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SENATE

RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Reference: Australia's future oil supply and alternative transport fuels

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SENATE

RURAL AND REGIONAL AFFAIRS AND TRANSPORT REFERENCES COMMITTEE

Friday, 30 June 2006

Members: Senator Siewert *(Chair)*, Senator Heffernan *(Deputy Chair)*, Senators McEwen, Nash, O'Brien and Sterle

Participating members: Senators Abetz, Adams, Allison, Bartlett, Bernardi, Boswell, Brandis, Bob Brown, George Campbell, Carr, Chapman, Colbeck, Coonan, Crossin, Eggleston, Chris Evans, Faulkner, Ferguson, Ferris, Fielding, Hutchins, Joyce, Ludwig, Lightfoot, Lundy, Ian Macdonald, Sandy Macdonald, Mason, McGauran, McLucas, Milne, Murray, Nettle, Payne, Polley, Robert Ray, Santoro, Stephens, Trood, Watson and Webber

Senators in attendance: Senators Heffernan, Joyce, Milne, Nash, O'Brien, Siewert and Sterle

Terms of reference for the inquiry:

To inquire into and report on:

Australia's future oil supply and alternative transport fuels, with particular reference to:

a. projections of oil production and demand in Australia and globally and the implications for availability and pricing of transport fuels in Australia;

b. potential of new sources of oil and alternative transport fuels to meet a significant share of Australia's fuel demands, taking into account technological developments and environmental and economic costs;

c. flow-on economic and social impacts in Australia from continuing rises in the price of transport fuel and potential reductions in oil supply; and

d. options for reducing Australia's transport fuel demands.

WITNESSES

Committee met at 9.02 am

GREEN, Mr Gregory Morris, Fuel Manager, Pacific National

CHAIR (Senator Siewert)—Welcome, Mr Green, and welcome everyone to the second Sydney hearing of the Senate Rural and Regional Affairs Committee inquiry into Australia's future oil supply and alternative transport fuels. The committee is due to report on 19 October. These proceedings are public, although the committee may agree to request to have evidence heard in camera or may determine that certain evidence should be heard in camera. I remind all witnesses giving evidence to the committee that they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee. Such action may be treated as contempt by the Senate. It is also a contempt of the Senate to give false or misleading evidence to a committee. If a witness objects to answering a question, that witness should state the reason for the objection. The committee will determine whether it will insist on an answer, having regard to the grounds claimed. If the committee decides it wants to insist on an answer, a witness may request that that be given in camera. Mr Green. Do you wish to make an opening statement before we proceed to questions?

Mr Green—I do have an opening statement. As the Fuel Manager at Pacific National my role is the management of procurement and distribution of our fuel on a national basis. Pacific National appreciates the opportunity to provide further detail on our submission. The original author of our submission is not available, as he is no longer with the company. My role was to provide a good deal of the technical detail which underpinned the submission. I am here in that capacity and I will do the very best I can to answer all your questions.

In our submission we have highlighted the current fuel efficiency of rail and have explored a number of options for reducing Australia's transport fuel demands. We have also included a short discussion on alternative transport fuels. To put our fuel demand in perspective, we purchase one million litres of diesel fuel per day, accounting for some 15 per cent of our operating costs. Our highest operating cost item is track access fees, which account for 25-odd per cent of our operating costs. The condition of the interstate track is one of our concerns that does provide an inhibiting factor for us to forcibly reduce our reliance on diesel fuel. That said, Pacific National does have several initiatives in place and planned for the future to successfully manage our fuel, and they are alluded to in our submission. I look forward to your questions.

Senator NASH—We have been looking at the efficiency of rail as an alternative to the trucking industry. One of the questions that has been raised about rail is obviously the difficulty of point-to-point transport. If we are going to increase our rail usage, obviously long haul is really the place we need to head. In terms of efficiency, how do we go about that end to end where we still need that capacity for the trucking industry to deliver goods?

Mr Green—By 'end to end' do you mean the initiating and terminating of the train?

Senator NASH—Yes.

Mr Green—That would still have to be seen as road haul. Smaller trucks are going to deliver goods from the railhead to and from local businesses.

Senator NASH—What do you see as the factors inhibiting the greater use and greater development of rail?

Mr Green—In the development of long-haul rail?

Senator NASH—Yes, particularly in long-haul rail. There are obviously great benefits in the rail network. What are the things inhibiting the development of the greater use of rail?

Mr Green—One of the prime items, as I have mentioned, is the condition of the track. There are 80- to 90-odd speed restrictions in place on the major corridors—the north-south and the east-west corridors—as I have alluded to in our submission. The cost in fuel alone of actually slowing a train down that is 4,000 tonnes with 8,000 to 12,000 horsepower at the front is of the order of several hundred litres each time. Across the total journey, it can be 1,000 to 1,500 litres per locomotive and those trains would typically have two or three locos onboard. So, if there was a good quality track north-south and east-west—I am talking Melbourne-Brisbane and Sydney-Perth—the savings nominated in various reports by independent bodies is 1,000 to 1,500 litres per loco on those journeys. For us that would equate to a one per cent saving on our total fuel burn for each of those corridors if they could be rectified. That is a multibillion dollar task that we see as not having had the attention it deserves over the years.

Senator NASH—Attention from where? Whose responsibility is it in your view to have that track at the level you would like to see it?

Mr Green—It would be a personal view.

Senator NASH—That is all right.

Mr Green—We do not own the track. It comes back to the track owners and how they see themselves performing that task.

Senator NASH—Thank you.

Senator O'BRIEN—I see in your submission you talk about the need for some research on the use of biodiesel in the locomotives that your organisation uses. Given that biodiesel is used extensively in other engines, what is the difference? Why is there a need for research here for the engines that are being used in the locomotives in your business?

Mr Green—I do not see, for instance, that the biodiesel is used extensively in any other engines. It is being used in niche areas. There are some issues still to be resolved, including the availability on national basis. There is some concern and further research needs to be done on each engine type as to potential marginal power losses, which would inhibit us on the track in that we are required to have a particular power to weight ratio when we go on certain sections of track to cover the ruling grades. From that point of view, if we were to reduce power, we would either have to put an extra loco on the front—and that would be a $4 million to $5 million investment—or we would have to reduce other revenue and the carrying capacity, hence lowering efficiency. Additionally, there are issues of inconsistent quality from the various sources of biodiesel around at the moment available on a national basis. We are a national

carrier. We are operating from Townsville through to Perth. So we need to be consistent with the fuel being supplied to our machinery.

Senator O'BRIEN—One of the big issues with rail is the disadvantage that the intermodal connection has against the trucking industry's ability to pick up a load at point A, take it on the same vehicle to point B and unload without any handling in between. What work is Pacific National doing to improve efficiencies to be more competitive with the trucking industry in that regard, or is that just a bridge too far?

Mr Green—I do not have a lot of information on that area other than that at our major terminals for long-haul work, the possible small disadvantage at the originating port and the destination would certainly be overcome by the long-haul efficiencies. Certainly for short-haul work, that particular movement would become a larger component of the total work. We certainly do have links now through to ports. We do take a lot of our container load directly to the port, unload there and pick up the same way, and that is in virtually all states.

Senator O'BRIEN—Where it is going to a port, clearly everyone has to connect with a new mode. The example I was looking at to see what had been done was where it was going from Australian premises to Australian premises. I was talking to some trucking insurance people recently. I was wondering, apart from those speed and safety restriction factors on the north-south track, why a roll-on, roll-off type rail service from Melbourne to Brisbane would not work more effectively—you could load a truck on at one end and drive it off at the other to avoid the problems of double-handling. It was suggested to me that it would be a safer and cheaper option. Would that be right?

Mr Green—We do have some of that happening at the moment with our trailer rail operation, where a specifically designed semitrailer becomes part of our train consists, and that is picked up at the other end. We do have an element of that within our business—a specific division which deals with trailer rail. I think that at this stage that is predominantly on the east-west corridor and less so on the north-south corridor.

Senator O'BRIEN—So there is potential for it to improve on the north-south corridor when the rail is improved?

Mr Green—Yes, that would have to be a consideration. The percentage of business on the north-south corridor on interstate rail is much lower than it is on the east-west corridor. I am not familiar at the moment, without referring to notes—

Senator HEFFERNAN—Are the bridges high enough for that?

Senator O'BRIEN—I am not talking about in Sydney; Sydney is a problem.

Senator HEFFERNAN—I am not talking about Sydney either; I am talking about Junee.

Senator O'BRIEN—You are talking about double stacking.

Mr Green—For double stacking, if we are looking at the trailer rail option—

Senator HEFFERNAN—Not double stacking, just sitting the trailer on the—

Mr Green—What I am talking about is the actual trailer becoming the wagon itself. The truck's trailer does not go up on top of the wagon; it is the wagon. It is delivered locally. It is effectively a rail wagon with road wheels. That is the simplest way to look at it. There are elements to that already in place, as I say, with our trailer rail operation, where the actual wheel set of the truck trailer is cranked up, lifted above the track and then hooked into the consist. That element has already been operating for some 10 or 15 years, I would think. The concept was first trialled 15 years ago.

Senator O'BRIEN—That does not have a huge penetration in the market, does it?

Mr Green—No, there is not a huge penetration because they are specific trailers for that operation. They are not economic for general freight work. They are specific for the rail operation. It suits a customer base where they have sufficient business with the rail and it has constant use back and forth. So that could be further developed, yes.

Senator O'BRIEN—What is the state of play with the federal government and the Tasmanian government Pacific National negotiation about the Tasmanian track?

Mr Green—I am not up to speed with that. My portfolio is primarily fuel. If you wish, I could come back with a written response to that. We are actually working with them at the moment, so that has kicked off, but I am not aware of the specific details.

Senator O'BRIEN—It has not been finalised, obviously.

Mr Green—Of that I am uncertain. Again, my role is specifically on the fuel side. I can say that there is additional confidence with our Tasmanian operation, and that is already showing in increasing business and activity down there. I see that with our fuel buying.

Senator O'BRIEN—In regard to your submission on competitive neutral pricing between road and rail, does that put Pacific National at loggerheads with the rest of the transport business in Toll?

Mr Green—Not to my knowledge.

Senator O'BRIEN—The road freight section of the Toll company has no problem with the submission?

Mr Green—None that I am aware of.

Senator O'BRIEN—Could you check that and advise us whether the other part of the Toll transport business questions this submission, because it is in conflict with the trucking association's view of the outcome of the rejection of the third charges determination.

Mr Green—Could you repeat that.

Senator O'BRIEN—We will send you the *Hansard*, which will contain the details of the question. If this part of the Toll business is saying that, effectively, it is a $100 million subsidy, I want to be sure that the road freight part of your business agrees with that.

Mr Green—Right.

Senator HEFFERNAN—In terms of competitive neutrality—and you say that you are the fuel man—what percentage of your outgoings is for fuel? Did you say it was 10 per cent?

Mr Green—Something like 15 per cent. It varies with the mode of business.

Senator HEFFERNAN—Is that percentage moveable, other than by efficiencies in the rail line? How much of your outgoings is what you pay for the use of the track?

Mr Green—Something like 25 per cent and maybe slightly higher.

Senator HEFFERNAN—If there is an improvement to the track, who determines that there should be a cost recovery for the use of the track?

Mr Green—That would be a discussion between the track owners and our corporate people.

