

Senator McEWEN—Why?

Mr Wiseman—There is a significant enough network in those areas to be able to accommodate them.

Senator McEWEN—So they are big regional centres?

Mr Wiseman—Yes.

Senator McEWEN—Thank you.

Senator BUSHBY—Is AREVA Solar a private company or public?

Mr Wiseman—It is a private company. It is a French company.

Senator BUSHBY—It is a French company that has acquired the Australian technology—in a roundabout way, maybe?

Mr Wiseman—In a roundabout way, yes.

Senator BUSHBY—But the technology was developed in Australia?

Mr Wiseman—Yes. It was originally conceived here in Australia, through the research conducted by Dr David Mills.

Senator BUSHBY—Was that privately funded or was there any public assistance?

Mr Wiseman—I do not know the full details of it. He was at the University of New South Wales at the time, I think.

Senator BUSHBY—Okay. You say that there are projects up and running; it is viable technology now. Are you bidding for projects around the world where governments are looking to put in solar technology?

Mr Wiseman—Yes.

Senator BUSHBY—And how are you going with those? Are you finding yourselves competitive?

Mr Wiseman—Yes. We are getting commercial traction in a range of countries around the globe. We are looking at projects in the Middle East, North America, Australia and some other, emerging, countries.

Senator BUSHBY—It sounds like the approach generally is a very common-sense approach using familiar materials and local skills, and trying to avoid specialist components and those sorts of things, which would obviously keep the cost down.

Mr Wiseman—Yes.

Senator BUSHBY—Presumably that would help make you competitive against other providers of solar energy.

Mr Wiseman—Yes.

Senator BUSHBY—But is your technology also different from what anybody else has?

Mr Wiseman—Our technology has a more simple design philosophy.

Senator BUSHBY—That is patented technology?

Mr Wiseman—Yes.

Senator BUSHBY—So does that provide you with a competitive advantage?

Mr Wiseman—We think so, yes.

Senator BUSHBY—Does that translate, though, in terms of cost, in terms of the tenders that you are able to deliver, and, presumably, also in terms of the outcomes that you can deliver?

Mr Wiseman—Our view is that we are the lowest cost-for-performance technology available.

Senator BUSHBY—So, when you say cost for performance—is that per unit of energy delivered?

Mr Wiseman—Yes.

Senator BUSHBY—I would have thought that that would put you in a pretty good position.

Mr Wiseman—We think so, yes.

Senator BUSHBY—Really what I am getting at is: if everything is as good as you say—and I do not doubt that it is—to what extent is that actually being recognised by the investors in this type of energy?

Mr Wiseman—The recent merger with AREVA is a significant amount of evidence of the potential that they see for the deployment of our product. AREVA is very significant conglomerate, an international energy company.

Senator BUSHBY—And that is fairly recent?

Mr Wiseman—Yes.

Senator BUSHBY—And presumably AREVA will give you, I guess, the gravitas or the size, the standing and the credibility with major investors, be they government or otherwise, to actually advance things more quickly from here.

Mr Wiseman—Yes.

Senator BUSHBY—So would you expect that there would be a fairly rapid take-up? Do you have the ability to meet the demand? If you found that you were bidding for projects and—on the basis of the fact that you were more cost-effective for the outputs delivered—winning a lot of them, would you be able to deliver that?

Mr Wiseman—The merger with AREVA was about a month ago, so that bolsters the bankability of our equipment and particularly the end users being able to access non-recourse project finance. The result of that should be that there will be a greater adoption of our technology and through the competitive processes that we participate in we would expect to achieve success. The next question from there becomes the environment that is created. It is in a particular country for the purposes of incentivising investment in that infrastructure.

Senator BUSHBY—You do not see any disadvantages in the environments that governments are creating? You fit in well with that?

Mr Wiseman—Yes, we do. The question becomes the economics that are created by the frameworks in place. I do not think that our technology faces any different challenges in the current renewable markets in Australia than others, for example, where there is a low renewable energy certificate price or where there is a low energy price.

Senator BUSHBY—There has been a suggestion that the current renewable energy technology legislation in Australia favours the more developed renewable energy technologies, like wind. Do you find that in Australia?

Mr Wiseman—Yes, it does, definitely.

Senator BUSHBY—Okay. That is the kind of thing that you may also face elsewhere in terms of regulatory environments. Depending on what governments have chosen to do, it may or may not assist you in terms of your competitiveness with other forms of renewable energy. Within solar energy you think you are very competitive?

Mr Wiseman—Yes.

Senator BUSHBY—We have already discussed the baseload power. If things do take off for you and you start to do a lot more projects, will that have any impact in terms of providing economy of scale cost benefits?

Mr Wiseman—It does, yes.

Senator BUSHBY—So that may well lead, in the long run, to a lowering of the cost that you suffer in order to deliver the unit output of energy?

Mr Wiseman—It would be beneficial, I believe, yes.

Senator BUSHBY—So that may well, in the short to medium term, deliver a lot of cost savings and make solar energy more competitive with other forms of renewable energy?

Mr Wiseman—Yes.

Senator BUSHBY—On the water issue that Senator McEwen was asking you about, correct me if I am wrong but coal-fired technology is all about heating up water and making steam. So in a way you are doing that, only using the energy of the sun. It is basically the same thing. In the same respect that water is needed for coal or even for gas, you are using the sun's energy and replacing that for the energy that is achieved from burning coal.

Mr Wiseman—I guess there are two kinds of water use in any power generation facility—a steam thermal facility anyway. One is for the use to be able to create the steam that powers the turbine, and the other potential use for the water is to then condense the steam to be able to extract the energy through that process and send the lower temperature steam back to be heated up again. The water intensive component is in that condensing, because it is basically evaporated off. If you are using a dry cooling system, where the feed water that has come through is cooled down through a large fan structure, then it is not a water intensive process.

Senator BUSHBY—Okay. And that is what you are doing.

Mr Wiseman—Yes. That is what we propose.

Senator BUSHBY—The only other question I wanted to ask was about the fact that you avoid specialist components. Presumably some of your competitors in the solar industry do use specialist components. By using familiar materials, everyday materials, does that lower the potential output? If your competitors are using specialist materials, presumably it is because there is some technical advantage in doing so. By using more general materials, does that impact on your technical ability to deliver, or do the technical patented processes that you have overcome that somehow?

Mr Wiseman—Our performance for the same level of capital costs is higher.

Senator BUSHBY—So there may well be some technical advantage that your competitors have but you can produce more using the same cost of input per energy than they can regardless of that technical advantage that might occur by using specialist—

Mr Wiseman—Yes, that is our view.

Senator McEWEN—Mr Wiseman, you mentioned your participation in the Solar Flagships program. Does your development of projects in particular require any other government assistance, apart from the RET and that kind of regulatory thing? Do you get any other direct assistance?

Mr Wiseman—We do not receive any other direct assistance, no. The business case that goes into investing in the technology relies on the revenue streams that are available. Where the renewable energy certificate price is lower and there is a gap in the subsidy required for an investor to get their return on investment, obviously they would look to any funding means necessary, and if they were able to achieve some kind of government assistance I think that is the avenue they would choose. We are an original equipment provider so we are not a specific project proponent.

Senator McEWEN—Are some states of Australia better to operate in than others for a regulatory environment?

Mr Wiseman—From a regulatory environment, no, I do not think so.

Senator HUTCHINS—Some are more sunny than others.

Mr Wiseman—Yes, some have better solar conditions than others, but from a regulatory environment none of the states specifically provides large-scale solar incentives.

CHAIR—What is your response to the argument that has been put to us on a number of occasions that including technologies like yours into the energy mix will result in a significant increase in the price of electricity?

Mr Wiseman—It will be more expensive. I think that is the reality of renewable power. The CLFR technology produces its energy, though, at the peak times predominantly in the summer period when energy has its highest value. I guess that on a cost-reflective basis it should be valued as its contribution across that period, rather than as you would value baseload power in the market.

CHAIR—When you say it will be more expensive, have you or your company done any work to assess how much more expensive it would need to be to work for your technology? Are there some numbers around that?

Mr Wiseman—We have done a lot of work to understand the long-term cost of energy of our product, yes.

CHAIR—Is there anything there that you can share with us?

Mr Wiseman—That is probably commercial in confidence.

CHAIR—So it is specific to your company rather than specific to the technology as such. I am not asking you to reveal commercial-in-confidence information relating to your company, but if you had to give us an indication as to where we are now to where we would have to be—given that you have done a lot of work I assume you have a clear understanding of that. Where would we have to be, from a pricing point of view for electricity, to be able to afford that your technology, solar thermal, is part of the energy mix?

Mr Wiseman—I think that, in terms of its cost competitiveness with something like wind power, the technology road map that we have sees us competing with wind power in the short term.

CHAIR—What is the short term?

Mr Wiseman—In the next five years. As to what that does to the shared cost of energy in the marketplace, I am not really qualified to give that answer.

CHAIR—In terms of the price of electricity now and what it would have to be for solar thermal to be a competitive part of our energy mix, what sort of percentages are we looking at—50 per cent, 100 per cent, 10 per cent?

Mr Wiseman—It is a very difficult question to answer given that we have disparate electricity pricing across every region in Australia. I am not sure I can give you a blanket answer.

CHAIR—You are operating out of South Australia. You are focusing on the NEM, aren't you? There is one regulatory regime for the NEM now, isn't there?

Mr Wiseman—Yes, there is, but there are different prices across each state in Australia for power.

CHAIR—Given your earlier indication that you guys have done a lot of work, as a private company that is a significant factor in your decision making, I would have thought. But your

expectation is that the prices of electricity are going to be moving forward. So I assume that you have made some assumptions around that.

Mr Wiseman—Yes.

CHAIR—I guess I am trying to get an understanding as to what your assumption is in terms of the price of electricity in order for solar-thermal to be a competitive part of the mix.

Mr Wiseman—We make an assumption about the forward curve of the renewable energy certificates going forward, and we also make assumptions about the cost of energy going forward. There are a range of things that go into those assumptions, including the consumption cost of gas and the potential for a carbon pollution reduction scheme.

CHAIR—All of which would be seen to be driving up, I guess, the price of electricity.

Mr Wiseman—Yes.

CHAIR—In terms of the regulatory and taxation arrangements, is there anything that you think should be done by government that at present is not being done?

Mr Wiseman—I think the RET scheme could potentially, as has previously been said to you, recognise some time-of-day input. I think, as Senator Bushby said, the wind industry is favoured by the current structure of the renewable energy target, and wind power does not necessarily have the same benefits to the energy system as the solar-thermal industry does. So I think that is one area where there could be some potential improvement within that scheme. In terms of the regulatory framework, the RET is a very good piece of legislation to assist the renewable industry with its deployment. I also think it is well complemented by programs like the Solar Flagships Program.

CHAIR—So these are your key comments on it. One of the things that has been said to us by colleagues of yours in the broader solar industry is that one of the problems is that there is a lot of chopping and changing in the regulatory and incentives framework. Have you got any views in relation to that?

Mr Wiseman—I think the changes to 20 per cent for the renewable energy target were foreshadowed, so it should have been expected. On the implementation of the carbon pollution reduction scheme, I think there is a general perception in the marketplace that there will be some kind of emissions trading scheme or price on carbon. It is an inevitability. It just is a timing issue. On the sovereign risk arguments that have been put forward, I do not think we perceive any specific issues there resulting from the changes in the legislation. But if more certainty could be provided there would be a much better outcome.

CHAIR—Thank you very much for your contribution to the committee.

Proceedings suspended from 11.49 am to 12.02 pm

CHAPMAN, Mr John Clifford, Executive Director, Motor Trade Association of South Australia Inc.

CHAIR—Welcome. I invite you to make a brief opening statement and then the committee will ask questions.

Mr Chapman—On behalf of the MTA of South Australia, I would like to thank the committee for the opportunity to present our key issues which affect our members, in particular small and independent fuel retailers, commission agents and members who have fuel retail operations connected to their business and whose presence in the retail petroleum market is crucial to maintaining a fair marketplace which offers consumers real and continued choice. In brief, one role of the association is to raise awareness in the community of the significant contribution of the retail motor trade to the South Australian economy, with an estimated annual turnover of about $8 billion and giving direct employment to 30,000 South Australians. Another role is to express to government the interests and industry perspective on the issues, pressures and challenges faced by our members.

Today I summarise the concerns related to issues threatening the viable and profitable operations of members whose very existence is endangered in a market in which regulatory arrangements favour large retailers and big oil companies, enabling their domination and manipulation of the market. The first concern is the need for adequate arrangements for access to oil company terminals for all buyers at a competitive wholesale price. The current regulatory arrangements do not provide for that. The wholesale market for petroleum products in Australia is dominated by the four major oil companies, Caltex, BP, Shell and Mobil, with independent imports only accounting for a small proportion of the market. As a result there is very little competition in the wholesale market and the market is defined by the lack of transparency in determining the wholesale process of petroleum products. The government must recognise that, due to this lack of transparency, fuel retailers invariably become price takers and are unable to contest the price either at the terminal or on delivery to their service station. MTA believes that this lack of cooperation and transparency in wholesale pricing is not in the best interests of motorists or fuel retailers and service station operators. MTA believes that the introduction of true terminal gate pricing arrangements where costs incurred after the terminal gate are itemised and charged separately, and where access to terminals to purchase fuel at the terminal gate is available to all suitably qualified buyers, would significantly increase the level of competition and the degree of price transparency in the wholesale market.

The second concern is that both the wholesale and retail petroleum markets are highly concentrated. This concentration has led to a loss of diversity, a loss of competition and a loss of choice for consumers. The MTA strongly argues against the introduction of any mechanism which will reduce competition and result in a decrease of consumer benefits and believes the development of consumer policy within this and any other market should be based upon the principle that diversity and competition provide consumers with the best benefits. The ability of independent operators to compete against oil company and supermarket sites is restricted because of the inherent unfairness in terms of competition and costs and the potential of misuse of market power of the existing market, the removal of the sites and franchising acts and the

failure of the existing Oil Code and TPA provisions to reinstate the protections previously provided by these repealed acts.

The MTA is fairly committed to the adoption of regulatory reform which seeks to address the imbalances in the power relationship between small business and their big business competitors in the market. Predatory behaviour is not an uncommon occurrence in the marketplace; however, this is difficult to prove conclusively, as overloaded shoulders of independent retailers do not have sufficient resources to outmanoeuvre the corporate strategists nor to gain sufficient detail to substantiate a complaint, especially retrospectively, and are not provided with the necessary protections to speak out against such behaviour without fear of retribution. Nor does the regulatory structure exist that adequately protects small business from predatory behaviour.

Turning to another topic, the MTA is always looking forward and preparing for the future. Of relevance today is the topic of alternate energy sources and products. The MTA is well informed about the changing shape, provision of and cost of energy in this country. For example, MTA time and resources are being applied to researching the opportunities accompanying the introduction of electric and hybrid vehicles. We will shortly take possession of our first hybrid vehicle for training purposes with the generous assistance of the South Australian government. This vehicle will be converted to a full plug-in electric vehicle later in the year, using technology imported from the United States.

Our energy use is under constant review as an organisation which operates over sites and has about 550 employees in total. I am pleased to say that, in two weeks time, I am advised that we will become the third largest producer of solar power in this state, with the commissioning of our 100 kilowatt solar panel system, which is an integral part of our $2.7 million heavy vehicle workshop project. This is another project which has received generous support from the government—this time from the federal government.

We collaborate with industry to train the next generation of tradespeople, and MTA develops appropriate training courses to upskill current tradespeople and cater for the dramatic change in vehicle innovation and technology which is increasing at an exponential rate. One of the greatest challenges facing MTA members and the automotive industry is the recruitment and retention of highly qualified staff at a time when the impact of technological improvement on new vehicles is increasing at such a dramatic rate.

I would like to conclude by thanking the committee for the opportunity to participate today and welcome the opportunity to answer any questions you may have.

CHAIR—Thank you very much, Mr Chapman. Given his particular interest, I will pass on to Senator Xenophon.

Senator XENOPHON—Thank you, Mr Chapman, for your submission and for your presentation. You mentioned the issue of retribution in terms of people being afraid to speak out. Can you elaborate on that? What does the MTA say would be a legislative solution to that, so that people are able to speak out without fear of retribution?

Mr Chapman—In talking to a number of our members about particular issues they have when negotiating terms with the site owner or the oil companies themselves, they are quite

reluctant to actually go down a dispute resolution path because they just do not feel comfortable in terms of having the power to defend themselves and they are worried that in some cases due to lack of tenure they can be out with 30 days notice. So there is a real issue of the imbalance of power between the big oil companies and the big operators and our small independents. Putting myself in their situation, I can understand it.

In terms of a legislative solution, I think there are potential opportunities under the Oil Code for some strengthening, but the work that we have seen to date in the review of the Oil Code does not give us great comfort.

Senator XENOPHON—The government has been looking at the Oil Code for quite some time now, hasn't it?

Mr Chapman—Nearly two years, as we understand it, which seems an enormous amount of time to take to review it.

Senator XENOPHON—What time frame were you given to understand in which the Oil Code would be reviewed and the findings would be published?

Mr Chapman—We understand that it is due to be published at the end of two years, which is about now. But it has taken an extraordinary amount of time: 12 months to undertake a review. The draft was circulated. It raised significant concerns and our national body, MTAA, expressed on behalf of its member states the concerns with the tone of the review, which appeared more to protect the big oil companies and big operators in the process and not the small independent people. That seems a bit at odds with what the Oil Code was supposed to do in the first place.

Senator XENOPHON—Further to that, you have said that independent imports are only a small percentage of the market. You may wish to take this on notice: what is your understanding of the extent of independent imports we have in the country?

Mr Chapman—My understanding of independent imports is that there is one facility in Victoria. I am not aware of any others that have reasonable import capacity. That is one of the issues, because without that there is a lack of competition.

Senator XENOPHON—On the issue of lack of competition at the wholesale level there is the issue of Port Stanvac, which was closed down as a refining and storage facility. What is your understanding of the capacity that Port Stanvac would have as an alternative fuel storage facility that could lead to increased wholesale competition if the independent operators were able to access that facility?

Mr Chapman—There is no doubt, given the size of Port Stanvac and the deep sea port there, that if it were reopened as a fuel storage facility there could be tremendous capacity for competition. However, my understanding is that that is not on the agenda and the facilities are now so run down that it would be virtually impossible to achieve that without considerable expense.

Senator XENOPHON—So it is an opportunity lost, in your view?

Mr Chapman—In my view those facilities are there. I think the whole problem with Mobil typified the arrogance of the oil companies in terms of the way that they dealt with the state government. If I go back to a past life, I have seen it from another side, where the behaviour of oil companies in times of a fuel crisis was just appalling. They did not respond in any meaningful way basically until they were threatened by the Treasurer of the day that he would invoke his powers to take control of the supplies. Suddenly, their attention was on the issue at hand, which was a shortage of fuel. To see what happened later in the negotiations with the current state government and deputy premier probably did not really come as a surprise, but it is a disappointment when a state government that is dealing with a very large oil company shows, I suppose, very much an example of what our small independents face.

Senator XENOPHON—Do you think the state government could have taken a stronger line over the storage facilities at Port Stanvac?

Mr Chapman—It is always hard to know without seeing the various positions that were put. I think that the government possibly could have but, at the same time, without knowing the various documents that were in place, it would have been a challenge and the behaviour of the oil companies and, in this case, Mobil, I am sure would not have facilitated that outcome.

Senator XENOPHON—But it is your view that the state government has statutory powers that can put the oil companies under more pressure than they have been?

Mr Chapman—The government—and I am going back to the mid-nineties—certainly has power under one of the acts in terms of emergency supplies and securing supplies for the state. I do not believe that it extended beyond that. Certain processes had to be gone through to satisfy cabinet and, indeed, the Governor that it was necessary to invoke those powers. So it was quite a narrow set of powers.

Senator XENOPHON—Can I touch on the issue of wholesale competition. You said that there is little wholesale competition in the marketplace. What do you think should be done? I will roll these questions in together, and you can answer them as you will. What do you think could be done to improve wholesale competition? Does it involve legislative change? Do you think that, under its existing powers, the ACCC could take further action, or doesn't it have enough powers? Can you also comment in broad terms on whether the Petrol Commissioner ought to play a role in the issue of wholesale competition?

Mr Chapman—What we have argued for in the area of wholesale competition is transparency. It has been one of the key issues whereby, according to the way the system works, there are rebates and different applications of transport cost, depending upon who is buying from whom. The pricing structure is very murky and makes it very difficult for the independents to understand the market, let alone compete in it. The concerns that we have had in the past relate to the inability of our members to take advantage of what are clearly loss leader prices. This is where we see examples of predatory behaviour or, as some term it, 'competition' where a major will sell at a cost well under the terminal gate price. I know members who would have really liked to have filled up their fuel tanker at that site, because they could not buy the fuel for that price. They are paying much more but the current state laws restrict them from doing that.

Senator XENOPHON—It is only a jerry can full, isn't it?

Mr Chapman—From memory, it is 20 litres. So there is this conundrum in the laws that restricts trade, even at a retail level. If they are running a loss leader, surely they should not have problems with filling up a petrol tanker.

Senator XENOPHON—My final line of questioning is on the issue of the big oil companies being able to flog off fuel at below terminal gate pricing and independent operators not being able to avail themselves of that. Is it your view that to deal with that sort of thing it ought to be outlawed or, at the very least, people should be able to fill up an oil tanker at a service station? It is not really practical, though, is it?

Mr Chapman—It is not really practical and there are issues of safety. It is an example. If there were transparency in the process and, I suppose, access, then why shouldn't that independent retailer, if they were so equipped, be able to hire a tanker and go down to Birkenhead in this state and load up for that price via that retailer? They could say, 'Right, instead of buying 20,000 litres from your tanks underground, we'll buy it from down at Birkenhead.'