Senator HEFFERNAN—The other side of your argument could be, 'If these blokes want the track improved, we will do it but we will charge more,' and that may destroy your argument.

Mr Green—Destroy would be unfortunate; complement would be better.

Senator HEFFERNAN—But it could offset any other improvements you get with speed et cetera. This is a nasty business obviously and everyone wants to get a quid. As Senator O'Brien has said, they are not going to give ground to the trucking industry. You would wonder how commercial the rent is that you pay for the use of the track compared to what ought to be spent on the track in respect of its capital value. It could well be that if you put all that into it, you might have to have a massive subsidy to make it a proposition. Are there tracks in Australia that are satisfactory, in your view?

Mr Green—There are sections of track that are satisfactory.

Senator HEFFERNAN—Where are they, generally?

Mr Green—I am not aware of the specifics.

Senator O'BRIEN—The east-west track is a whole lot better than the north-south track. 'Nothing is perfect' is probably a fair response to that sort of question. I understand that the volume of land based freight that travels east-west is approaching 80 per cent, whereas, north-south, it is below 20 per cent.

Mr Green—It is somewhat like 20 plus or minus a small amount. On one of your other points on commercial viability, we have to look at the total commercial viability of improvements to

the track. Another factor for all interstate carriers is the time factor and being able to get goods to the market on time. That is also a huge benefit.

Senator HEFFERNAN—I understand all those arguments, but the argument that Senator O'Brien was putting is that once upon a time all the wool used to go on rail but it was not worth mucking around with—by the time you got the truck to the Junee rail siding, unloaded it, eventually got it down and had the same thing happening at the other end, you might as well have just trucked it. Would the east-west line have been a federal line?

Mr Green—To my knowledge, that goes back before my time.

Senator HEFFERNAN—The difficulty with the north-south line is that the state governments have managed to flick the real cost, because they handed the lines over in pretty poor nick and they were never, ever going to be fixed. The whole thing was a con job in the early days. The state of the main southern track got to the point in Junee, where there used to be a couple of hundred drivers, at which the local drivers would not let their families travel on the trains because the track was so crummy.

Mr Green—I am familiar with some of the Junee drivers.

Senator HEFFERNAN—This might not be as simple as it is made out to be, and the committee needs to be aware of the fact that if the real cost of sorting all this out is put into the equation it might be a completely different sum.

Senator MILNE—I would like to follow up on the discussion in relation to the $100 million a year subsidy to B-double operators, which you contend has occurred with the failure to increase the truck prices. You go on to say:

... there is ... no compelling commercial justification to upgrade PN's fleet of older grain haulage locomotives, despite the obvious fuel efficiency benefits of such a move.

If there were really obvious fuel efficiency benefits and the cost of fuel is 15 per cent of your operating costs, why is there no compelling argument to upgrade?

Mr Green—That particular grain section of our locomotive fleet is an isolated area. It is a very seasonal operation. The style of locos there tend to be smaller and older, and for a combination of reasons—a return on investment, the state of the track in the areas the locos are running in; the track may be a lighter weight and unable to take the heavier load—it is primarily a seasonal operation. Those locos are not in full-time service, so the return on investment is much lower. The total litres through those small locos, which is of the order of 900 horsepower compared with our main line locos of some 4,000 horsepower, is not justified based on the smaller fuel throughput through that equipment.

Senator HEFFERNAN—Surely the below line management of the branch lines is a con job? Allegedly, they are going to be upgraded before they are handed over. But they are not going to be upgraded; they are falling apart. That is the reason it does not work. You cannot run a decent train down one of those lines, because the line will fall apart. To fix all this, in capital terms, is what I am trying to get at; it is a massive task.

Mr Green—There are many elements of that grain operation where the larger locos just cannot access the track and the smaller locos—again, used on a seasonal basis—are used to haul the grain task, if you like, to the larger centres. They are then consolidated into a larger train which goes to the ports at Melbourne and Port Kembla.

Senator MILNE—You talk about the significant savings that could be achieved by expanding the use of hybrid technologies. We had quite a lot of evidence about natural gas as a heavy transport fuel. Is natural gas suitable for locomotives? If so, have you looked into that?

Mr Green—We have not fully assessed that operation at the moment. There would be some issues to overcome with natural gas—the pure weight, the size, the configuration of the storage vessel would have to be assessed. We are yet to see significant savings. I do not believe we have mentioned significant savings in our submission but we are certainly assessing all options available for the future.

Senator MILNE—So you are looking at compressed natural gas, liquid natural gas?

Mr Green—I do not think we have officially addressed that issue, but that is a part of our internal discussions, yes.

Senator MILNE—What do you need to roll out the hybrid technology more extensively than you currently are doing?

Mr Green—We have no hybrid technology currently in place. Again, that is a matter for review by our company. We recognise that those items do exist. Typically they are suitable for the lighter type of work, which would be more a shunt engine type arrangement whereas on the main line track we require 4,000 horsepower. We do not see in the conceivable future that a hybrid unit would be able to manage consistently 4,000 horsepower outputs. Certainly, for our shunting operations, we currently use small logos. The speed and the magnitude of the task are much smaller within our shunting yards.

Senator MILNE—So, from what you have said so far, the biggest impediment to greater fuel efficiency for your operations is the state of the track?

Mr Green—That would be the single largest, yes.

Senator JOYCE—I noticed in your submission at point 4.0 you say:

There are a number of bio-diesel plants planned for development in Australia over the next three years.

In light of the passage of the legislation last week, which basically took away the advantage of biodiesel, is that still the case? Have you done any research on that? Can you advise where these biodiesel plants are going to go?

Mr Green—We would not be in the business of putting the biodiesel plants in position. I am not familiar with something that has happened as recently as last week on those issues. So far as locations of biodiesel plants, logically, they would be in higher volume usage locations. But that is for someone else to determine for their business case.

Senator JOYCE—It is in your business case here; that is why I asked the question. Pacific National is proposing a research project to determine the suitability of using biodiesel. What is the time frame and how do you envisage doing that?

Mr Green—We envisage utilising a 3,000 horsepower test engine which is in Melbourne at one of the cooperative centres. We have put a business case for that to determine the cost structure and the actual parameters for that testing. That is for within the next 12 to 18 months.

Senator JOYCE—So you have the cash flow already and the costing for it is already in your budgets. It is a definite for the next 12 to 18 months.

Mr Green—I am not privy to whether it is definite. I would have to come back to you on that.

Senator JOYCE—Obviously you have a major cost advantage, as you say, over road transport. That is something I want to follow up on. You must have done a sensitivity analysis of basically where the price of oil has to go before road transport is unviable. You have such an immense cost advantage over road transport. At what price will a barrel of oil be whereby road transport basically becomes unviable?

Mr Green—I do not have information on that. I guess it would depend on the various pricing regimes of the day, excise et cetera, so it would be a very difficult one to predict.

Senator JOYCE—Do you do a sensitivity matrix or anything like that to make a comparison between the price of a barrel of oil and your advantage in structure, your advantage in cost? I want rail to work more. The way the market is going at the moment will make you become more viable, won't it? The higher the price of oil, the more viable you should become every day.

Mr Green—The logic would hold, yes.

Senator JOYCE—What is inhibiting that? I still see 1,600 trucks a day going up and down the Newell Highway and tearing through Moree right next to a railway line. What is going on there?

Mr Green—I cannot say what is in the heads of our customer base, but discussion points within our company certainly are around the degree of confidence that customers have about moving their freight on road and their confidence about on-time delivery.

Senator JOYCE—Can you explain on-time delivery?

Mr Green—It is mentioned in our submission. Over the last several years, 1½ to three hours have been added to our transit times on north-south and east-west due to track conditions. That affects our crewing operation and the maximum number of hours that our drivers are allowed to be in the cab. All of those factors come into it and increase our costs and delay our arrival times. One of the key elements of on-time arrival is arriving on the correct day, at the correct time, so that the freight can be distributed immediately from the train to the customer.

Senator JOYCE—It is not an issue with Pacific National, but certainly with Queensland Rail the correct time and, at times, the correct place become big issues. Do you have any problems

doing short hauls? Everyone is talking about long hauls. I have just returned from Windorah, where $50 million worth of cattle a year head off towards Dinmore, but they want to get most of them to the Roma saleyards. People have no problems taking them from Quilpie. But, to keep the railway line viable, we have to get the trucks off the road and use the railway line; otherwise, the railway line will be closed down. The issue is that they have no problems taking them to Dinmore, but they have a big problem getting to Roma, which is halfway along the track. Do you have any such problems in your organisation, or can you throw some light on issues with short haul, that on-time arrival and actually getting things off the train to where they are supposed to be? Is that a logistical nightmare for rail? Is there any reason why it is more complicated with rail than with anything else?

Mr Green—You would have to talk with Queensland Rail. Our business is primarily interstate type work; we go across state borders.

Senator JOYCE—I will turn the question around.

Senator HEFFERNAN—I will answer it for you. The difficulty before the saleyards is the curfew. If you muck around yarding cattle and trucking them to a train, your cattle are too light by the time you get them to the saleyards, you have lost more than 10 per cent of your weight in curfew. It is all right after you have sold them, because you are being paid on the weight at the weighbridge, they go off to the abattoirs and it is the dead weight. The problem is the live weight at the saleyards, old mate.

Senator JOYCE—Thank you for that, Senator Heffernan. Mr Green, you said you do primarily interstate work, but would an intrastate haul under a certain distance make your work unviable? Do you say in your analysis, 'We're only interested in hauls that go so many kilometres or longer?'

Mr Green—I am not privy to that information; I do not work within that part of our company. If you wish to put that as a question, I can put it to the appropriate people and have a response prepared.

Senator JOYCE—You buy a million litres of diesel a day.

Mr Green—Yes.

Senator JOYCE—Do you buy it at the terminal gate price?

Mr Green—We have a commercial contract in place with our major supplier which is not reflective of terminal gate price.

Senator JOYCE—I imagine it would not be. No doubt you would secure your position on that with Singapore based swaps and options? I would, if I were dealing with a million litres a day.

Mr Green—We certainly have an escalation process which is based on a Singapore marker.

Senator JOYCE—You might not want to answer this question, and I can understand completely if you do not. What sort of discount on the terminal gate price do you generally get? Do you ever look at the terminal gate price and find that you have a 10 or 15 per cent advantage?

Mr Green—I do not track the terminal gate price. I have no need to track it.

Senator JOYCE—There have been some statements that the terminal gate price is the be-all and end-all. But is not even that; it is a line in the sand, and if you buy it at that price you will go broke.

Mr Green—It is a good reference point.

Senator JOYCE—To do this more efficiently, we obviously want to encourage freight to move off the road and onto rail. The biggest petrol stations in Australia are at Goondiwindi, because of the huge transport of heavy goods going backwards and forwards through that area. In Pacific National's business plan, can you envisage any reason why we cannot get a proper linkage between New South Wales and Queensland in that corridor, which goes through all the inland coal and wheat towns? We have a mystery tour around Moree. It stops there and then starts again around Goondiwindi. What is going on there?

Mr Green—I am not familiar with that part of the track. Queensland operates on narrow gauge and New South Wales operates on standard gauge. That would have to be a factor. I am not familiar with the fuel depot at Goondiwindi that you mentioned. I have not been to that fuel depot.