Senator XENOPHON—Are things currently getter better or worse in the marketplace as far as the independents go?

Mr Chapman—In terms of the marketplace, we have seen over many years a continued decline in our association membership in the fuel areas. Indeed, the bulk of our independent retailers are now in country areas. That has been purely because of the difficulty of competing in the marketplace, which is dominated by the majors and the two grocers, Coles and Woolworths. It is a difficult market. I have one member at the moment who is gathering information in relation to, hopefully, a predatory pricing issue. We are encouraging that member to do that. We have been disappointed with that level of the ACCC level where we have raised concerns and they have then asked us to go away and do the investigation. We are a pretty good and proactive—

Senator XENOPHON—The ACCC says, 'You get the evidence for us'?

Mr Chapman—Yes.

Senator XENOPHON—That is not your function, though, is it, to gather evidence for a prosecution by the ACCC?

Mr Chapman—That is a very good analysis. That was my view as well, and we had a very strident exchange of letters. By the time this sort of nonsense was going on, the world had moved on. We think the ACCC should be better resourced so that when we do raise issues or, indeed, when the public raise issues of predatory behaviour or queries of overpricing, the ACCC will have the resources to properly investigate.

Senator XENOPHON—Mr Chapman, are you in a position to provide the committee with details of those letters, even if the party does not want to be identified and it is just some flavour of the correspondence? That is my final question.

Mr Chapman—Yes, I could.

Senator XENOPHON—Even if the party does not want to be identified, just to get the flavour of the correspondence.

Mr Chapman—Yes. I am stretching my memory—this does go back a couple of years. It would have identified the original complainant, but I would ask that that be kept confidential.

Senator XENOPHON—Yes. Thank you.

CHAIR—Senator Hutchins.

Senator HUTCHINS—Thank you, Chair. My question is not on that issue, Mr Chapman. I do not recall you mentioning this in your submission, but how is your membership coping with the National Greenhouse and Energy Reporting Scheme? Have you had to confront that at all at this stage?

Mr Chapman—Not at this stage. My understanding is that our membership actually falls outside of the requirements in terms of size of business—I think it relates to that.

Senator HUTCHINS—Because you know that on 1 July the size of business is going to go down considerably; it will not just hit Qantas and others like it. It should go down. But there has been no particular approach by the association to have a view on it one way or the other?

Mr Chapman—No.

Senator HUTCHINS—Right. In relation to fuel and energy security—which, as you would be aware, is the basic reason for this committee's existence, among other things—aside from your obvious concerns about the oil companies and the retailers, are there any particular areas of fuel security you would like to bring to the committee's attention that you feel that the country is not facing, that we need to do better or that we need to act on?

Mr Chapman—That is a very good question. Our concern in this state relates to the security of supply, which has deteriorated since the departure of Mobil's refining facility. We run very close to the wire in terms of our supplies in this state. Generally, it is down to five to seven days. You do not need too much going on in terms of high seas and a ship getting delayed for it to cause problems. We believe it is an issue for government to look at. Generally, where there are refineries in other states, the supply runs 20-plus days. What we find here with our shortage of supplies is that at peak times, particularly at cropping time—either harvesting or sowing—we often tend to run short of diesel.

The proposition we put to all political parties in the lead-up to the state election was that there is a large amount of capacity within the existing service station network around the state that is unused, and it is unused because operators do not have the capital to keep their stocks up and at the same time do not necessarily want to be caught with high-priced stock when there are significant movements in terms of pricing at a wholesale level.

We think that there is a role for government to use that storage space and assist operators by underwriting the cost of that extra capacity. If, say, they have got a capacity of 100,000 litres but are currently running it at 50,000—I am just using very general numbers—the government

would underwrite the cost of taking it up to 100,000. If you multiply that by the various service stations around the state, we believe that that would increase capacity sufficiently to ensure at least 20 days supply. A lot of work would need to go into analysing that. Unfortunately, we do not have a lot of buy-in from the government or indeed the opposition to that proposition, but fuel security is an issue in this state.

Senator HUTCHINS—What you mean by 'underwrite'? Could you just expand on that for us.

Mr Chapman—We calculated, based on some figures provided by the ABS, that all vehicles in South Australia use 6,241,095 litres per day, which equates to the cost of $1.40 a litre as a round point to about $8,737,534 per day. If the government wanted to finance that as a 20-day supply, we worked out on a bankable rate of about 3.4 per cent that that would cost about $6 million annually. So, effectively, the government would borrow to buy that fuel up-front. It would sit there in the tanks. There would certainly have to be agreement but it would be sitting there and it would be turning over. The cost to government would the interest cost, or the cost of capital.

Senator HUTCHINS—And there would be the 20 days worth available rather than five to seven.

Mr Chapman—Yes.

Senator BUSHBY—So the advantage of that would be that you would fill up all the empty tanks sitting under service stations around South Australia, but the government would own the petrol that was in there?

Mr Chapman—Effectively, yes.

Senator BUSHBY—If a particular service station which normally only kept the tanks half full had them full at the government's expense, what would happen if, for whatever reason, they had a greater demand—say, there was a new operator or new marketing, or the service station down the street closed down and all of sudden they started using more petrol? How would that work in terms of repaying the government for the petrol?

Mr Chapman—In our view it would be a supply arrangement between that retailer and their wholesaler, and the government would sit there as almost a silent mortgagee.

Senator BUSHBY—So it would not necessarily pay up-front for the petrol that is going in; it would be more like an underwriter?

Mr Chapman—An underwriter is probably it.

Senator BUSHBY—What are you actually asking for in respect of terminal gate pricing? Are you asking for transparency or parity in pricing?

Mr Chapman—We are asking for both. In the first instance it is transparency. Because of the way the terminal gate price is structured you have a terminal gate sitting there, but underneath

that may be rebates related to transport or volume purchasing that you never see. That makes it very difficult as an industry to understand what is going on.

Senator BUSHBY—So you want to firstly understand what the prices really are—

Mr Chapman—In the first instance, yes.

Senator BUSHBY—If you just turn up once a month with a truck and say, 'Fill it up', do you maintain that you should have the same price per litre as somebody who turns up with a truck every day?

Mr Chapman—We maintain that in the appropriate circumstances there should be access, particularly where there is movement in the market. Independents should be able to compete on a reasonable basis, and at the moment they cannot.

Senator BUSHBY—I understand that, but transparency would not enable you a better understanding of what—

Mr Chapman—It would certainly give us a better understanding.

Senator BUSHBY—And it would also provide more information from which to better form arguments for pricing clarity.

Mr Chapman—Correct.

Senator BUSHBY—At this stage you do not have that option because you do not really know what is going on. You also discussed some of the legislative roadblocks in front of promoting competition, your example at the moment being that it is illegal to drive a truck in and fill up at a service station because of quantity limits. Presumably that is in South Australia only. Do you know whether that is also the case in other states?

Mr Chapman—I am not aware of whether it is in other states. Perhaps that is a question best directed to our national organisation.

Senator BUSHBY—And elsewhere. Are there any other regulatory or legislative regimes or frameworks that are actually inhibiting competition that you are aware of at the wholesale retail level?

Mr Chapman—Not so much at a retail level. There is a state licensing act but there is nothing that we are concerned about in relation to that. OH&S is obviously an issue if you are putting in new tanks. There are requirements there but there is nothing else at a retail level that we see as an impediment to expanding the market.

Senator BUSHBY—So there is nothing in place currently that you are aware of that makes it easier for the major oil companies and the supermarket chains to out-compete you as such?

Mr Chapman—No, except for their access to capital.

Senator BUSHBY—There are obviously a number of structural reasons but, as a legislator, I am interested in the legislative aspects. What can we do in a legislative or regulatory sense that would positively assist competition in the petrol wholesale and retail markets. You have talked on some when talking about the need to make some things better, such as the Trade Practices Act, with the ACCC taking more of an active interest in things like that. How could we make changes that will actually promote competition without imposing overly large regulatory burdens on business?

Mr Chapman—Firstly, it would be to flush out the oil code from government. One of the issues we face is this ongoing slowness, which makes it very difficult to get change. Nearly two years have gone by in this review process and we still do not seem to be any closer to getting a result, whether it is in legislation or whether it is budgetary, some resourcing for the ACCC—if that is the issue—to have greater ability to investigate examples of predatory behaviour rather than saying, 'You've got to come up with the evidence', which our small member is trying to do as well as run a business and, hopefully, at the end of the day make a dollar.

Senator BUSHBY—Yes. It is much harder for small businesses to be able to do those sorts of things, and large businesses have divisions that can take care of that.

Mr Chapman—That is right. I was quite serious when I said 'access to capital'. If you have got access to capital or finance as big business—and I have worked for one—you can do a whole lot more than when you are a small operator running one site or one workshop.

Senator BUSHBY—You mentioned earlier, before we started, that you had seen me in the economics committee. As an aside, the economics committee is holding an inquiry into small business access to finance, which will start next week. It will be an interesting one.

Mr Chapman—We will look forward to that because it has certainly been an issue for our members, and obviously we have seen post GFC a whole lot of changes there.

Senator BUSHBY—Yes, that is specifically what we are looking into. But let us get back onto the terms of reference for today. My apologies for that. Are you aware that the government has, through the COAG process, introduced a new consumer law regime? It does a lot of things, but I understand from an inquiry I was involved with that one thing under the new Consumer Law regime—subject to the states actually providing for it as they are supposed to under the COAG agreement—is that access through state courts right down to small claims courts will be available to remedies that are offered in the Trade Practices Act. Currently, basically you need to go to the Federal Court, and you need to have very deep pockets to run a Trade Practices Act action. I had some real problems with the overall Consumer Law in general, but one of the things that did appeal to me was the fact that under this new regime the benefits that are currently provided in the Trade Practices Act, Consumer Law benefits, will be available through state based dispute resolution fora as applied in each of the states. If that something that you are aware of?

Mr Chapman—No, I am not.

Senator BUSHBY—If my understanding is correct, and that was explained to me by the Treasury officials who were before me, I think that that could provide a whole new avenue for

small businesses such as those that you represent to have a much lower cost avenue of redress than they currently have.

Mr Chapman—I certainly hope that is the case, Senator, and not a case of the consumers having access to that but business not having access. That is what we have had difficulties with at a state level in the past.

Senator BUSHBY—There certainly are aspects of the Consumer Law that are only applied to consumers in the new regime, but as I understand it that is more to do with the unfair contracts side of it. But the overall Consumer Law regime that they are putting in place is supposed to, through the COAG process, lead to the same degree of access that you would have had through the Federal Court being available through lower cost state based courts. Hopefully that is something which is the case and will be delivered.

Mr Chapman—We will look forward to that.

Senator BUSHBY—That may well assist you with some of the issues that you have with the failure of the Trade Practices Act in the way it is applied, because theoretically there could be a lot more actions instituted to test some of the things that currently remain largely untested and to help define some of the terms that at this stage are a bit unclear.