Senator JOYCE—It is the BP at Goondiwindi.

Mr Green—What do you mean by 'large'?

Senator JOYCE—I obviously know there are different gauges, because I live there. But there is differentiation in gauges and differentiation in coordination between the states, and a line on a map means that your business basically becomes unviable. If it was viable in that area, we would be able to move a tremendous amount of this haulage off the roads—there are 1,600 trucks a day going through there—and onto rail. That would make you money and save the states—for whatever purpose they are still around for—some money on roads. It would save the federal government some money on roads, too.

Mr Green—There may well be some justification to your argument. It is a commercial difficulty for us to set up and compete in the Queensland market. We have an operation that runs from Brisbane to Townsville and on to Cairns. That operation was put together upon securing a large section of business that justified the setting up of a new operation that involved 13 locos and associated wagons. It is difficult to compete with incremental volumes in other sections of the Queensland network because we would have to gear up with additional loco sets and wagon sets. We would need a significant amount of business to justify the initial set-up costs for that equipment. To be cost-competitive in this area we would have to pick up incremental business, and we do not have the equipment for that.

Senator HEFFERNAN—Who owns the line you run on?

Mr Green—Queensland Rail—the Queensland government.

Senator JOYCE—The research we have seen says there is no technical differentiation between biodiesel and mineral diesel—that one is indiscernible from the other. So, since your major routes could be inland, if you were buying biodiesel would it be feasible to have major biodiesel purchasing facilities in regional Australia?

Mr Green—That would be a necessity.

Senator JOYCE—A necessity?

Mr Green—There would have to be a distribution arrangement whereby the biodiesel could be moved out to the various locations where we run. I would dispute the comment that is put forward by others in the industry that biodiesel is not discernibly different from the current diesel. To my knowledge, there is no Australian standard for that.

Senator JOYCE—This is a very important thing to put on the record. There is no standard, but let us say there was; let us say that we developed one and concentrated on that. There is potential in regional Australia to pick up—using B49—490,000 litres of biodiesel a day. I imagine it would be a major boon to regional areas if we could deliver that to them.

Mr Green—I have no comment on that. We would have to look at the commercial viability and how it was set up.

Senator HEFFERNAN—Of course it would depend on farmers being able to produce the goods, with fertiliser going up 10 or 15 per cent a year because of the world chemical cartel and everything else. It is all based on farmers being able to produce it at a cost. Getting back to your viability—and obviously long-haul heavy haulage makes a lot of sense for Australia for transport, and for bulk goods especially—how much of your viability depends on what you pay for the rent of the line?

Mr Green—As I say, it is 25 per cent of our costs.

Senator HEFFERNAN—But how much has it gone up in the last five years?

Mr Green—That I am not familiar with.

Senator HEFFERNAN—Could you get for the committee the pattern of cost increase for the line, because it may well not reflect the real costs of maintaining the line. Could you also compare for us the rental of the various state government-owned lines versus the national Australian road track charges, or whatever they are called, so that we can get some comparison on who is doing who in the zoo in terms of charges.

Mr Green—Okay.

Senator STERLE—In your submission you say that operators of B-doubles get government assistance. Before we go any further, I want to be on the record as saying that I believe there is plenty of room in Australia for both modes of heavy haulage and freight removal—

Senator HEFFERNAN—Hear, hear!

Senator STERLE—Senator Heffernan knows where I am going here. Clearly I am pro road transport but I also believe that there is a place for rail. Rail is very good at what it does, in terms of bulk commodities and minerals and that sort of stuff. But you will never be competitive with road transport in service—and I know that will get a few of our rail people offside—because people want their freight, door-to-door, yesterday. We cannot escape that. Could you tell me about your statement about the incentives provided by government to B-double operators: what incentives?

Mr Green—That relates, as I understand it, to an assessment that suggested that road carriers should bear a higher rate than they do currently of the cost of maintaining the roads and there was a particular item that was not adopted which equated to $100 million. On the other side of that argument we see that $100 million cost recovery has been forgone on the road transport side, whereas there has not been a similar benefit put to rail. Every time we go on the track we pay for every tonne, for every kilometre that we are on that track.

Senator STERLE—I would dispute those figures—and I have argued against those figures for years and years. I have not seen the latest set of figures, I must admit—

Senator JOYCE—You've only been here for a year.

Senator STERLE—Just for the record, Senator Joyce, I have been arguing for road transport and taxation for many, many years, going back to the late seventies when I first started truck driving.

Senator JOYCE—I will take your word for that.

Senator STERLE—But the last figures I argued against were that the Australian transport industry was taxed at 37c a litre, through GST and the road taxes at the time and all sorts of stuff, but that only about 11c was going back into the roads. So I refute the claim—one that I hear all the time—that the trucking industry does not pay its way. I believe the trucking industry damn well does pay its way.

Mr Green—To bring you up to date on that latest item, the excise on diesel is now 38.143c per litre. The trucking industry gets a rebate of some 18-odd cents a litre on that.

Senator STERLE—Which is being phased out.

Mr Green—That I have not seen as yet.

Senator STERLE—What I mean is that that is the bill in front of us in Canberra.

Mr Green—Okay. As for the 38.143c a litre, the rail industry's commentary on that is that, where we use one litre of diesel to move a particular amount of goods, road uses three litres, therefore road is receiving three times 18c per litre for the movement of those goods and rail is receiving one times 18c per litre.

Senator STERLE—They would argue that they are paying three times as much at the bowser too. But I just wanted to clarify that, because I am not convinced that the trucking industry does not pay its way. I am not convinced that the government is handing out, hand over fist, assistance to the road industry. Bear in mind that there is a place for both modes of transport—make no mistake about that.

Mr Green—Agreed.

Senator STERLE—And your company is a major employer within the road transport industry in Australia too.

Mr Green—Agreed.

CHAIR—In your submission, you refer to the AusLink delivery of the $1.8 billion and you make a comment about the slowness of its delivery. Would you elaborate a little bit on that? What are your concerns about that?

Mr Green—That was not part of my submission or the supporting information in this document here. As I understand it, it is to do with the upgrade of the tracks. That has been deferred quite a few times. There is some action being taken in the Casino area at the moment which is due for completion later this year. That will certainly be a boon to all operators on that track. But to answer your question concisely, the deferral of various projects has included bridge works. There are bridges in northern New South Wales for which we have to slow down to 25 kilometres an hour because of the state of those bridges: they just cannot take the forces involved with a higher speed train. As I said earlier, that is a significant cost in fuel, time and maintenance of the equipment for braking. We have 50 to 80 wagons which all have to have their brakes applied—and there is a quite severe cost. I am sure that some of the speakers later in the day will be able to comment on that. They have been involved in studies of that over many years.

CHAIR—Have you been in negotiations with various authorities—and I appreciate that you probably have to deal with a number of them, interstate ones et cetera—as to where you consider the real black spots are?

Mr Green—That is a continuing—ongoing—negotiation.

CHAIR—Thank you very much, Mr Green, for your evidence. If you would forward the various bits of information that you said during your evidence you would forward to us, that would be much appreciated.

Mr Green—Okay. Thank you, Chair.

[9.50 am]

HONAN, Mr Andrew Thomas, Chair, Government Relations Subcommittee, Rail Technical Society of Australasia

MICHELL, Mr Maxwell John Rodon, Member, Government Relations Subcommittee, Rail Technical Society of Australasia

CHAIR—Welcome. I remind you that these are public proceedings, although the committee may agree to a request to have evidence heard in camera and/or determine that certain evidence should be heard in camera. All witnesses giving evidence to the committee are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee. Such action may be treated as contempt by the Senate. It is also a contempt of the Senate to give false or misleading evidence to a committee. If you object to answering a particular question, you should state why and the committee will consider whether we want to insist on an answer. If we do insist, you may request that we hear that in camera. I invite you to make an opening statement before we ply you with questions.

Mr Honan—The RTSA wishes to highlight and elaborate on some of the aspects of its submission, and we welcome this opportunity to do so. In its 2005 report, the Productivity Commission highlighted the linkage between energy usage and the transport task. Some 43 per cent of Australia's energy was consumed in transport. Considering that transport is a derived demand, this has some very significant implications for Australia's economy. Forty-three per cent of Australia's energy was consumed in moving products to market, inputs to production lines or providing mobility to people.

Of concern was that, in the period 1973-74 to 2001-02, energy increases in transport were outstripping all other sectors. Thirty-nine per cent of the energy increase in this period was attributable to transport. It is not surprising to find the complete dominance of oil in this energy usage—97 per cent of the energy in transport came from oil. When we look at the factors for this high consumption, we see that some are undoubtedly due to Australia's geography, its large landmass, the capital cities in each state and the large distances to overseas markets. However, the RTSA believes that there are more significant factors due to the inefficiencies within our transport systems and the structure of our cities.

I would like to turn particularly to the non-bulk freight along the eastern seaboard capital cities. Currently, the market share of rail on the eastern seaboard capitals is somewhere between 10 to 20 per cent of the total contestable market. Given that rail uses one quarter of the litres per net tonne kilometre of road, on an oil usage basis there can be considerable savings of oil if modal shift were to occur to rail.

One of the dilemmas with land transport is the low modal share of rail, given the significance of fuel pricing and the cost structure of land transport. This low modal share is explained in part by the various cost and pricing structures that operate differently across road and rail, particularly for infrastructure access pricing. These pricing frameworks are currently being reviewed by a Productivity Commission inquiry; however, this pricing framework has some

relevance to your inquiry. Diesel price includes an excise which has been used in large part to justify road expenditure, leaving aside the contributions each vehicle class makes to the excise pool; therefore, modes which have a high fuel use invariably attract high infrastructure provision. Modes that have a low fuel use do not attract the same infrastructure provision using the excise argument. The effect is that the overall pricing is not sending the signals to the transport markets that promote conservation of oil.

The RTSA has long campaigned for competitive neutrality between modes which will ensure rail and road operate in a transparent and consistent manner. Although fuel pricing plays an important role in pursuing road engine efficiency, the increasing overall transport task far outstrips any fuel efficiency gains. The net effect is an ever-increasing use of fuel.

An interesting outcome of the road sector is a drive to improve efficiency by increasing unit size with the introduction of B-doubles and B-triples. The irony is that the ultimate unit size can be delivered by intermodal or short line rail. Not only can unit size be delivered by rail but also the rolling resistance of a steel wheel on a steel rail is much lower than that of a rubber tyre on bitumen. The RTSA believes that this will deliver a virtuous circle, with significant economic benefits along with a real shift in oil usage if modal shift were to occur.

Of particular concern to the RTSA is the rate of fuel price increases compared with the rate of rail infrastructure and capability development to effect any modal shift to rail. Although there is current activity in rebuilding rail capability, the fear is that this rail capability would not respond quickly enough to market price rises in oil and the increasing demand in the transport task. This lag in response may have an impact on Australian economic growth. The RTSA commends the inquiry to take a strategic rather than a market view to oil usage.

Turning briefly to passenger transport, our submission highlights the complex nature of urban transport. In terms of oil usage, there are a number of market responses and market failures at work. Firstly, passenger vehicle fuel efficiency is showing very strong gains. This market response to fuel price will maintain the high levels of individual mobility. Other issues, however, such as congestion, liveability and access to transport will be key issues for cities and will present new challenges for transport.

The RTSA sees both heavy and light rail as playing a significant role within an integrated public transport system—one that also supports oil conservation. At the same time, the RTSA also believes that any strategic assessment of long distance passenger transport should include a review of high-speed rail. Thank you.

Senator O'BRIEN—There are plenty of high-speed rail options around the world. What are you really talking about?

Mr Honan—It is just basically a strategic review. If, for example, you were talking about the price of fuel and looking at fuel conservation in the airline industry and you are looking for long-term strategic solutions, we would just take the opportunity to say, 'Let's have a review of high-speed rail.'

Senator O'BRIEN—Stick in a Sydney to Melbourne MagLev or something.

Mr Honan—No, it is just a general comment. If you are looking at airfares or fuel for airlines, it is just an open statement: do not discount high-speed rail.

Mr Michell—The general thing about high-speed rail is exemplified by the Japanese Shinkansens and the French TGVs, although there are other things around. For instance, cities like Tokyo and Osaka—admittedly, with a fair bit of population between them—have 130 million passengers a year travel between them on train services that are of half an hour or quarter of an hour frequency over a 300-kilometre journey. It is roughly saying that there will be a suburban service to Canberra and that it will take less time than it does to get to Campbelltown. It derives a lot of demand but you have to pay a lot of money to build it, of course. Because it is electrically operated, it does not get into the oil energy business; it gets into coal energy or whatever else.

The key is that, without a quantum leap of some sort—it does not have to be quite that quantum—the rail passenger business, I think, does not have much future, except in urban and high-congestion areas. If the density of population is not adequate to fill a train regularly, you cannot run it frequently. And if you cannot run it frequently, people will not use it. It is a circular argument.

Senator O'BRIEN—It is a massive infrastructure investment. Who would make it?

Mr Michell—The evidence from overseas is that there is a very high seed cost in creating high-speed rail but the long-term benefit from it has been very substantial. The French TGV return on investment that they aim for and get is 10 per cent. Any investment company that could get 10 per cent would be in there straightaway, and probably will when they get around to privatising in Europe.

Senator O'BRIEN—The problem with rail that you point out is the intermodal connections. What are the solutions?

Mr Honan—I think it is a number of things. Certainly, from our point of view, competitive neutrality and access pricing is a key one. There are a lot of institutional barriers as well—for example, the different way the operating systems operate between jurisdictions. We would like to see—

Senator O'BRIEN—You mean the Queensland- New South Wales interface, for example?

Mr Honan—It is not just the gauges. We have a national accreditation package which is being approved by the National Transport Council. We would like to see reform in harmonisation of safety arrangements and operating systems across the states. They would all be very positive. But if you are focusing on the intermodal connections, they certainly are a problem. The connections through cities and into cities are a problem. Equally, there is a wide front that needs to be attacked to get efficiencies back into rail.

Mr Michell—One of the issues is that intermodal requires two different modes—obviously, otherwise it would not be intermodal—so what you are getting is rail with road end-on delivery, and the end-on deliveries in some cases, such as the Sydney to Melbourne haul, can actually be more expensive than the line haul between the two capitals. That is partly because of congestion

and all sorts of other things that go on both in terminals and on the local roads, but it is also because rail does not really go to the heart of where industry is now located. In Melbourne there is a section of railway between Newport and Sunshine which at one stage was wall-to-wall industry—most of which, I might add, was pretty noxious. It was abattoirs and things like that. But they all had rail sidings and rail activity going on in them. Bit by bit, they dropped off, and I think none is active in that area now. Industries wandered off into areas where there was no industry within a bull's roar. Consequently, if you are going to have any type of intermodal activity it has to be a lot of road on what are often expensive or long-haul moves to get in. It is very much as Bill Heffernan said: once you put it on a truck to go half the way, you might as well go the rest of the way.

I think there is an issue there for rail. Rail has had a tendency in the past—and I think it still lives in this culture—to think that line haul is good, long haul is good and sidings are not good, without even thinking about what 'sidings are not good' means. The Darwin railway, for instance, unlike all the other major line haul intercapital activity, stops and shunts at Alice Springs with quite a large amount of traffic and at Tennant Creek and Katherine with smaller amounts of traffic. The end-on road haul from Katherine is actually coming out of the Ord River—some of it, not all of it. Katherine itself is becoming quite productive. The fact is that rail there has found that it can deal with small sidings and intermediate stops. It has a different attitude, which is driven very much by the fact that it has to make a quid out of it. It is quite different from the attitude here, which says: 'Forget your siding! We are not going to muck around and put a few wagons into your siding; it is going to cost too much,' without thinking what the alternative is. The alternative is that you do not have the traffic. I think there is a real issue there with intermodal freight. It is not a solution; it is simply a way of dealing with some things.

Another issue, which is much longer term, is town planning and city planning. Planners do not plan cities. Someone plans the subdivisions—usually the developers—somebody else plans the water supply, somebody else plans the electricity and, if you are lucky, somebody plans the transport. But they do not do it in concert; they do it independently. So industry develops where the land is cheap and where the services can be provided by somebody with very little cost to the developer—because they do not want to pay for this stuff. It goes in a circle and creates dysfunctional cities in the passenger transport area, which is also part of the planning problem.

There is an old saying—and I think it has a lot of truth—that people will travel for somewhere between half an hour and hour to get to work and the same to get back home again at night. Back in the days when you either had a horse or you walked, the cities grew to four or five kilometres out. Trams started to develop and then suburban trains, and cities grew to 10 to 15 kilometres out. After World War II, cars came on the scene and cities grew to 40 or 50 kilometres out. The trouble now is that it is taking a lot more than an hour to do those 50 kilometres, so we are starting to get dispersal of centres. But they are unplanned centres. Parramatta has accidentally turned out to be a centre, but it will not be the only one. There will be other centres out in funny places that are hard to get to, because the locals will not travel the long distance to the city. Planning is a long-term thing. It is a fundamental issue to do with fuel, oil and energy in transport.

Senator O'BRIEN—What, if anything, does your organisation think of the prospect of using liquid natural gas, for example, as a fuel in the rail sector? You do not have to have a view on that. I was just wondering if you do.

Mr Michell—I am not an engineer, so I can say all sorts of things that others cannot, but I think that in any transport organisation, be it road, rail, sea or whatever, you want to get a reliable supply of fuel that will cost—in total whole-of-life cost—no more than you are paying now, and preferably less. It comes down to that—that if natural gas can run in a diesel type engine and work successfully and cost less, and if the storage and everything else does not create a lot of imposts that you do not want to bear, then it will happen. It is the same with biodiesel, I would suggest.

Senator O'BRIEN—Cummins manufacture engines now that run on natural gas.

Mr Michell—I think there is a fair bit of evidence that the smaller engines—I am talking about bus- and truck-sized things, which do appear on rail systems in some areas—can run on all sorts of interesting fuels. I am not sure about the bigger stuff, the sorts of things that you find in ships—those monumental engines that practically require an army to put them in the ship and which will never come out again. I am not sure what they run on, but I think it is more difficult for them to go into using alternate fuels because they are so big and there are such huge forces involved in terms of the engine that if you change the impact of the fuel slightly you are in serious trouble if you have the wrong mix. I think diesel locomotives are in that category; they have quite large engines.

Mr Honan—I would like to make a point about different technologies and different fuel types. Overseas, gas turbines in passenger trains have been experimented with; I am not too sure whether they have been successful. I think from the RTSA's point of view it is not so much about the technology of converting fuel into energy or the calorific value of the fuel; it is more about the overall demand. We see that the demand for freight and the efficiencies within the rail system or the transport system are such that there can be very significant gains for oil conservation rather than changing different types of fuels. We see that as a major driver for fuel and oil conservation.

Senator O'BRIEN—Can you explain your argument about electrification versus diesel rail?

Mr Honan—Electrification appears to be more intensive; it is much more efficient in terms of energy. The problem with electrical systems is that they obviously require a coal-fired power station to generate that—

Senator O'BRIEN—Or gas.

Mr Honan—and that throws up a lot more environmental issues. Certainly, in terms of overseas experience, high-speed rail or rail systems in general are electrified, but in the Australian context the only electrified freight system is the Queensland rail system. In fact, in New South Wales they pulled out the electrified system some decades ago and started to use diesel.

Mr Michell—I think there is an issue with electrification in this country because, apart from Queensland and the Perth suburban area, the electrification system is antediluvian. Melbourne in the 1910s was the first place in the world to have a proper system with 1,500 volt DC electrification. Good old Melbourne won again. But we still have that in both Melbourne and Sydney; it is kind of institutionalised. Because it is low voltage, when you get high current you get real trouble with the size of the wire you need. The heavier the wire that you need for the high current the heavier the structures you need, and all that costs big money. I well remember when they used to run electrically hauled freight trains between Sydney and Newcastle. On a dewy morning, with a three- or four-loco train running up the hill from the Hawkesbury River to Cowan, the overhead wire would be literally steaming afterwards because the high current draw would have heated up the wire to the point where the dew would be starting to steam off it.

In Europe and in Queensland where they use 25,000 volt AC you get much lighter structures, but there is still a limitation on how much you can deliver through a wire to a locomotive somewhere out in the scrub. It is the old joke about a very long cable, but that is exactly what it is, whereas a diesel locomotive is self-contained to the extent that you do not need to rely on external energy. And what you can do with a diesel locomotive is much more predictable and there are no limitations on going to higher horsepower, other than the fact that you have got to fit it in the locomotive in the right weights and all that sort of stuff. An electric locomotive is very dependent on the electricity supply system in total and certainly in this state that is a very significant limitation because of the type of electrification. So there are a number of issues there which I think are quite important.

The other thing, of course, is that you have got to pay for everything above rail level—structures, overhead wires, substations and control systems—and that is very expensive stuff. It is all right when you have got high-density passenger stuff or high-speed where you want a lot of energy, but it is not much chop when you are trying to run a freight railway in general. Not many freight railways do.

Senator MILNE—To follow up on the electrification and the high-speed links, you were suggesting that it might be time for a review, given the high cost of oil and the increased use of aviation fuels, and that maybe there will come a point when that makes it economic. Given what you have just said about the costs of putting in a suitable electric system to support high-speed rail, have you looked at whether the passenger numbers would justify costs? Would it be viable in Australia given the Sydney-Melbourne-Canberra—

Mr Michell—There have been a number of studies—and there was a very significant proposal about five years ago—and some of those studies came up with passenger numbers that should make it viable. But the assumption that had to be made was that airfares and the cost of driving yourself remained constant and, as we have seen, airfares are anything but constant. Although fuel prices have gone up very substantially in recent times, airfares have not in real terms gone up at all. There are more cheap fares now than there ever were. I think it is a truism to say that the air system, which has been largely privatised—and I am talking about the worldwide system—has got a very self-destructive mentality about it. The number of bankruptcies in the air industry far exceeds the number of active airlines. They tend to crucify themselves going into cheap fares and cutting fares. I think you would find that the same thing would happen if there were a high-speed railway built. I am not saying that it should not be done; I am just saying that competitive stresses coming from an approach by air that says, 'We need to survive,' would not

get you the numbers you need without some other sort of driving force behind it. Congestion at the airports, for instance, would be one.

Senator MILNE—And the cost of putting in new airport runways and all that.

Mr Michell—That is almost as prohibitive as building a high-speed passenger railway.