I have one final thing to ask you. The heat seems to be out of the petrol pricing issue at the moment, largely because the international price of oil has more than halved since it reached peak a year or two ago. But at some point the international price of oil will go up again, and no doubt when it does go up it will go up dramatically and set some new record. What can we as legislators do now to protect consumers and small businesses when that happens? What regime or regulations can we put in place that will actually assist consumers and small businesses to protect them from profiteering and price gouging in the context of rapidly increasing international oil prices?

Mr Chapman—That is a very interesting question because it is such an international issue in terms of global pricing. There are the monitoring regimes and perhaps government's understanding of the buying cycles. It is very easy for the major oil companies to say, 'No, we bought that at a very high price so that is why the price is still high in Adelaide after the Singapore terminal gate prices dropped substantially.' There are some complexities in that. I am not sure there is anyone within the government that actually has a really clear handle on it because you have this issue of oil companies saying, 'We're not going to tell you exactly what we are doing.' There is that lack of transparency that comes through.

I am not sure I have the answer to that challenge for the federal government when you are dealing with the global market, but that is where one of the key problems is. Probably the other area is that the government can certainly be a major participant in terms of the development of alternative fuel and energy for the vehicle fleet.

Senator BUSHBY—Which reduces our reliance.

Mr Chapman—It reduces the reliance. I have touched on how we as an association are moving down the path of hybrid electric vehicle training. At the moment we are in this hiatus

where the oil price has stabilised to some degree but when world demand picks up I can see us rapidly moving back to prices of $1.50 heading towards $2. We need to position ourselves and our members to be ready for the change which invariably results when the oil price moves substantially skyward. I suppose that is part of the forward thinking.

It shapes our thinking in terms of what the service stations of the future are going to look like. I think you have had representatives from Better Cities appear before you. I read in the *Hansard* that there is an awful lot happening on various fronts. I am not sure what is going to emerge as the dominant technology, but I think electric vehicles certainly will have a future and hence the Prius we are getting will convert to an electric vehicle using plug-in technology. It is starting to come within the reach of not the average consumer but the upmarket consumer who wants to make a difference. Then you get the issues of when you are plugging it in, what sort of power it is: is it clean energy or not? I think in this state there has been a lot of forward thinking in terms of wind power.

Senator BUSHBY—It is not just an issue of wanting to make a difference. We had some evidence earlier today that, even using expensive renewable technology, using an electric car is about four times as efficient as a petrol car in terms of the energy going into. It uses about 25 per cent of the energy that a petrol car uses. So it is not even just a matter of making a difference, which obviously a lot of people want to do; it may also be the most efficient way of using personal transport.

We have had varying evidence and a lot of people have mentioned Better Cities. A lot of people are pushing for a lot of government investment in public transport, but there is also a countervailing view that, regardless of the need for more investment in public transport, which I do not deny, people like having the independence of having their own vehicle and being able to choose when and where they go, which will probably drive, as you say, more efficient ways of doing that, which may be electric, hybrid, hydrogen or whatever develops. Do you agree that in the longer term people will still want a personal form of transport rather than, on the whole, a mass move to public transport, even if it is made hugely efficient and more timely?

Mr Chapman—Absolutely, because of the size of our country and our population. We do not have the density to support the dramatic improvements in public transport that would be needed. I live a bit over 20 kilometres from the city centre of Adelaide and no bus goes past my front door. In fact, it is probably a two kilometre walk to the nearest bus. The cost of extending that public transport network to provide reasonable service is quite phenomenal.

Australians like their cars. I have never heard anyone come to me and say, 'I just love my public transport bus or train.' That may change. I think there is certainly going to be an ongoing role for the private motor vehicle because it gives people independence to go and do whatever they would like at a time they would like.

Senator McEWEN—I just want to go back to the issue of ensuring we have enough skilled workers in the motor industry in South Australia for developments not just with electric vehicles but alternative fuels and more complicated vehicles et cetera. Clearly your organisation is doing a lot in that regard, but what more do we need to do and what more do governments need to do to ensure we have a skilled workforce for the future?

Mr Chapman—Government can greatly assist us in terms of promotion of the trades to young people. We have been struggling to get the message across. It is not just our industry. In another role I am the Deputy Chair of the South Australian division of Group Training Australia. Members cover the various trades—building, automotive and other trades and traineeships. I think it is the promotion of the trades as being a valued contribution to society. I suppose it comes right through to the education network and working closer with industry to develop links that sometimes just are not there with the schools.

The government has recently had a number of financial benefits, such as Kickstart, which was a great boost to organisations thinking about hiring an apprentice. We think there are areas there in terms of the government grants to employ apprentices that would go a long way to making the apprenticeship system a little more attractive to young people as well.

Senator McEWEN—Do you have any sense of the lack of capacity in the system at the moment? Are we short by numbers of people?

Mr Chapman—In terms of the automotive area?

Senator McEWEN—Yes.

Mr Chapman—We face continual demand for mechanics, panelbeaters, spray painters and autoelectricians, which is a particularly tough one now. There are probably no surprises there. They have been listed on the MODL, which up until recently was the list for skilled migration. That is undergoing some substantial changes in relation to what skills will be recognised for migration. If I pick up the *Advertiser*, our trades are represented in the situations vacant quite prominently every Saturday. If I talk to our members they say it is an issue. We have been working with a number of people in terms of skilled migration. A number of our members have used that. Then there is training young people. We are trying to cover all bases. There is certainly still demand out there.

CHAIR—Thank you much for your contribution to the committee.

Mr Chapman—With your concurrence, I will issue some magazines which record my recent trip to the United States and which provide a bit of detail on electric vehicle work.

CHAIR—Thank you.

Proceedings suspended from 12.44 pm to 1.47 pm

SAMAN, Professor Wasim, Member, Australian Solar Energy Society

CHAIR—Welcome. I invite you to make a brief opening statement and then the committee will ask you some questions.

Prof. Saman—I mentioned that I work in sustainable energy. To me, sustainable energy is a combination of using energy wisely on the demand side—and this is why I am involved in research activities on energy-efficient appliances and appliances that use solar energy in a practical way, because I am an engineer—and, at the other extreme, looking at sustainable supply using available conventional and other resources We are looking at things like solar hot water systems and heating and cooling systems using solar energy, as well as conventional air conditioning, heating and hot water systems.

Let me start by saying that with respect to security and sustainability of energy supply, we are well endowed in Australia with both conventional and renewable sources of energy, and we have made good progress in harnessing wind energy in the last few years and we are starting to develop serious activities in both solar and geothermal energy supplies. We do happen to have some of the best resources in all three forms. I am not going to list the conventional energy supplies, which I am sure you are very familiar with.

Just to give you an idea, the Australian Solar Energy Society is a not-for-profit organisation which traces its history to the mid-1950s. Its primary membership is academics, solar related companies, R&D organisations, users and community groups, and it is dedicated to the promotion and adoption of solar energy and other similar technologies. The society believes certainly that we are currently heading in the right direction in adjusting the renewable energy target arrangement. The only industry call from that point of view is the fact that they have to wait until the beginning of 2011 before this commences, and it would have been a lot more convenient and would reduce uncertainty if this could start, for example, from the beginning of July.

Another good example of a program which is going to go off is the Solar Flagships program. It is certainly an excellent program, particularly in developing local expertise and moving to build large-scale solar energy generation capacity in this country. As a researcher I am particularly pleased about the fact that the Solar Flagships program has been linked with the research component. This research component is going to ensure that we have locally developed technology and locally developed industry in the solar thermal field and that we establish a leadership and lots of new jobs and export opportunities in the solar area. This certainly avoids the failure, for me, that we had with the wind industry opportunity, where most of the large wind farms are being built by international companies with a minimum of local content. The linkage of the research component and the research infrastructure with the building of the first two large solar power stations is going to guarantee that there will be a lot of locally produced intellectual property that will help us in the future.

There are two issues in relation to that. Some of you may be aware that there were 52 stage 1 applications for the two power stations, the results of which will be announced later this year, showing the world's and Australian companies' interest in this particular program. I wonder if

there is a need to consider other incentives beside Solar Flagships for some of the more serious applications. Two of the society's proposals are loan guarantee incentives for the companies and also the consideration of a feed-in tariff, which I will talk about probably a little later.

So much for the supply side. On the demand side we see plenty of opportunities for energy saving and cost saving for industry in Australia, and I think we are well behind Europe and some American organisations in making real savings and looking at, maybe, some carrots and sticks for industry to reduce their energy use. Certainly this has been demonstrated to reduce energy costs as well as improve their emission profiles. So putting a price on carbon, having some progressive reduction targets, might help in that process.

I will speak a little about the transport area because, as you know, oil is the resource in shortest supply. I believe that we need to do a lot more in terms of encouraging gas driven vehicles. We have plenty of natural gas and the technology is available. There is no reason why we cannot take leadership in this area. Also, I happen to believe that in the next 10 years electric vehicles will be the most expanding type of vehicle in this country. So encouraging industry to build more electric and gas driven vehicles, as well as obviously reducing the size and the fuel consumption of other vehicles, is a priority. The industry should be encouraged through legislation. I am very pleased that we are about to have local production of hybrid vehicles, but the next step is to look at plug-in hybrid vehicles where we can use the night-time excess electricity to charge some of our vehicles.

I will say a few words on the household area and then probably stop. I am happy to say that even here in Adelaide we are demonstrating that we can have zero net energy houses. We have the Lochiel Park development and I encourage anyone to go and see it. We at the university have been monitoring results in the last few weeks. Seven out of 10 houses we are monitoring are producing more energy than they are using, and the majority of them look like normal homes. They are being lived in by not greenies but normal people, and this is the way forward.

CHAIR—What is the description of normal people?

Prof. Saman—I mean the 99 per cent of Australians, as opposed to the one per cent. I am sorry—

CHAIR—It's all right. Fair enough.

Prof. Saman—These are some of the comments we get from people who go and visit Lochiel Park. They say, 'But they look like normal homes and they have living rooms and plenty of space.' But they can be designed and built, they can use energy efficient appliances and they can save both energy and water. We are monitoring the results and they are showing that very clearly. So there is a lot to do in reducing energy use, certainly in new housing, and I believe we need to go a little more quickly in terms of regulation of higher energy efficiency houses, keeping in mind that the cost does not blow out. Again, we have some data which show that you can do a lot for little cost.

The other issue we are very pleased about is the mandatory disclosure of the energy rating of housing which is going to take place next year, because at least that will give people some incentives to reduce their energy use and water use. I am very pleased about many of the

programs at the moment for reducing energy use in existing housing, despite the difficulty that we have seen in the implementation.

In terms of priorities, I think we do need to have a price on carbon in this country. Industry are waiting for clear signals from government regarding the price of carbon because they are not sure how much carbon value to factor in.

The second area is the national gross feed-in tariff that we badly need in this country. At the moment the renewable energy targets are great but they do not discriminate between different renewable energy supplies, and this is an issue. It is too early in the piece to decide on the winners. I have recently seen in Ontario a feed-in tariff where there is a difference in the value given, between 80c and 10c, depending on the source of the renewable energy, so we can discriminate between different technologies and develop them at the particular times for the future of the country. I will stop there, thank you.