Senator MILNE—On the issue of market failure, you would have to argue that the current airline pricing mechanism is a case of market failure. What is your opinion of the recent decision by the transport ministers not to proceed with the heavy vehicle charges as were recommended by the National Transport Commission? How has that impacted on the capacity of rail to get this shift that we need to occur to achieve the fuel efficiencies that we want?

Mr Michell—Personally, I was very disappointed by it, firstly, because I think it was a really weak-kneed approach to life and, secondly, I believe that in the road area the problem at the moment is that we have got heavy freight vehicles—articulated trucks, B-doubles, road trains and even B-triples in a couple of places—being subsidised by their mates with smaller trucks and people with cars. My little Peugeot subsidises some clown on the highway with a B-double who insists—

Senator STERLE—A clown?

Mr Michell—Yes, he tailgates me. You go up around Grafton and see how many will not tailgate you up there.

Senator STERLE—Okay, so there might be one bad element—

Mr Michell—No, not one; I had six in a row. I think the thing about the fuel issues there was that there was an unwillingness to deal with the road pricing issue at all. It is not that fuel has not gone up; it is not that the costs of roading have not gone up or the costs of road construction have not gone up. Construction costs in this country suddenly escalated because of the high demand. But we say no, we will keep it at the same level. It is a total nonsense and, quite frankly, if the Productivity Commission does not come up with something really worth while, that is adopted, I think that we missed the ball altogether.

Senator MILNE—As far as the infrastructure and regulatory measures that need to be put in place to allow the shift that we would like to see occur—one of them you have just talked about is obviously that the Productivity Commission may come up with some recommendations on the regulatory environment—what about the infrastructure? Who do you see paying for it, seriously?

Mr Michell—I think that there is an imbalance in this and I think that there are two ways it can be dealt with. Roads are complicated because they have motorists on them and they have commercial activity both passenger and freight, but particularly freight, amongst which there is a very wide range from the taxi-truck level right up to extremely heavy vehicles. How much of the wear on a concrete road pavement that is 10 inches thick is attributable to one group or another is a pretty unhelpful argument, albeit it is quite obvious that most of it is associated with the heavy vehicles. My feeling is that you can go two ways. Firstly, you can try to set up a system that mimics what is going on in rail where the operators pay for the full maintenance cost and

some capital cost of the rail system. You can go the other way and say no, basically governments will provide the capital for the infrastructure and the users will pay for the maintenance of that infrastructure, and I think that is probably the more helpful route to take.

In other words, we need to adopt a road pricing mentality on rail. Given that rail, as is fairly well known, has fairly wide external values such as savings in greenhouse gases, in road trauma—there is far less trauma on rail than there is on road—and all sorts of things like that, a lot of the value of the rail line is never captured by the fare box of the rail operator or the rail owner. By going into some government funding of the capital side of rail, for instance, you are saying that the government is the only one who can capture all those benefits and make the judgments on all these things that are wider than just a transport system, and allocate its funds accordingly. The AusLink system provides the sort of mechanism to handle that if it is done equitably. So I think that there is probably a good argument to say that road pricing needs to be sorted out, particularly pricing differential between the heavy end and the light end of the commercial market. But beyond that I think you could argue that the rail should be done on a similar basis in some way, such that the rail and the road are then judged on their relative merits in terms of a whole lot of government priorities, including fuel conservation, trauma, greenhouse gas and so on.

Mr Honan—We have reviewed some of the submissions to the Productivity Commission for its report and it is clear in terms of pricing for infrastructure that the ARTC has to charge a user charge for the infrastructure that covers the capital cost that has already been spent, as well as making provision for future capital expenditure on infrastructure. If you look at the road system, they call it a pay-as-you-go system whereby the excise is really justified as the basis for spending on roads. So in that sense the two modes are inconsistent. We would like to see a rational and balanced approach to it and we think that that will be better for the Australian transport task.

Senator JOYCE—Unfortunately, for every so-called clown in a truck there are just as many if not more clowns in cars that create the same problems. Those people in trucks are there because they are trying to make a buck, not because they are trying to upset anybody. I would like your comments on the AusLink outcomes. Do you think that the government policy on AusLink is doing the job or is it insufficient? Where is it?

Mr Honan—It was a good start, but we tend to agree with some of the submissions coming through at the moment that say it is in jeopardy of being hijacked in many ways. I think it was meant to be an open, transparent and rational decision about infrastructure provision. We saw lots of discretionary spending going towards certain areas which we could not understand. We would like to see it strengthened, particularly with regard to planning and balancing, with a more open approach to the different modes. I think that it is on the verge of not delivering the expectations people have of it.

Senator JOYCE—What are those expectations?

Mr Honan—The expectation was that we would see a rational approach and that road and rail pricing would be tackled as part of AusLink. That was not the case. We thought that there would be much more planning on the major corridors—and that is starting to occur but only slowly—

and that there would be some more regional effort in terms of rail and road corridors. At the moment, we think it is disappointing.

Mr Michell—One thing on that, Barnaby, is that it would be very useful, I think, if the AusLink concept was also adopted by the states. The regional stuff and some of the things you are talking about in Queensland, for instance, are within the domain of the state. If they were to mimic what was going on federally with AusLink then we might get a relatively compatible set of planning guidelines and approaches to transport that would fit together. At the moment, we are in danger of having nine systems going—a federal one and then something else going on within each of the little domains that is not necessarily compatible.

Senator JOYCE—A better juncture between federal and state planning would be a big assistance—is that right?

Mr Michell—Yes. There is a fair bit of cooperation on the federal stuff. You can understand why: the states get given federal money and they are only too willing to cooperate. In terms of their own activity within the states there does not seem to be the same basis for allocation of funding or even attention to what is going on.

Mr Honan—I would like to highlight one of the programs that AusLink supported. The strategic regional transport plan—some $129 million—was announced just prior to May. That was a program that the federal government put out to the regional councils. The regional councils were to come forward with their proposals for integrated transport projects and the federal government would partly finance those projects. The issue in this regard is that the capability of local councils is really in roads. They are stacked with road engineers. They have little capability of understanding an integrated solution. Under the guise of the title 'strategic regional transport plan', the program has, in fact, a bias towards road solutions because of the capability within local governments. There is no rail understanding within local governments. That rail understanding was with the state governments and jurisdictions. They have retreated from that. Basically, what you have are councils that are strong on roads and local government areas. Expecting them to come up with integrated solutions for transport, I think, is just inappropriate.

Senator JOYCE—You have led right to my next point. We already have on the record that there is a disjuncture between state and federal planning for the development of rail infrastructure. However, I wonder if there isn't a better way to include regional councils as part of the solutions. I agree with what you were saying before, but I think a proactive approach is needed whereby regional councils are actually shown the advantages of getting heavy transport off their roads and onto rail. I am thinking of one instance where this issue has been completely turned around on its head. In southern Queensland at the moment we have the state government paying the local council an extra $20 million because they are going to tear up the railway line so that they can put all the heavy transport—all the wheat—on the road to wreck the road.

I find regional councils are better deliverers of services. If they can deliver it on roads, couldn't there be a proactive approach to getting them to start to deliver it on rail? That way we can deal with some of these issues we keep coming across, which are the internodal issues. It is so focused on long haul that it is losing internodal intrastate operation and therefore not optimising the capacity on the rail.

Mr Michell—I think you are right. There are examples in New South Wales, where the state government are not showing a lot of interest, to put it kindly, in rural branch lines that predominantly serve grain. Once again, that is a rail problem, that they do not go out after the other traffic that exists there. But, by being disinterested in the rail, they are effectively shovelling the financial risk from the state level down to the local level, and the regional councils now have to fund the roads because the roads are getting broken up. They were never designed for what is now being carried on them, because the railway used to carry it. You are quite right: there needs to be an approach that brings the local government into the transport planning equation. It is a bit like the old argument about whether you should subsidise children's education or give the parents some money and say, 'We'd like you to use it on education but if you want to buy smokes go ahead.' It is that sort of approach. In other words, you provide the funding and the background and so on but you do not actually tell them what to do with it.

Senator JOYCE—This is a complete change in dynamics, but is there any reason at all why the federal government could not go straight to the regional councils and say, 'Here is a bucket of funding for you to do up rail—only rail'? What would be wrong with that?

Mr Honan—That is a good outcome, but the problem is that they do not have any capability. They do not have understanding of rail and they will take time to develop it. We went on a study tour just recently for the Neville inquiry on branch lines and found that the local councils are denuded of rail experience; they have no understanding of rail. They do not understand the infrastructure; they do not understand the operations. They want to be involved in it. They would dearly love it; they have a moral affinity towards rail. In our submission to the Neville inquiry we highlighted the Saskatchewan model, where a facilitator within the provincial government facilitates short line and branch line operations.

Senator JOYCE—We have proved something this morning—that is, rail will not work efficiently until it deals with short haul, because it will not get the traffic on board, and if it does not get the traffic on board it will always run second to roads. Once people put things on a truck they leave them on a truck. It will not work at a local level because the state governments have no idea about how to deal with local government issues. Therefore, we have to get local government involved in rail. Not having somebody there with the knowledge means making sure that the impetus is to get the federal government to inspire the local government to get the people with the knowledge. There has to be a front-end loading mechanism for getting the rail infrastructure working. If we just say, 'No, that's too difficult; we can't do it,' it will not happen.

Mr Michell—It will disappear, in fact.

Senator JOYCE—You heard before about the issues around borders. I know there are different gauges, and we have an immense amount of road transport, especially on the Newell Highway, which is out of my state but which heads up into my state and ends up out west in Queensland, with traffic tearing up and down. I will propose an issue to you: I think that this has never gone anywhere because of a form of parochialism that is driven by people wanting to supply goods to their ports, as opposed to supplying the best outcome for regional roads. Do you want to comment on the idea that possibly people, quite knowingly and with malice of forethought, are saying, 'I don't want to fix up this rail transport because I want all the goods to be going down through my port in Sydney, as opposed to a port in Darwin or in Gladstone'?

Mr Michell—There has been an interesting series of articles in a magazine called *Railway Digest* over the last year or so, with an argument very much like that, going right back to the century before last. My feeling is that these days it does not work. At one stage, QR wanted to gauge-convert the track from Boggabilla down to Moree to narrow gauge and make it a branch line from Goondiwindi. This comes back to what you were talking about before.

Senator JOYCE—It is ridiculous; it just gets there and stops.

Mr Michell—The New South Wales authority's approach was to say:, 'Narrow gauge in our state? Over our dead bodies!' The thing is that they are not getting any traffic much from that area into the Newcastle or Sydney ports because it goes by truck to Fisherman Islands.

Senator JOYCE—That is right. And once it is on a truck, it stays on a truck.

Mr Michell—Exactly. The break of gauge and the rail parochialism, where borders meant almost new countries, does not exist on road and never has, and therefore this logic does not apply anymore. I think the real problem with the concept of an inland rail route is that most of it is fairly cheap because the rail is there. You need to improve it; you need to do some deviations and so on. The big bit is Brisbane to Toowoomba.

Senator JOYCE—To get from Toomelah up to, for instance, Thallon would not be a huge engineering feat. I think we have done more than that in the past.

Mr Michell—No. In fact, you could go out to Millmerran and from there literally lay the railway on a line down to Inglewood or somewhere and not have any major earthworks at all; it is beautifully aligned. But to get from Brisbane to Toowoomba would take big money, and the longer people fiddle-faddle about it the more the area of Brisbane becomes difficult to get through as well; that is extending outwards quite rapidly. I think, though, that something will come of it. There is a land reservation at least in the Grandchester to Gowrie section, but I am not sure what is happening in Brisbane. I do not think anything definitive has happened yet, which is one of the hold-ups. But to the extent that you can influence that, by all means do.

Senator NASH—You mentioned rural rail and the grain lines before and you were saying that the government was not showing a lot of interest. I am looking at this from a New South Wales perspective, since that is what I know, and there has obviously been a real decline in those lines in New South Wales. Is it just because of a lack of funding from government, or is it that they just stop being competitive in terms of shifting grain? Are we looking at it through rose-coloured glasses to think, 'Yes, we should be putting money back in; we should be getting those grain lines going again'? If those lines were up and running would they be competitive?

Mr Honan—I think they are. If you look at bulk haulage of grain, it is really crazy to do it by any way other than rail. The issue is that it is seasonal; it is only three months of the year. And they need to have an integrated supply chain—it needs to be integrated from the farm gate to the local silo to the transport link on rail to the port.

Senator NASH—What do you mean when you say that it needs to be integrated from the farm gate right through to the port?

Mr Honan—You have disconnects throughout the cycle. You have a grains handling authority, which is different from a rail authority, which is different from a port authority. If you look at the coal system in New South Wales and the Hunter Valley—or, indeed, the Western Australian system—the partnership, the alliance, was formed for the whole of that chain. In Western Australia there was a big push to have the growers, the grain handlers, the transport operators and the port authorities all in alliance, talking and working out the overall efficiencies within that logistics chain. That does not exist in New South Wales in terms of grain. So you have people like GrainCorp or AWB setting up silos. There is competition in that area where the grain handlers are. You have competition within the ports. In some cases, AWB owns a port; they want to see their grain go to their particular port. So there needs to be an integrated approach to it all. In Western Australia, for example, they found out that they should not be spending money on the rail system; they should be spending money on the port—the out-handling system—because that was the thing that caused all the bottlenecks within the chain.

Senator NASH—It is difficult when there are so many competing interests, I guess. Have you got any work, or have you done any work, that the committee could have on different examples? For instance, an example of a farmer using a truck from, say, silo to port, or a farmer having to use truck to rail, rail to rail then truck to port again if the rail does not go straight to port. Have you got any comparative work of that sort that we could have?

Mr Honan—We conducted a branch-line tour from 22 to 25 March of this year for the Neville inquiry. As part of that work we did research with the Grains Industry Advisory Committee, chaired by Vince Graham, and also the New South Wales Farmers Federation. We have that research. So there is anecdotal evidence about the capture area of a truck, how far a road based system should go before it goes to a railhead and then the competitive advantages of rail to a port. We do not have that specific information that you have requested but we can certainly give you information based on the report that we did to the Neville inquiry and also the results of the study tour of the Riverina and south-western New South Wales.

Senator NASH—If you could supply that to the committee that would be great.

Mr Michell—One of the things with grain is that in the main it does not go to port by truck. There are some areas, like into Esperance, where there are only two silos on the rail and where there has been a lot of recent land clearing and development peripherally around Esperance, so it is all by truck. But in the main it is all about whether you load the grain near the farm on the branch lines or whether, by all sorts of means, you force growers to cart their grain to a silo and a storage system which is much bigger and more efficient but located at less frequent intervals, so they might be doing 100 or 150 kilometres to deliver the grain to a silo. But in all cases the silos are basically storage systems. They hold the stuff, and it is run down to the port as the sales happen. It will take almost a full year for it to run down in a normal season. In some good seasons it sits there for more than a year. You get these bunkers and things that are created that just hold the grain for as long as it is needed. So there is not quite the same competition between truck and rail on the branches. There is always going to be delivery off farm. It depends on how you set the system up as to how far the poor bugger on the farm has to cart his grain.

Senator HEFFERNAN—In New South Wales how many farmers would have to go 150 kilometres before they hit the silo?

Mr Michell—Not many, I think. But what happens is, for example, with the Tottenham line, they say, 'Okay, Bogan Gate now has a major receiving facility that has been provided by AWB as part of this competitive thing,' and they drop their price at that point by $3 a tonne. The guy will drive at least $3 worth of trucking cost further than he would have before to get the same result with his grain. I do not know how far that goes.

Senator HEFFERNAN—It is a bloody con job. For instance, GrainCorp has the facility in Junee and AWB have the facility at Stockinbingal and they will subsidise the truck freight across—covered up through the pool, that wonderful thing that covers all of the mistakes that everyone makes. This is all a part of the competitive thing, which does away with the thinking that you would take it to Marinna, where it will take an hour and a half to unload a B-double in a very antiquated system, whereas you can drop it in three minutes at one of these bigger silos that operate 24 hours a day. To think we are going to go back to the horse and dray is dreaming. Let us face it: the state government have conned the federal government in the branch line episode. They had no intention of ever bringing them up to pace. They thought, 'We'll get rid of them; that's their worry,' and that is exactly what has happened.

Mr Michell—On the issue of branch lines in New South Wales, from evidence in other places, South Australia and Victoria particularly, the actual infrastructure that is there, the rails and stuff that are there, even though they are lightweight, can be used for much heavier trains than are currently allowed to run provided you fix up the culverts and underbridges—and there are very few of those in most of the grain branches because, by definition, they are out in areas that do not have rivers, gullies and valleys and all those sorts of things.

Senator HEFFERNAN—But with modern headers, which are tearing it off at a rate of knots, you cannot muck around. You cannot go with a truck to some silo—I will not name anyone; I might offend them—where it takes hours and hours to unload with an old elevator.

Mr Michell—I agree wholeheartedly.

Senator HEFFERNAN—And they are not going to work 24 hours a day. You would fill it in 24 hours, if you had a fair dinkum shot at it!

Mr Michell—Exactly. On the issue of these silos, I would see fewer silos, strategically located where the road network feeds, and at reasonable intervals. In Victoria 20 years ago a reasonable interval was determined to be about 30 to 40 kilometres. Previously it was about eight to 10 kilometres.

Senator HEFFERNAN—Once you put the freight in the truck at, say, $10 or $12 a tonne, to take it another 20 kilometres is bugger all.

Mr Michell—It is the speed of off-take. If your truck is going to sit at a silo for four hours, you could drive a further very large distance—

Senator HEFFERNAN—It does not suit the carrier, it does not suit header driver.

Mr Michell—You finish up stopping your whole farm production process.

Senator HEFFERNAN—That is why the Cobb & Co horses used to have a five-mile stop and have a rest.

Mr Michell—I think the branch lines could have major facilities put on them, because they are not as bad as everyone thinks. They have to be brought back to standard, but they—

Senator HEFFERNAN—But it is a question of who is going to pay to do that.

Mr Michell—Yes.

CHAIR—I think we could be talking for quite a long time about the intricacies of this one, but we have now run over time. Thank you very much for your submission. Committee members have asked for information on a couple of things. If you could send that to the secretariat that would be much appreciated.

Proceedings suspended from 10.40 am to 10.55 am

MILFORD, Mr Bernard John, Senior Manager, Policy, Australian Canegrowers Ltd

CHAIR—Welcome. These are public proceedings. The committee may agree to a request to hear evidence in camera or it may determine that certain evidence should be heard in camera. All evidence to the committee is protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence, and that may be held as contempt by the Senate. It is also contempt to give false or misleading evidence. If you object to answering a question, you should state the grounds on which you object and the committee members may decide that they want to insist on your answering the question. If they do so, you may request that the evidence be given in camera. I now invite you to make an opening statement.

Mr Milford—From Canegrowers' point of view, we believe that ethanol is an important component of future fuels in Australia. We support the development of an ethanol industry and, for a number of reasons which I will come to, we support the further development of that industry in regional Australia. I will not go through the whole detail of the paper. In it, we discussed the competitiveness of ethanol. I think it is fair to say that ethanol from sugar cane is reasonably competitive with petrol at the present time under the current excise regime and the current fuel costs. However, looking at longer run projections of costs, for an ethanol industry to become established based on sugar cane—and I will explain in a minute why I make that distinction—we believe that there is a need for some support. We want to propose the way in which that support should occur.

It is interesting to note that, since the paper was prepared, there have been significant announcements of investments in biofuels in Australia, particularly from BP and others. In terms of ethanol, which we see as the particular fuel of interest to cane growers, it still requires some significant support before it can be seen as a totally competitive fuel in the long term. When I say 'in the long term', I mean over the life of a plant, which I am taking to be 20 to 25 years.

Noting the increased number of announcements of potential projects in the biofuels area based on biodiesel or conversion of fats and oils into diesel fuel, I want to make the case specifically for ethanol. It does have some specific roles, particularly in particulate matter reduction in the urban situation, given that such a large proportion of fuel use in the urban areas is petrol or gasoline use, which is the one that is miscible with ethanol.

From Canegrowers' point of view, we see four main pillars for support of ethanol. The first is the environmental and health benefits, with the environmental particularly relating to the greenhouse gas reduction potential from the use of ethanol and the health benefits relating to the reduction in air pollution and particularly, as I say, particulate matter. However, I grant that that is not a totally open and shut case, as there are issues to do with volatility of hydrocarbons which one can argue may have a negative environmental effect. It is probably beyond my scope to argue those points down to the finest detail, but I think we would make the case that we can argue quite strongly against a number of the objections to ethanol in those sorts of terms.

The second is fuel security, which, of course, is an important issue and one I know that your committee is tackling. Clearly, domestic sources of fuel improve Australia's fuel security, and we see ethanol as having a role in that.

The third is the effect on regional employment. One of the strongest experiences in overseas countries, particularly in the Midwest of the United States, which has led the way in the development of fuel ethanol in a farm situation—I contrast that with Brazil, where it is more of a plantation situation—is the effect of the development of ethanol industries on regional employment. It has been one of the most significant and positive benefits of that sort of industry. That is another reason for our support.

What I have not put in the paper but from Canegrowers' point of view has been a developing view is the development of an industry for fuel ethanol. I am using, I guess, what an economist might call an infant industry argument. The development of a fuel ethanol industry will have enormous potential for further downstream development. Once you have a molecule of ethanol, you can convert that into plastics precursors. Once you have plastics precursors you can make plastics. Once you have plastics, you can make toothbrushes. It is very simple stuff, but the point is that at each step in the transformation any price differential that ethanol may have against a fossil fuel becomes a smaller and smaller proportion of the final value of that product. I am not saying that we should suddenly build toothbrush factories in northern Queensland around sugar mills; I guess what am saying is that the establishment of ethanol industries creates the precursors for these downstream developments not just in terms of the products but in terms of expertise, capital investment, and understanding and potential for these further developments.

They are the main points we would make as to the benefits. The paper does not deal specifically with the issue of fuel duties. Canegrowers notes with some concern—it would be perhaps a bit strong to call it alarm, because the issue of the change in fuel duties has been on the table for quite a while—the timing. Our position is that the period between now and 2011, when the current effective duties on ethanol change, is a very short period. We would urge in any forum that is appropriate that consideration be given to an extension of that period to allow for investment to take place. At the present time an investment that meant a commencement of a factory for producing ethanol in 2007—

Senator HEFFERNAN—Are you talking in reference to sugar?