CHAIR—Thank you very much, Professor. What are the things that we should be doing now that we may not be doing in order to maximise the opportunity for solar energy in particular, but any of the renewables, to come on stream as a significant contributor to our energy mix moving forward? Are we going in the right direction or are there things that we should be doing right now that we are not doing?

Prof. Saman—There are two levels there. One is the small-scale level in housing and industry. Many of the current policies of encouraging solar hot water, for example, and solar PV are certainly being quite well accepted by the community and there is probably pressure for more funding to encourage that. I believe industry has a lot to do and needs more encouragement to make use of, for example, solar heat. There is a lot of heat used in industry which could be cheaply produced by solar energy, but that is not happening and not encouraged sufficiently, and also what has to be kept in mind is the cost of other alternatives. For example, there are lots of opportunities for cogeneration and trigeneration, particularly in industry where we use gas for the provision of electricity as well as heating and cooling. That is quite an important aspect that seems to fall between the cracks at the moment. On the larger side at the moment we are into household sizes and the solar flagship program, which is hundreds of megawatts, but there are lots of areas in the middle which we could help encourage, particularly for use by industry or for small communities.

CHAIR—In terms of the reliability of energy supply, there are two main arguments put forward. One is that renewables are all great to help contribute to manage peak demand but cannot really provide reliable baseload power. I would be interested in your comment on that.

Prof. Saman—Peak demand is a particularly important issue. In South Australia we are the first to suffer from it; certainly we have had a number of blackouts in heatwaves. There are a number of ways to respond to peak demand. The biggest contributor to peak demand is air conditioning. There is no reason why we cannot accelerate the minimum performance energy standard for air-conditioning systems to make them we use less energy. There are many products available around the world which use probably half the average energy used in air conditioners in Australia. They are slightly more expensive but they do, in the medium term, save money and energy and reduce the demand. That is one aspect.

The other aspect is generally to use energy efficient appliances. The use of photovoltaic electricity may not coincide precisely with the time of the peak but it certainly reduces the peak. The peak demand we are demonstrating in some of the new housing developments here like Lochiel Park is probably a third or a quarter of the peak demand for typical houses because they use energy efficient appliances, including energy efficient air conditioning, solar PV and solar hot water. So there is a lot that we can do.

One of the issues there which I have faced as a researcher is that usually this also coincides with reducing the total energy use, so we end up reducing the total energy use as well as the peak demand. Electricity suppliers do not like the reduction of the total energy use. They are quite happy for the peak demand to go down but not for the total energy consumption to go down. That is a bit difficult.

CHAIR—When you say reduced total energy use, what you are really meaning is not growing energy use as fast as we otherwise would. Isn't that so?

Prof. Saman—Precisely.

CHAIR—In the context of a growing population and growing economy, energy demand is going to continue to go up. The question is whether, by maximising efficiencies and by doing as well as we can with renewables, we can (1) reduce the level of growth and (2) supply some of that growth by different means. I see you are nodding.

Prof. Saman—Yes. I think this is one of the biggest problems. Energy efficiency plus renewable energy can do a lot to reduce peak demand.

CHAIR—I think we would all agree with that.

Prof. Saman—There are huge generation and transmission costs that we can reduce as well as outlays, for infrastructure for transmission, that can be saved if we use energy efficiency and locally supplied renewable energy.

CHAIR—There is much more that we can do and there is much more that we should do. We should do it as well as we can in going down that path. However, once all of that is done energy demand is still going to continue to go up. There will still be a growing demand for baseload energy, I would suspect. You nod so I assume you agree with that proposition.

Prof. Saman—Yes.

CHAIR—So once we have reached the full potential that can be reached with energy efficiency and once we have reached the full potential that can be reached with renewables like solar, wind et cetera, how do we supply an increasing need for baseload power?

Prof. Saman—I am glad you have asked this question. At the moment we are involved in a small solar thermal electricity generation project in Whyalla. I do not know if you are familiar with it. You might have heard about it this morning from my colleague Keith Lovegrove. A part of this project is solar energy storage, solar heat storage, which is possible with large-scale solar thermal energy plants. This technology is being demonstrated right now in Spain, for example.

The best option at the moment is to store energy for a few hours, and certainly the electricity providers say that it is about the first hour after the peak appears and that a quick response to that is very significant. Certainly the technology is available. We need to grow it in this country, and we are doing that in terms of building knowledge and real technology and doing demonstrations in solar thermal storage. As a university we are working on that right now.

CHAIR—So your proposition is that moving forward a combination of renewables as we know them and energy efficiency and baseload solar thermal power would be enough to meet—

Prof. Saman—And geothermal is another area where you can have baseload.

CHAIR—You can but it is not really available at this point in time on a commercially sustainable basis.

Prof. Saman—Geothermal is moving in the right direction. But as for solar thermal without storage, certainly there are plenty of examples in the United States since the 1980s—and it is still working. In Spain there have been a number of 50-megawatt projects which have been finished, are working and include storage.

CHAIR—I have been reading that your organisation does not support nuclear energy. What is your main objection to nuclear energy as another energy source as part of a diversified mix?

Prof. Saman—Let me give you my personal view. I think it also reflects the Australian Solar Energy Society's view. For an energy supply to be accepted it needs to be economically, socially and environmentally acceptable. Certainly we believe that there is a big question mark over not only the environmental aspects of nuclear energy but also the economics of nuclear energy. If we look at the programs for new nuclear power supply around the world, we find very few of them—I almost could not find any—which run on a truly commercial basis now. They do need support from governments or other organisations.

CHAIR—Is that different from solar and wind?

Prof. Saman—Yes, the difference there is that probably our circumstances in this country are a bit different from, say, China's or India's, where there are large populations that need plenty of energy in small areas. In this country we cannot build one large nuclear power station and supply the whole country. We need smaller sized power stations and certainly solar, geothermal and others are more appropriate. Also public acceptance of nuclear energy is another important factor. This is why I personally do not believe that in my lifetime there will be a lot of nuclear power stations in this country, even though this state is the largest in terms of nuclear fuel reserves.

CHAIR—Not a lot. One has to expect that one day there might be a few others. I think the difficulty is getting the first one, I suspect.

Prof. Saman—A nuclear power station?

CHAIR—Yes.

Prof. Saman—We do need very large power stations in this country, like they do in other countries, so the size of nuclear power stations is quite an issue here and it is more appropriate for larger countries. That is the point that I am making. Certainly this would make the economics—especially considering the safety and environmental cost of nuclear—probably cost prohibitive. Solar and geothermal will end up in the long run being more economically affordable for this country. I certainly look forward to the day when not only will we be exporting uranium but also we will be exporting solar produced fuels or energy supplies to other countries. We have the resources here. They do not have them in Europe or many other locations in the world. So why not use them?

Senator HUTCHINS—Professor, in your opening statement you spoke about household energy costs, regulation and sensible costs. You said there was some data available to support the position that you were putting. I wonder if you could expand on it for us.

Prof. Saman—Certainly. As a part of the Lochiel Park green village development, the University of South Australia has been involved not only in helping to develop the environmental guidelines and in working with the developer on the type of houses being built and advising the households but also in a detailed monitoring program. We have 100 homes that will be monitored minute by minute as to their energy and water consumption and their photovoltaic electricity production. We have 10 homes where we have detailed monitoring of every single appliance: how it is performing and how it is being used and how much electricity or gas or water it is using. So some of this data is beginning to be gathered.

Senator HUTCHINS—Is that available to the committee?

Prof. Saman—Of course.

Senator HUTCHINS—If we could get a copy of it—

Prof. Saman—First of all, the householders have, in their own homes, monitors whereby they can see what they are doing and how they compare with others. That helps them find out, for example, if there is a leak somewhere or if there is a light that has not been turned off or if their daughter has left the shower on.

But also the intention is to have detailed monitoring results shown and used. Indeed we have been involved in the rating methodologies, in the national rating of housing with a star rating. We have used some of our previous monitoring results for other housing developments in adjusting the rating system. I will be happy to send you some of the initial results for Lochiel Park. I do not know whether to send them to the secretariat.

Senator HUTCHINS—Send them to the secretary, yes.

Prof. Saman—Sure. We have got results for a few months now, but the intention is to continue the monitoring over three years. We will be happy to keep you abreast of that, and I will be happy to send you the initial results.

Senator HUTCHINS—I understand the society has a preference for the types of energy and fuels we should use. But should we be open-minded in relation to any sort of energy or fuel that comes along, particularly in light of pressure to reduce our carbon footprint?

Prof. Saman—I am an engineer and I am certainly open-minded about all conventional and other forms of energy. As I said, at the end of the day the economic cost and the social acceptance as well as the environmental aspects need to be considered. Certainly triple bottom line analyses need to be made before we decide on the choices. Having said that, I believe that in the future we are going to be relying on a cocktail of resources, starting with coal and maybe finishing with solar, wind and geothermal. Certainly by 2020 or 2050 we will have a substantial portion of our energy supply using low-polluting energy supplies. I believe that economically as well as environmentally and socially they will provide the best option.

Senator BUSHBY—Thank you, Professor Saman, for your assistance today. We have already touched on some of this stuff, but I just want to clarify a few things in my own mind. We had some evidence this morning which included a graph showing that the projected demand for electricity in Australia would continue to increase over coming decades and that the existing electricity generators are going to have a diminishing ability to meet that demand. So, while the demand is going up, what they currently can supply is going to fall down.

Prof. Saman—Yes.

Senator BUSHBY—So there is a big triangle shaped need for new energy generation over the next four decades. To a significant extent, clearly renewable can and will deliver a large chunk of that. I think Senator Cormann was asking you about how else we can meet that. We had evidence today and we have had evidence before indicating that renewables are probably only capable of delivering about 20 per cent of our overall energy needs, and that is because of the variables in terms of the ability to deliver in a baseload fashion and timing and the variables of wind and sun and so on and the challenges of storage, which you have already touched on. Do think that we can go over 20 per cent?

Prof. Saman—I am pretty certain that already some parts of the world have gone over 20 per cent. The 20 per cent is probably the limit many electricity authorities talk about with regard to just using wind as the alternative supply, keeping in mind the uncertainty and variability of wind. But, if we integrate geothermal and solar with storage, the issue becomes immaterial and there is no reason why we should stay with 20 per cent. The difficulty is in controlling the electricity supply and making sure its quality is acceptable.

Senator BUSHBY—Which is where smart grids and things like that come into it.

Prof. Saman—Yes, but the biggest challenge is with wind, and this is why maybe 20 per cent wind capacity is about the limit that many kinds of infrastructure can cope with. But you can add particularly solar thermal, solar PV and geothermal—and geothermal has no limit whatsoever in terms of its steadiness of supply.

Senator BUSHBY—It certainly has that. That has potential but, as discussed, it is not proven and commercially available yet in terms of providing baseload power.

Prof. Saman—No, that is true, but solar thermal with storage—and we are talking about a few hours storage—is working, and if we are serious about using it we need to trial it a little more quickly and put in some funding. I am not saying it should be as much as we are putting into carbon capture and storage, but we need to quickly move in that direction, and certainly some of the activities hopefully associated with the solar flagship will make that happen and we can demonstrate it.

Senator BUSHBY—You highlighted that we need to put funding into it to make it happen and to happen more quickly. But even with funding to make it happen and to happen more quickly, it is going to be a more expensive way of generating electricity than what we have enjoyed in the past when we have not looked at the triple bottom line, as you mentioned, but what consumers will pay in the absence of subsidy. It will be a higher form of cost for electricity.

Prof. Saman—You are absolutely right.

Senator BUSHBY—So it is a cost that you pay in return for the benefit that you get.

Prof. Saman—But I guess this will all depend on the price of carbon in the future. Many of the proponents of renewable energy used in large quantities are showing figures that suggest that even with storage if there is a price of carbon of $30 or $40 a tonne there will be parity or there will certainly be competition.

CHAIR—But when you say it will be based on the price of carbon, that is really based on the assumption that the cost of electricity is going to go up to a certain level where solar and others become competitive. So when you say 'parity' it is parity because of an artificial additional cost that is added into the system, isn't it?

Prof. Saman—Yes, but I think that Australia cannot be away from the rest of the world—

Senator BUSHBY—The net effect is that electricity becomes more expensive, regardless.

Prof. Saman—Electricity is already going up in terms of tariff and it will continue to go up.

Senator BUSHBY—And building into it a price of carbon or, alternatively, moving to some of these other renewable energies, will actually involve a higher cost. That is unavoidable really.

Prof. Saman—This is why I started by talking about the need to use energy more wisely. Again, we have done several studies showing that we can reduce our energy bills in terms of households if we use the right energy-efficient appliances and have the correct housing design. We can use less than half the energy we are using now and, consequently, end up gaining rather than losing in terms of the power bills.

Senator BUSHBY—Coming back to the gap between current energy generation and what we all need to meet demand—and I asked some questions about this this morning—even with energy efficiency it is still going to go up.

Prof. Saman—Of course.

Senator BUSHBY—There will still be a decreasing ability for existing generators to supply energy and an increasing demand. There is an issue of timelines. You have acknowledged that geothermal and solar thermal to some extent—and certainly the storage side of solar thermal—are not yet capable of providing today the baseline need. In the short to medium term before those technologies are developed to the extent where that is possible, as that gap becomes evident, what do we do? Obviously nuclear, if we wanted to do that, is a long-term option anyway; it is not something that you can do quickly. We have had evidence this morning that you can get gas, which is a low-emissions technology but still a CO2 emitter, up and running in about two years. Is that the sort of thing that we need to do—

Prof. Saman—Certainly, as an intermediate option gas is going to grow very quickly in terms of its use for large-scale energy production. But also to satisfy peaking demand it has got a large role to play in the next maybe five years.

Senator BUSHBY—You mentioned you are an engineer. Are you aware of what level of interest there is in investment, particularly in the gas side of things? I am thinking from the energy security perspective of that growing gap between energy supply and demand and the ability to meet that in the short to medium term.

Prof. Saman—From my point of view, the biggest issue facing the electricity industry at the moment is having some clear direction from government as to what the price of carbon is likely to be before they make any decision regarding what types of power stations they should be building. I think everybody agrees that there is an urgent need to start building new power stations, but this uncertainty makes a big difference to what direction they are going to end up going. Certainly in the last few years we have seen a lot of small developments just to cope with the peaks rather than commitments to larger developments. They are simply sitting and waiting for a clear direction.

Senator BUSHBY—I hear what you are saying about the need for certainty, but if that certainty does not arrive and no investment decisions are made then that could actually be a concern for our future.

Prof. Saman—Very much so.

Senator BUSHBY—I have one final question. You mentioned oil and the need to encourage more gas powered vehicles and so forth. We heard evidence this morning about using solar thermal power to produce liquid from coal. What do you think of that idea?

Prof. Saman—I welcome this idea, but I do not think it is going to happen in the next five to 10 years. It is certainly something for us to work on for the future but it is not something which has been demonstrated in a big way and it needs a bit more work.

Senator BUSHBY—Yes. According to the evidence that we had this morning, it would certainly be a lower emissions way of making use of the coal reserves that we have and ensuring liquid fuel security for the longer term and maybe some exports.

Prof. Saman—Yes. It is a good medium- to long-term solution but not an immediate solution.

Senator McEWEN—With regard to geothermal, how many years do you think we are away from it being viable or proven?

Prof. Saman—You are probably aware of the huge interest and investment in the geothermal area, and there is no reason why it could not be viable in five years in a big way. Probably you would have heard that the biggest hurdle at the moment is infrastructure and the grid connection, if we are going to produce it in large quantities. But as a technology I do not think there are many big hurdles left.

Senator McEWEN—Right, but we will not get investment in the infrastructure unless we have certainty about carbon prices. Is that what you are saying?

Prof. Saman—Yes.

Senator McEWEN—You mentioned Lochiel Park, which is one of my favourite places. I have been there many times and I should have suggested to the committee that we go there. But that development is a combination of effort from federal government, state government, local government, universities, and builders and developers. The results are fantastic, but is it translatable into a more commercial setting? Are we going to be able to develop commercial areas of the CBD utilising some of the technology that has been so successfully implemented at Lochiel Park?

Prof. Saman—The development is being built by commercial organisations on a commercial basis and there is no reason why it cannot be translatable. Are we talking about commercial buildings or housing developments?

Senator McEWEN—I was talking more about commercial buildings.

Prof. Saman—There is a whole host of activity in the commercial building area. We probably do not have a lot of the best buildings in South Australia, but there are a number of buildings around Australia which have demonstrated similar sustainability credentials which again can be translatable. As an engineer, I believe some of the issues there are not technology related but social barriers. People are used to doing things in a particular way and it takes them time to change the way they do things. The technology is available.

Senator McEWEN—There is some government subsidised housing for people in Lochiel Park, but overall the houses there are not that much more expensive than other houses being built in housing developments. Is that right?

Prof. Saman—They are certainly comparable in terms of overall cost. They are on the higher cost side, but there will be some social housing also incorporated—as you probably know, if you know Lochiel Park—and that housing will use the same environmental guidelines.

Senator McEWEN—Are any of the technologies being used there readily adaptable to retrofitting houses?

Prof. Saman—Some of the concepts, certainly.

Senator McEWEN—Do you know which ones?

Prof. Saman—There is the basic idea of reducing energy use for the house, water-efficient appliances, solar hot water and PV, some clever technologies to control the total demand so that if it exceeds a certain amount, unnecessary things or not high-priority things get turned off by themselves, and so on. The technology is there. It is obviously harder to incorporate everything into older housing, but we have over eight million houses in Australia and we do need to do something about reducing the energy use, and there are lots of things we can do.

Senator McEWEN—You mentioned the Solar Flagships program, which is a great program, and you said there were 52 applications. Two got picked up, I believe. What have we lost in the other 50 applications? What technologies and opportunities are there that we really need to make sure are supported somehow?

Prof. Saman—This is the issue. First of all, there are lots of consortia of international and local companies which have come together to put a bid together, so there are lots of great partnerships and that is one opportunity we will be losing. If we think in terms of the technologies, at the end we are going to pick one solar PV technology and one solar thermal technology, and we call that the winner, but as you probably know there are four or five competing solar thermal technologies, with or without storage, and we are going to pick up only one. So there will lots of opportunities for other technologies and other expertise that could be built but they will have to wait for subsequent rounds to make them happen.

Senator McEWEN—Thank you.

CHAIR—Thank you very much, Professor Saman, for your contribution to the committee.

[2.33 pm]

BYRNE, Mr Mark, Policy and Data Officer, UnitingCare Wesley

HENLEY, Mr Mark, Manager, Advocacy and Communications, UnitingCare Wesley

CHAIR—Welcome. I invite you to make a brief opening statement and the committee will ask you some questions.

Mr Henley—Thank you very much for the chance to present. We understand that the world has changed a little bit since we last presented to you. I just wanted to note very briefly that UnitingCare Wesley Adelaide is one of about 400 UnitingCare Agencies across the country. We are a reasonably large service based organisation, so our involvement with energy is through the lens of energy affordability, particularly as informed by our financial counsellors who have arguably the longest-running financial counselling service in the state. We provide energy audits and we have also had experience in the past with running a program called Energy Friends, which is a state government funded program, but that was pulled back.

Currently our formal relationship is with Origin Energy. We provide energy audits at their direction. I am also on various advisory committees to consumer groups and on the customer reference group for the Australian Energy Regulator. That is briefly our background. Perhaps Mark will start the ball rolling by talking about one of the tensions we wish to discuss, which is the broad question of climate change.

Mr Byrne—This is the context of our submission. We are not asking you to do an easy job; we are asking for a hard job, because we are specifically addressing competing interests here in terms of low-income people and the disproportionate effect of energy prices on low-income people but also the imperative for global action on climate change. Our position in the Uniting Church is that, informed by the national academies of science around the world and the research organisations—CSIRO and others—around the world, climate change is a serious problem. This assessment is informed by converging lines of evidence that have been subjected to unprecedented scrutiny. It is in this context that our submissions are made in terms of the need to do the dual role of respond appropriately to the needs for global cooperation on climate change but also address the potentially regressive nature of rising energy costs.

Mr Henley—I will pick up on that effectively regressive nature of utilities generally by referring you to the group of four charts we have just handed out. The first graph, the one at the very front, simply looks at two different measures that are allocated by income quintile. This data is based on the ABS's household expenditure survey. Regrettably, this is the most recent data; the household expenditure survey is only conducted about once every six or seven years, so this is 2003-04 data. The next household expenditure survey, according to ABS, is due out late this year, so we will be able to update this then. Until then, this is the most accurate, solid data.

If you look at the columns in the reddish colour, this graph shows that, nationally, in 2003-04, the poorest 20 per cent of households were spending, on average, eight per cent of their disposable income on electricity, whereas the highest quintile was spending about one per cent

or a tad over, on average, per household on electricity. Yet if we look at actual energy use, which is the line there, we find that on average the poorest quintile was the lowest user of electricity and the highest quintile was the highest user of energy. This does two things. It perhaps counters the view that low-income people are paying too much for electricity because they are not effective users of energy. I think it shows that they are the lowest users of electricity. But it shows that, because electricity is a relatively flat charge—it is a fixed price in terms of units of use or price per kilowatt hour—it means that low-income people are paying dramatically more as a percentage of their income. So that is the regressive nature of electricity.

If we turn the page, we have simply pulled apart petrol use here, and this is for Adelaide only. We have done exactly the same thing—looked at the percentage of weekly income going on electricity spending, which is the columns, and the line is the actual spend by quintile. Although we have a bit of a blimp with the middle quintile where actual spending is higher than the fourth quintile, the rest of the picture is much the same. Similarly, the next graph, which is for country South Australia, shows perhaps a greater tension between affordability of petrol and the amount of money actually spent. So, again, we see the poorest 20 per cent of households spending upwards of nine per cent, on average, of their household income on petrol but only spending a fraction—less than a half—of what higher quintile users are.