Mr Milford—No, not the sugar levy.

Senator HEFFERNAN—No, I am talking about ethanol production from sugar. Are you referring to that?

Mr Milford—Yes.

Senator HEFFERNAN—Aren't you priced out of it at the present time?

Mr Milford—At the present time, no, I would maintain.

Senator HEFFERNAN—Sugar is being used for sugar at the moment.

Mr Milford—Yes. At the present time I believe that ethanol from lower value sugar streams in a factory or, potentially, the higher value streams in the factory would be competitive at prices around $60 to $70 a barrel and exchange rates about the 75c mark.

Senator HEFFERNAN—And what price for the sugar?

Mr Milford—Fair question. Yes, I guess I am basing that on a historical run of prices at—

Senator HEFFERNAN—Well, you are dreaming, because—

Mr Milford—around the $250 to $350 mark. At the present time we are seeing a bubble in the sugar price. How long that is going to last we have no idea.

Senator O'BRIEN—That is because of the Brazilians' diversion of their crop into ethanol, isn't it?

Mr Milford—To a certain extent. There are a number of factors acting in the world sugar market at the moment but that is certainly one of them, and the linkage that has arisen in the last few years between the sugar price and the oil price.

Senator HEFFERNAN—Which is why CSR said that they are not interested in ethanol production unless they can be globally competitive to deal with that.

Senator JOYCE—So sugar is becoming ethanol, just not Australian sugar.

Mr Milford—That is right. And that, I guess, leads me to my final point for this opening address, the issue of imports of ethanol that will take place under current plans when the changes in the fuel excise occur. This is an interesting one for an organisation such as ours which has been very strongly supportive of free trade and open markets. Particularly in the sugar area, we have seen dire results of closed markets in a number of areas. Just last year we and our Brazilian comrades and our Thai friends took an argument to the WTO that the European sugar regime violated WTO rules. We won that argument. That was a significant victory. So our attitude to imports is that imports should be allowed at some point and that if the timing of the introduction of changes in the excise is appropriate that may well be an appropriate time for the introduction of imports. But we would still maintain, using the infant industry argument I mentioned before, that there should be a level of protection for the ethanol industry in Australia so as to allow an infant industry to build up and be able to face those sorts of imports.

Senator HEFFERNAN—But aren't you arguing there against the better interests of sugarcane growers?

Mr Milford—In what way, Senator?

Senator HEFFERNAN—If you want to subsidise in some way Brasilia, we cannot compete with Brazil. There is nothing to talk about there. But we have heard arguments at this committee about why the lot feeders do not want an ethanol industry because they do not want the poor old bloody wheat cocky to get the maximum value for his wheat, and I think your argument is that sugarcane farmers should not get the maximum value for their sugar. If you are going to get maximum value for sugar you will not be using it to make ethanol—forget about it. So if the alternative for you is then to say, 'Well, we'll import it instead,' I'm going to tell you to go to hell!

Mr Milford—The decision as to what feedstocks would be used in an ethanol industry has to be one that would be based on somebody's assessment of the current market, sure—and in the case of sugar it is quite buoyant—but also of the future market because we are talking about a 25-year life of a crop. At the present time there would be no cane grower in Queensland who would sign a contract that said that they would supply an ethanol plant that gave the equivalent of, for argument's sake, 80c or 90c a litre, or something like $US70 a barrel and working backwards from that sort of price, because they see over the next few year or two that the prices are very buoyant. However, I am not looking at that short time period. Historically—

Senator HEFFERNAN—But neither are we. Brazil is not about to change its ethanol policy. Surely part of the economics for Australia of a globally competitive ethanol industry is what happens downstream from the ethanol plant, whether it is a 5,000 cow dairy or whatever. But I would urge you not to put a proposition to anyone that somehow dampened the sugar market, in the way the lot feeders are trying to dampen the wheat market.

Senator JOYCE—I do not think he is doing that. He is talking about the vagaries in supply, and at a future date—

Senator HEFFERNAN—He is assuming oversupply in the longer term.

Senator JOYCE—as the price falls over, people will go into a long-term contractual position, which would make it all very viable, wouldn't it? The sugar market is a very volatile market, isn't it?

Mr Milford—The sugar market is the most volatile commonly traded commodity in the world.

Senator JOYCE—And 80 per cent of our production goes into that volatile market, doesn't it?

Senator HEFFERNAN—The price we nominate for canola oil is $800 a tonne. At what price do you lose viability? At what price do you have to buy your sugar to make an ethanol industry viable in Australia today?

Senator JOYCE—What day are you referring to, Senator Heffernan, today or a year ago?

Senator HEFFERNAN—You must have a cost of production, based on sugar, for ethanol. What is it?

Mr Milford—If I had an equivalent sugar price of $A300 a tonne it would be viable for a cane grower to produce sugar cane to go into ethanol, which would result in a price for ethanol of around 80c to 90c a litre. I am making a couple of jumps there but, under normal circumstances—and I think everybody in the sugar industry expects 'normal' to come back in a couple of years time—a long-term contract of around $300 a tonne would be sufficient for me to commit to producing sugar cane that would go into ethanol. Therefore, if the price of around 80c a litre at the factory gate for that ethanol were competitive, that ethanol—

Senator HEFFERNAN—How much subsidy do you want built into your production cost?

Mr Milford—No. That is—

Senator JOYCE—Something similar to the US, maybe.

Senator HEFFERNAN—That is the one we have been looking for. You are saying that sugar cane at $300 a tonne is a goer?

Mr Milford—If that is a number the committee is looking for, I would like to review that number and come back to you.

Senator JOYCE—I would not be held to that number. There are things out there, as you know, such as ethanol from the lignum from the cellulose structure of the plant, which has nothing to do with sugar. So do not get railroaded into a corner.

CHAIR—It would be appreciated if you could provide an update on those figures.

Senator JOYCE—I want to touch on a few things. The Americans are producing 3.2 gigalitres of ethanol. Are they mad? If it is a bad thing to do, they must be terribly foolish people. What is driving the American production of ethanol?

Mr Milford—Why would you ask me if that is a bad thing?

Senator HEFFERNAN—He is being facetious.

Senator JOYCE—Yes, I am.

Mr Milford—What drives production in America is legislation.

Senator NASH—I am so shocked!

Mr Milford—And, surprise surprise, tariff barriers. There is a patchwork of legislation throughout the United States at local, state and federal level. Mostly at the state level there are mandates relating to the level of oxygenates in fuel, of which ethanol is in general a very economic competitor.

Senator JOYCE—What are they trying to achieve from this? Why would they be going down this path? What is the nation-building idea they are trying to achieve from producing ethanol?

Mr Milford—I come back to the four pillars that I touched on before: health, environmental grounds, regional employment and fuel security. I think those things are what a state legislature in Minnesota or a congressman in Washington would be looking for when they are putting through this legislation.

Senator JOYCE—Perhaps a senator from Minnesota—if he were an Independent. They produce 13.2 gigalitres of ethanol. Our total production of fuel in Australia is about 18 gigalitres, isn't it?

Mr Milford—That is right.

Senator JOYCE—So they produce almost as much ethanol as we produce fuel?

Mr Milford—My numbers are probably a bit behind the times. If you look at the commitment to new capacity, it has exceeded our use of petrol.

Senator JOYCE—From your knowledge of this, with 13.2 gigalitres of ethanol being produced has the cattle industry in America collapsed? Are they all going broke? How is the cattle industry faring in the United States?

Mr Milford—I am afraid I am not able to answer that one.

Senator HEFFERNAN—But can you answer what is the actual cost in Australian dollars of the produced ethanol?

Mr Milford—No, I cannot.

Senator HEFFERNAN—That would be very helpful. This is meaningless unless you put some numbers to it.

Mr Milford—I do have access to some papers that could answer that question.

Senator HEFFERNAN—You might provide them.

Mr Milford—I am happy to come back to you on that.

Senator JOYCE—I notice in your paper you talk about the EU and the United States having a prohibitive tariff structure to protect their ethanol industry and to get it up and running because of its nation-building aspects. Can you explain to us what you see as the change in excise arrangements in 2011 and what they will do to our domestic ethanol production, considering the world market?

Mr Milford—If I were looking to invest money in an ethanol plant at the moment, I would have to take into account the fact that in 2011 that excise will come in. Therefore, if I started a plant in 2007—and I have done this calculation so that I can understand what these things really mean—effectively I would be facing an 8c tariff over the 25-year life of the plant, given that I have a few years of zero tariff and then a ramping up of that tariff from 2011 to 2015. That clearly is a number that I would have to take into account when doing the economic analysis. If I am facing a cost at the factory gate of 70c to 80c and I have to add another 8c to that over the life of the plant then I have a more difficult economic hurdle to leap than if it is not there.

Senator JOYCE—What is the terminal gate price for ethanol at the moment? Is it about 80c to 85c?

Mr Milford—That would depend on the current price of molasses, which I am not privy to. My understanding is that it is probably about 70c a litre.

Senator JOYCE—You might not know this, Mr Milford, but I want to cast something out there and see how it swims. Ethanol is about 70c and the terminal gate price of fuel is about $1.40, so there is obviously a great financial advantage, seeing it is a cheaper product, to blend it and get it out there. Do you have any suggestions as to why the oil companies would not want to be more proactive in trying to get this cheaper product out there when, even if they split the difference with the motorists, they would get a financial windfall out of it?

Mr Milford—I guess that is a puzzle, and I cannot really comment on the sales programs of—

Senator JOYCE—It is a big puzzle to me.

Mr Milford—There is one important point to make, and one that is unique to Australia: when Australian motorists are asked if they would like to use ethanol in their vehicles they are extremely negative. Something like 35 per cent say that they are unhappy to buy fuel that has 10 per cent ethanol in it, and 21 per cent have doubts about buying it.

Senator JOYCE—Who promoted that campaign to not buy the product that competes with oil?

Mr Milford—I really cannot answer that, but I guess the number of signs that one saw a year or so ago that said, 'There is no ethanol in the fuel in this service station,' might give you some clues.

Senator HEFFERNAN—You can say what you like here and not get into trouble, you know.

Senator JOYCE—Which company was that? You can say what you like here under parliamentary privilege.

Mr Milford—Honestly, I cannot answer that. I think it was just about all of the oil companies that had some sort of—

Senator HEFFERNAN—Can I just come back to your molasses statement. We were given evidence in this room a week or two ago that, at the present price for sugar, molasses was not in the game for ethanol anyhow, so why are you still talking about it?

Mr Milford—Because at the present time—

Senator HEFFERNAN—It would not make sense to make ethanol out of molasses.

Mr Milford—There are still 60 megalitres of ethanol being produced, about 30 megalitres of which goes into fuel, at the CSR facility in Sarina. If you asked me for a price now, that is the sort of benchmark I would use.

Senator JOYCE—I need to clarify this because I know that there is some contention around this Senate committee. Let us work this out. In the past, 80 per cent of sugar goes into a world market that is corrupted. The only reason the industry is surviving at the moment is because Brazil are turning their sugar into ethanol because the price of fuel is so high. So we are, by

default, riding on the back of an ethanol surge that is linked to the high price of oil. It is just that we are having to do it second-hand through Brazil rather than directly through Australia. If prices in this commodity go down, do you envisage that people would be able to go into a long-term contractual basis on a more stable price footing in order to give themselves a better business plan to turn their sugar into ethanol? Would that be a possibility? In fact, would it be a likely outcome?