The last graph, on the fourth page, is a different measure. It is a measure of financial stress. Again, this is a standard ABS measure. There are eight measures of financial stress measured by the survey. The column on the left of each group is for the poorest 30 per cent of the population—not quintiles but the poorest three deciles, the poorest 30 per cent. In the second column along the measure is 'cannot pay electricity bills on time'. Over 40 per cent of the poorest 30 per cent, or one-third in round numbers, of the population are not able pay electricity bills on time. Interestingly, nearly 20 per cent of the whole population are unable to pay electricity bills on time due to inability to pay reasons. We see that energy affordability is in fact the most common measure of financial stress.

We have attempted to update these figures to get some sense of where things are up to now. The bottom line is: we are suggesting that the poorest quintile would now be spending on average between 11 and 13 per cent of their disposable income on electricity. Use is relatively consistent with other groups as before. The other point we make is that the projections are that the price of electricity will pretty much double over the next three to five years, irrespective of any carbon costing. Keep carbon out of the picture and electricity prices will roughly double in the next three to five, three to six years because there are pressures in each level of the energy price tag.

We suggest that that combination means that the poorest 20 to 30 per cent of the population within five, six or seven years are likely to be paying something like 60 per cent of their household disposable income on the combination of housing and utilities—essential services—of which electricity would be one of the major factors. We are saying that, on top of all the other issues that this committee is looking at, we have a real issue with energy affordability. I want to highlight that issue, and we will come back with some comments a little later on. We are now moving into: what are some of the things we might be able to do to start addressing this rising affordability crisis?

Mr Byrne—I will just hand out this submission. This is some evidence I have put together today, addressing the broader questions but in particular transport, transport poverty and transport as an issue of social inclusion and social health. I draw your attention to page 6 and 7. If you open to those pages, you have a map of Adelaide and table 1 on page 7.

The map shows the relative proportion of socioeconomic disadvantage. It is typical of Australian cities: unlike in the US where the core has the socioeconomic disadvantage, in Australian cities it is on the outer fringes. Table 1 shows different uses of transport opportunities. There is different usage and more concentrated dependence on the car as you move out from the core to the fringe, which happens to be where the low-income people are. Not only do we have a high percentage of relative income going into energy and fuel costs; you have actually got more fuel dependence; so not only a greater proportion of income but a greater absolute dependence on fuel cost.

We see this as particularly important as there is a growing recognition of joined-up policy, joined-up services to address complex needs, recognition that leaving people behind has tremendous economic costs. We are asking to recognise the broader economic efficiencies of not leaving people behind in transport poverty. In this paper I discuss a few options for prioritising transport planning and development that recognises the benefits and prioritises those providing services to people in low-income communities.

Mr Henley—To conclude these introductory comments, Mark started on policy directions: what might we do about the challenges of economic, social and environmental issues coming together in energy affordability from our perspective. Mark has talked about the importance of the public transport, and we re-emphasise, as you will note, that there is no silver bullet; there is no simple solution.

What we are saying, though, is that there is a combination of three policy sets which we regard as being likely to have at least some ameliorating impact on energy affordability. The first of those is grouped broadly under the heading of demand management. There are a range of demand management and energy efficiency options, from housing design and energy standards through to better design for electrical goods with no stand-by use—those sorts of factors. That is demand management.

Secondly, we believe there is a significant amount more work that needs to be done on tariff structures. We alluded to this in our original submission, where we raised the concept of a lifeline tariff for essential services. It is a bit like our income tax policy, where PAYE income taxpayers pay a relatively low tax on their first X thousand dollars. Similarly, we are saying that up to medium household electricity use should be charged at quite a low rate. Then as use increases we have inclining blocks, which are steep so that, as energy use increases, the margin cost increases quite dramatically. This way, the net return to the various regulated companies and the industry is still what it is now or what it needs to be, but there is a more progressive shift in how energy bills are structured. We believe that there is some significant work to be done, working with the industry, in modelling different tariff structures and different tariff design. We are also very concerned about some retailers bundling tariff structures so that the real costs of transmission and distribution do not necessarily flow through to the final retail bill.

We believe that after everything that can be done with demand management and tariffs is done then there is a role for concessions to deal with large households with low income, for example. You are simply never going to be able to have a tariff structure which makes energy affordable for them. That is where we believe better targeted concessions will need to come into play. I know that is a separate issue, but in terms of our broad rubric of policy development we are seeing demand management, tariff structures and concessions as the combination of policy measures which are best going to address issues of affordability in the medium and longer term. With those brief comments, I think we have covered a fair bit of space but we are more than happy to have a discussion with you on any issue you wish to raise with us.

CHAIR—Thank you very much for those opening remarks. I have an opening question. I am trying to follow the logic where you are understandably arguing that there are already significant affordability pressures now around energy, and that is in the absence of a price on carbon. But then you also advocate a price on carbon, which is going to make those affordability pressures even worse. How do those two statements, which I would consider contradictory, hang together?

Mr Byrne—It is a question of sustainability. A very graphic way of looking at it is this: we are flying along in a jet and we know we cannot continue to fly the way we are flying—

CHAIR—Says who?

Mr Byrne—The people who are concerned about climate change, energy and the inability to increase our oil production. There are constraints on the rate at which we can produce oil and there are consequences of our current rate of emitting carbon dioxide into the atmosphere. So there is a plane. Either we can choose to keep flying it until we run out of petrol or we can land it. It is a choice of how we approach that.

CHAIR—If you were to impose further affordability pressures, including on low-income earners, I suspect that you would want to know that what is being done in imposing a price on carbon or otherwise is actually going to make a difference to the problem you are trying to address. That would be a fair statement, wouldn't it?

Mr Byrne—Yes, we would like to know that what we are doing is supported by sound evidence.

CHAIR—So if you were to impose a price on carbon in a way that will make energy less affordable, including for those Australians that you advocate on behalf of, it would just shift the problem into another part of the world and potentially make it even worse in terms of global warming or climate change. That would not really be a path that we should go down, should it?

Mr Byrne—Not necessarily. What we are talking about here is the platform for global cooperation. We can assure you we will not have global cooperation through not cooperating ourselves. Australia, as a relatively well resourced country, with relatively high emissions per capita, has a responsibility to help enable that platform of global cooperation. So while we are concerned that the mechanisms we design do not have perverse outcomes in terms of driving energy use elsewhere without total reductions, we still call for action but by addressing those in a non-perverse way. So we are looking for mechanisms that will produce the cooperative effort

over a medium term rather than having to say, 'We won't jump until the poorest countries, the mid countries or every country jumps with us.'

CHAIR—So what you are saying is that if we make energy less affordable for people in Australia, including lower-income Australians then the United States and China will then follow suit and do something similar.

Mr Byrne—No, I believe the platform that we should play a leadership role in, should include the United States. I believe China has energy per capita consumption one-fifth of ours.

CHAIR—I am not meaning to be difficult. I have a lot of sympathy for the argument that you are presenting in terms of how we can ensure that access to energy is affordable to all Australians, with particular regard to lower-income Australians. However, obviously the whole issue around an emissions trading scheme and the like has been part of a significant debate in the Senate. Those of us who went against the government's proposal reached the conclusion that on balance the impact on the cost of living, the access to affordable energy, energy security, jobs et cetera, was quite significant without having a related environmental benefit. My colleagues on the government side would have a different view; however, that is our informed judgment. I have not found one person yet who has been able to demonstrate how what was proposed in Australia, through an emissions trading scheme or otherwise, was actually going to have a net beneficial effect in terms of reducing global greenhouse gas emissions. I am concerned that those Australians that you represent will actually be among the worst impacted if we go down an ill-considered path. I guess, given your first recommendation here, I just thought I would test that a bit. We should probably talk a bit more about—

Mr Henley—Do you mind if I just make a couple of very quick comments about this?

CHAIR—Yes, sure.

Mr Henley—This is a really important question that you have raised. Uniting Care's interest in equity says that there are a couple of reasons why we believe that focus on greenhouse gas emissions abatement is an equity issue. The first one is the observation that the people most adversely affected by climate change in the future are low income people. So if we look at ATO data on the poorest communities in Australia, by tax returns, they are in marginal farming land in Queensland, South Australia, Victoria and Western Australia—the very areas that the modelling says is going to be more marginal and worse in terms of cropping returns et cetera. So we argue that a smaller price needs to be paid up-front and sooner to mitigate longer-term adverse consequences of climate change.

The other equity issue is intergenerational equity. We believe—to put the Uniting Church hat on—that it is of crucial importance that the actions that we take now are cognisant of future impacts. Given that we accept that there is sound evidence of man-made climate change having adverse impacts on the planet, we suggest that those impacts will only be exacerbated into the future. So intergenerational equity says that we should act now, even though there is some impost, in order not to leave our children and our grandchildren with an even greater problem to try and fix up. So the issue for us is not about not acting on climate change; it is about acting on climate change and doing it in the most equitable and affordable manner.

CHAIR—When you say that we should act now I assume that the implication is that we should act now in an effective as well as the most equitable way.

Mr Henley—Absolutely. I recognise that that is a big debate.

CHAIR—In the context of, again, affordability, there is clearly a significant role for renewable energy to play, but of course increasing the percentage of renewable energy in Australia's energy mix would also lead to a significant increase in the price of electricity. Is that something that you have given any thought to, beyond the three recommendations that you made earlier?

Mr Henley—Absolutely. Again, our philosophical position is to act on climate change sooner to mitigate long-term consequences. In terms of renewables, we first of all note that the generation cost makes up a bit under one-third of the electricity bill, so even quite a large increase in generation costs would not necessarily translate into the full impact flowing through to bills. Half of the electricity bill is transmission and distribution costs, where, of course, there are other pressures, but they are not heavily dependent on the way in which the energy—electricity, in this instance—is generated. So we suggest that increasing focus on renewables has a lesser impact on the final bill.

We also accept the argument that the *Economist* magazine ran in their September 2009 edition, which was that, as renewable energy comes on stream, the efficiency and effectiveness increase, so the cost-effectiveness also increases. Thirdly, we note that the upfront costs of renewables—particularly wind but other forms of energy too—are relatively high, but the recurrent or marginal operating costs are much lower than those of traditional coal-fired energy. For those reasons, we argue that there is a sound equity reason for looking at renewables both in the medium and longer term.

CHAIR—Even though they increase the cost of electricity—

Mr Henley—In the short to medium term, yes. But the issue for us is how those costs are spread. We also note that the electricity bills will go up by 50 to 100 per cent in the next five or six years, largely because of the increase in the costs of gas-fired and coal-fired electricity. The costs, we understand, of solar and wind energy are not going up at the same rate as those of traditional baseload generation.

Senator HUTCHINS—Thank you very much, gentlemen, for coming along today and expressing your concerns on this issue of fuel and energy poverty, an issue which is starting to appear in the papers more regularly. I have not had a chance to read your recommendations or rationale but I come from Sydney so I am familiar with the differences between the US and Australia regarding the difficulty being in the outskirts in Australia. From my experience, in Sydney, the best public transport, jobs and facilities are all in the inner city, courtesy of the hangover of Labour governments controlling those areas when a significant working class lived there. Now the working people are on the fringes of the city, where there once used to be rural councils. In your paper, do you argue that inner-city users should pay more for their services—say, public transport—than people who live on the outskirts?

Mr Byrne—What I have looked at is actually the capital gains, the property value rises, associated with public transport development. Several studies put forward various percentages of the cost of a development as the rise in property value in different areas. It is actually higher for commercial properties. One study says that the property rise in association with a development is 50 per cent of the cost of the development. What we are thinking about is that, when you install public infrastructure and transport, there is a differential in winners—there are actually some losers as well in terms of noise et cetera. But there is a differential in losers. Providing transport equity, or reducing the inequity, can partially be funded by taxation—say a land tax or property tax—that captures that windfall from the public expenditure.

Senator HUTCHINS—I am sure it is also the case here in Adelaide that people on the outskirts do not have access to public transport, so they have to use cars, and they are probably older, less fuel efficient cars.

Mr Byrne—Absolutely, yes. That is a major problem.

Senator HUTCHINS—Whereas now people living in the inner city of Sydney do not even bother owning cars because there is no reason to have them.

Mr Byrne—That is the experience in Melbourne shown in this chart. It shows a threefold increase in public transport use in the core versus out on the fringe. That is an access question. We advocate prioritising the development of transport infrastructure to people on the edge, and that can be in part funded by capital gains that arise from the development.

Senator HUTCHINS—One thing that came up in the CPRS debate was the issue of trying to change people's behaviours in relation to energy use and fuel use. My colleagues may or may not wish to comment on it, but one of the issues that came up was whether the scheme proposed by the government I am a member of was the right one to change people's behaviour. We are talking about a lot of people on low incomes. Are they in the same position to be compelled to change their behaviour in fuel and energy usage as everybody else?

Mr Byrne—It is a question of hydraulics. You can squeeze people and they can respond to that pressure depending on the alternatives. We might use a blunt instrument across the board and apply it to everyone and the people on the fringe do not have as many options to respond to that change in fuel price. So they crumple. We hear concerns where people are finding it harder to look for jobs, to access services and to keep funding their commute. In 2003, transport costs were already in the top three expenditure items of the average household. If we see that scaling up it is going to have tremendous impacts and retard the economic functioning of people on the edge.

Mr Henley—To pick up the question from a slightly different perspective, we have found from energy audits, which we do with lower income households, that, when looking at the fuel or energy spend across a household, with most low-income households there is not a lot of room to move—with some there is a lot of room; with most there is not a lot of room to respond to price signals. If energy prices go up, there is just not a lot of capacity for people to use less. For low-income people demand is quite inelastic. I think that is an important principle to remember. What we have found, though, is that the intervention that works best is where people actually have a chance to spend a bit of time with an energy auditor or with peers to look at how energy

can be saved. Behaviour change occurs much more effectively from human contact them from blunt instruments like price increases.

Senator McEWEN—Can I ask a question about low-income people who have rented accommodation? What further restrictions does that place on them in terms of managing their demand for power in the house?

Mr Henley—It certainly means that in terms of energy efficiency measures, which I have put under the broad demand management category, tenants have very limited capacity to implement them. The most effective ones—things like insulation, awnings and those sorts of things—are really the responsibility of the landlord. Landlords tend not to want to put money into energy efficiency measures. Tenants, roughly the poorest 30 per cent of the population, are most disadvantaged both in responding price signals—increases in prices—and in their capacity to affect their own dwelling, because they do not own it and it is up to the landlord. Renters are a major issue. That, sadly, was one of the strengths of the insulation program that unfortunately for other reasons has gone somewhat pear shaped. In terms of the conceptualisation of that program, we were very pleased that there was room for tenants to initiate the insulation installation. That was a really important development and measure.

Senator HUTCHINS—I would like an opportunity to read your paper, and it may be that we would like to send you some questions.

Mr Henley—We would be happy to answer any.

Senator BUSHBY—We heard this morning in a different context that the best way of providing compensation for energy price increases to people who receive concessions is by subsidising the bill directly. I guess your idea about a progressive tariff would do that in a way. But then you also mentioned that there is a need for concessions for large households that have low incomes and so forth that might suffer as a result of the tariff and have no ability to do anything about it. How do you think the concession should be delivered?

Mr Henley—If I can go back, the issue with energy affordability is that different tariffs work better for different house groups. Taking two extreme examples—

Senator BUSHBY—I understand the tariff—

Mr Henley—Part of the tariff issue is the supply charge. So a pensioner couple who have very low energy use are paying a very high bill because of the fixed supply tariff.

Senator BUSHBY—If you had the lower tariff for the lower usage, they would automatically receive a concession, effectively.

Mr Henley—They would be better off.

Senator BUSHBY—But where you have a lower income household that might have a large family and cannot avoid a higher level of energy usage, the tariff would not work out well for them because they would be into the higher energy cost. So how would you deal with the

concessions for them? What would be the best way of addressing the problem that they would face under that progressive tariff system?

Mr Henley—Ideally, we would have an integrated national concessions policy. Currently, it is a very much a state and jurisdiction issue, so everyone is different. It would need to be indexed, and that is a crucial point. But your standard application process through a national standardised concessions program would be optimal, but hard to implement, I would suggest.

Senator BUSHBY—How would that work in practice without basically transferring some cash component to them to offset their costs? Would it reduce the bill?

Mr Henley—Normally, the best place for the concessionary payment, if you like, is for it to go directly to the retailer, so there is no cash going to the—

Senator BUSHBY—That is the evidence that we had this morning. That way, you are guaranteed that you are reducing the energy costs to each of those households. This will—and I did not say it, but I will quote the guy from this morning—'avoid the likelihood that they might go off and buy an energy appliance that would add to their energy usage rather than using it to reduce their energy costs.'

Mr Henley—I think that the energy retailers have really come to the party pretty well in the last four or five years around issues like energy audits, hardship programs and whitegoods replacement programs—that sort of stuff. There has been substantial progress made even in the last two or three years. The likes of AGL and TRUenergy have really lifted their game dramatically on this front and are working quite well. There have been a few glitches, but generally they are responding pretty well to their hardship customers.

Senator BUSHBY—You mentioned the idea of the capital gains from major new public transport developments. I presume that includes new roads. If you open a new highway, then that has an impact on the capital value of houses and businesses in those areas. This is obviously an idea that you are working through; it is not a proposal to do it. Any timelines yet?

Mr Byrne—I have just been looking at the different studies that have been done to work out the relative findings of distinguishable gains from windfall gains from a development and relating those to the cost of the project. It is a question that I want to put out, and it would be consistent with prioritising transport development for a low carbon future.

Senator BUSHBY—Essentially, you can see that, if they are putting a new rail link to a suburb that has developed over the last 20 or 30 years and that link is going to have an impact on the capital value of the properties in that area, there could be some scope in the future for a levy in some form to be placed on those houses to reflect that.

Mr Byrne—That is right: to share in the windfall.

Senator BUSHBY—Would you consider that it would be ongoing or that it would only be realised upon the realisation of a capital gain—or haven't you worked it through that far?

Mr Byrne—No, I have not.

Mr Henley—We think it will be an ongoing thing.

Senator BUSHBY—The concern that I would have there for the people whom you are representing is that there may well be low-income people who have houses in those areas who would then be forced to contribute to that as well. Similarly, there may well be renters who are under tenancy agreements. I think the idea has some merit, but I think you would be better off—

Mr Byrne—The higher gains tend to be closer in, so the gains are less as you move out.

Senator BUSHBY—Exactly. The challenge is in working out formulas for how you would value who should pay and how much.

Mr Henley—The Henry review will fix all that. It will fix everything else.

Senator BUSHBY—Yes, when we see it. Thank you very much.

CHAIR—Any other questions?

Senator McEWEN—Yes, I have a question about the impact on families, particularly in terms of employment, when transport costs become so great that they cannot get to where the jobs are. What impact does that have on families? A related question is: if, for example, power bills do go up to the 50 to 100 per cent that you mentioned, what household expenditure will be cut first to pay the power bills, because presumably people are not going live without power?

Mr Henley—We have not got recent evidence on that; however, four years ago UnitingCare conducted a survey of our financial counselling clients. This was just after the big 25-odd per cent hike in electricity prices that accompanied the introduction of FRC into the South Australian electricity market. We surveyed our clients soon after that and they basically told us that they were going without dental care; it was certainly not an option. No-one ever went to a dentist. They certainly went without health care. If there was a health problem, it was a case of when things got really bad you went to casualty and waited. So there was an impact on people's access to health care, and certainly their capacity to afford pharmaceuticals was out the window. Over 50 per cent reported that they went without meals from time to time and, of course, holidays and those sorts of things were certainly not an option. Kids could not participate in out-of-school activities—that sort of stuff. There were fairly substantial impacts on the health and wellbeing of families because energy became unaffordable.

We are going to conduct a similar survey over the next six months to try and get a better understanding of how families have adapted over recent years and what future energy price rises might do. You are right that our financial counsellors report that energy bills are normally the second lot of bills paid by households when they have money left after rent. Generally, low-income people are very good payers to the utilities.

Senator McEWEN—And the nexus between employment and public transport?

Mr Henley—Again, the critical thing here is that for lower income people employment tends to be in part-time and casual industries—the human services, retail and hospitality industries—where the hours are a bit random and ad hoc. Also, these industries are located outside of the

CBD. In a city like Adelaide all transport converges on the CBD. For a significant number of people who live in a middle to outer suburb in the north and who perhaps have a job in the south that is casual or part-time, their only real transport option is the car, and that eats into a substantial amount of the money being earned because their petrol costs, or their transport costs, are so high.

On the subsidies question, when we talk with our rural financial counsellors and rural clients and ask, 'What could be done to reduce your transport burden,' they sort of say, 'We'd love more public transport but we recognise that's pretty tough.' The subsidies for gas conversions to cars comes up all the time as a pretty effective measure, so we urge the committee to look at, as a short-term measure, the capacity to again ramp up subsidies for gas conversion, particularly for people in country areas. We accept that gas is a transition fuel for transport as well as for standing energy generation. In a policy sense it is not a huge item but it is something that rural communities are saying, 'That's the policy that really made a difference when it was in place.'

Senator McEWEN—Thank you very much. That is all from me, Chair.

CHAIR—Thank you very much for your contribution to the committee.

Mr Henley—Can we make one last point?

CHAIR—Of course.

Mr Henley—This has not been raised, and nobody has discussed it—it may have been raised by other groups. Globally we know there has been a bit of a push for more money to go into biofuels that are derived from grains, and this is a US policy. We are very concerned about the food security issue that goes with any subsidies, so we raise the American experience and urge the committee not to consider that as a viable option for Australia.

CHAIR—Thank you very much.

Committee adjourned at 3.16 pm