Mr Milford—That would clearly depend on the way oil prices move in the future and the excise regime that was put in place. I would certainly say that if an ethanol producer were able to offer me as a cane farmer—I have to qualify that I am not actually a cane farmer; I am an employee of the organisation—a long-term contract for the equivalent of $300 a tonne of sugar for my cane then I would think very seriously about signing it because that would give me the basis to go forward.

Senator JOYCE—So you agree with my proposition. I will extend it out a bit. If the price of oil goes up, does it become more or less of an imperative that Australia develop a biorenewable fuel industry—I would suggest that it should become more of an imperative—and if the price of oil goes down then the Brazilian demand for ethanol will reduce and therefore the price of sugar will collapse?

Mr Milford—I guess there are a number of assumptions behind that. One point to make is that the Brazilian fuel industry is much less exposed to the vagaries of the world price movements than ours, for instance, and that in other countries. There are controls on their fuel price, but there are also controls on their demand for ethanol. So even though their demand for ethanol will change at the margin, there is still a significant, if you like, momentum and backing behind that. Of course, there are other factors that will influence the price of sugar into the future. One of the factors in recent times has had nothing to do with the price of oil; it has had to do with the fact that the Europeans have been prevented from exporting something like five or six million tonnes of sugar into the world markets. About 40 million tonnes of sugar is traded, so you can see that it is a significant proportion of that. Other influences that you might see in the future would include, for instance, the Brazilians adopting GM varieties of cane that might give them much higher yields, so we would be looking at significant extra production from those sorts of sources.

Senator JOYCE—The Brazilians are right in front of the eight ball on this whole issue, aren't they? I have one final question. With the retirement of the cane lands in northern New South Wales right up to North Queensland, and given the economic benefit that the sugar industry has delivered to those areas, do you have any suggestions whatsoever about an alternate industry that would go there and deliver the outcomes to our nation that that industry has delivered?

Mr Milford—From the sugar industry's point of view, we have looked for diverse industries that might take over. The only near competitors for land in the recent downturn were forestry, which I suggest has some—

Senator JOYCE—Senator Heffernan is a big supporter of the forest industry.

Mr Milford—aesthetic and social issues attached to it, and cattle, which would be a very poor use of productive land. I can make one other point. You asked about the economic alternatives to

sugar cane. There is a strong environmental case for a sugarcane industry in coastal Queensland, and that was illustrated very strongly in the aftermath of Cyclone Larry. In the sugarcane areas that were so devastated by Cyclone Larry, the amount of run-off, erosion, movement of fertiliser and so on into the Great Barrier Reef lagoon was almost minimal. That was because of the farming practices that we have adopted over the last 20 years or so. I would make the case for the strong environmental credentials of the sugar industry.

Senator HEFFERNAN—Wouldn't Kununurra be a growth area for cane?

Senator JOYCE—We are talking about removing sugar from North Queensland. Maybe, for the assistance of the committee, you could go back and give us a history lesson as to why we developed cane in that part of the world.

CHAIR—That is going off the track, off the terms of reference, and there are other senators who have not asked any questions yet, so we will move on.

Senator JOYCE—Senator Heffernan goes all the way through!

Senator O'BRIEN—That is right, he does.

Senator JOYCE—Senator O'Brien then Senator Heffernan, then Senator Nash then Senator Heffernan, then Senator Sterle then Senator Heffernan.

Senator HEFFERNAN—Sounds pretty good to me!

Senator MILNE—Mr Milford, you asked why we would go down the track of an alternative fuels industry. Energy security is obviously the thing that is driving the US case, but the greenhouse imperatives are also going to drive the case very profoundly in the next decade. I am interested in life cycle analysis of ethanol from sugar cane. I am aware of the criticisms of the CSIRO life cycle analysis based on the Australian Greenhouse Office. I am also aware of more recent studies. I think CSR did one and Brazil has done some. I would like some comments in relation to that issue. Clearly, there are significant inputs to the production of cane which are petroleum based, so I would like to hear a bit more about your analysis of those life cycle consequences.

Mr Milford—One of the advantages of an ethanol industry based around a sugarcane factory is that the extra energy that you need, say, for distillation or for the operation of the factory itself comes from the sugar cane. So it is self-contained in that way. A sugar mill crushes cane and the residue from crushing that cane, the bagasse, is burned in the sugar mill boilers. One of my first jobs when I joined the industry a bit over 30 years ago was to design a boiler for a sugar mill. We had to be careful that that boiler was designed inefficiently enough that we could get rid of bagasse and get rid of the extra energy that was there. Nowadays, we are putting in cogeneration facilities. That has stopped because of the MRETs—but I will not get onto that subject! But there are significant benefits that a sugarcane based ethanol industry has in those terms.

Certainly, as you say, there are inputs, particularly nitrogen fertiliser, that are petroleum based. Clearly, there are significant amounts of diesel fuels used in the farming and harvesting. There are a number of ongoing studies into life cycle analysis. In particular, there is an ongoing PhD

study at Queensland University looking at refining the life cycle analysis in the Australian situation. More recent studies are certainly strongly positive. The question is: how positive?

Senator MILNE—In the long term, for energy security reasons more than anything else, the switch from food crops to fuel production crops is what is inflating the price now, as you have said. If that trend were to continue—and I will pose to you the opposite scenario to Senator Joyce's because I think it is a more likely one—wouldn't cane growers in the longer term be better off growing sugar for a food crop than for a fuel crop?

Mr Milford—I have to say that I have not given a lot of thought—

Senator MILNE—It is impossible to say at this stage whether food security is going to be undermined by a higher priority for energy security, in which case if Australian farmers stick with food production they may actually be better off. But, especially with competing alternative fuels which may well undermine ethanol from sugar—especially if the algae trials and other trials generate much better energy intensity—

Mr Milford—I will finish off what you are saying by adding ethanol from lignocellulose as well, which we all see as being the holy grail. We have been saying for so long that it will be in five years time. In my humble assessment, I think we are in the last of the five-year periods. Yes, that is going to be a difficulty. From our organisation's point of view, our argument would be: let us make sure that the options are open either way rather than predicting where the market will take us.

Senator O'BRIEN—I was going to ask about lignocellulose but you have answered enough of my question for me not to have to do that. One of the arguments about other alternatives—for example, LNG and CNG—is that they might be the pathway to hydrogen fuel. Wouldn't it be better for this country as a nation to pursue that pathway rather than the ethanol pathway? Isn't it the case that there is significant resistance from the fuel distribution network to ethanol which, in the short to medium term, is going to make the development of that industry that much more fraught?

Mr Milford—I will answer your first one as a reasonably well read chemical engineer, rather than as a representative of Canegrowers. There are two things about the hydrogen pathway. One is that there is still a heck of a lot of uncertainty about the ability to get that going within a time scale of, let us say, 10 to 20 years. Also, ethanol is not a bad precursor into that pathway. There is a fair bit of hydrogen around an ethanol molecule which you can strip off. It is not necessarily a dead end in that sense; it may turn into another way into that pathway. Sorry, I have forgotten your second question.

Senator O'BRIEN—It was about the barriers to ethanol being the distribution network.

Mr Milford—We are heartened by the public statements of a number of oil companies, and certainly BP has announced significant investment in biofuels and Caltex has been quite supportive of the E10 trials in Queensland. Yes, we are heartened by their comments. One point that I would make is that, like it or lump it, the oil companies have got strong control over the distribution network and therefore they are potential customers. We have to recognise the fact that they are customers, if not now at least in the future.

Senator O'BRIEN—Do we really need a government decision to promote the production of more ethanol friendly vehicles, such as the flexifuel vehicle of Brazil, to get the industry up and running here?

Mr Milford—Once again, we have not given a lot of consideration to that as a route for promoting ethanol. We have looked at the level of uptake of E10 at this point and have said, 'Potentially, if we had E10 throughout Australia'—a 10 per cent blend throughout Australia in one form or another—'that would create a level of demand which would have to significantly involve the sugarcane industry'—because there are just not other sources of feedstock.

Whether that demand comes from 10 per cent ethanol in every litre sold or from 10 per cent of every litre sold in one area and E85—the fuel for the flexi-fuel vehicles—is sold in another area, we do not have an opinion on that. We are looking at the overall demand rather than specifically at the blends or the ways in which that would get into the marketplace.

Senator O'BRIEN—Do you think ethanol blended fuel needs to be cheaper to make the penetration?

Mr Milford—I certainly think that a lot of the misgivings of the public about the use of ethanol would be alleviated by about 3c a litre. But I do not work for an oil company and so I cannot make that decision.

Senator O'BRIEN—We asked questions of Shell and BP yesterday, and it is either going into a fuel that is at the same price as unleaded or into premium fuels at higher prices. Do you think that gives ethanol a chance of growing?

Mr Milford—An independent fuel company in Brisbane have made the point of selling premium fuel at mid-fuel price and picking up the extra octane that it is getting through ethanol. Their forecourts are always full. They are not selling it cheaper, but if you buy the mid-level fuel—the equivalent of 95 octane fuel—you get 98 octane in your tank.

Senator NASH—I have three quick questions. During the election in 2001, the government came out with the target of 350 by 2010. It is now 2006. I am covering a bit of the same ground here, but why hasn't there been a greater take-up of biofuels—in particular, ethanol, because that is why you are here talking to us today?

Mr Milford—Simply because the economics of building an ethanol plant have not been there, and that relates to the excise pathway that is in front of a potential investor.

Senator NASH—Do you feel reasonably confident that in developing the ethanol industry around cane you are going to have, at the end of the day, a market to sell it to?

Mr Milford—I do not believe that the Australian public will maintain this opposition to ethanol once it becomes used more and more people have experience with it. Back in 1989 I ran around in a vehicle that had 10 per cent ethanol in it and I never noticed any difference. I am not Peter Brock—I am not going to vouch for the absolute level of performance—but I never noticed any difference. When I use it now I do not notice any difference. So, in terms of a market for this fuel and the public accepting it, I believe that that will happen once it becomes more

widely available. I think there is a need for education about the fuel and promotion of it to get us to that point.

Senator NASH—As you say, once it becomes more widely available. It is a bit a 'chicken and egg' situation: we need the oil companies to buy it and get it out there so that people can realise what a good product it is and that will in turn engender the development.

Mr Milford—It is of interest to me that in some of the ethanol trials operated by Queensland government in regional Queensland the percentage of E10 uptake—let us say it was 20 to 25 per cent—was about equal to the number of bowsers that were selling E10 at the service stations. In other words, if I drive into a servo and there is an E10 bowser empty I might give it a go; but I am certainly not going to wait. If somebody is there, I am going to go to another one.

Senator NASH—Exactly. You raised before the issue of the change in arrangements in 2011. Do you have a particularly view of how long they would need to be pushed out for? I am assuming that you want the same sort of arrangements pushed out.

Mr Milford—Yes.

Senator NASH—For how much longer?

Mr Milford—My feeling is—and I do not have plans for an ethanol plant or a business case for an ethanol plant in front of me—that five or 10 years would be an appropriate time period to push that out to.

Senator NASH—So you would want the starting point for those changes moved out to 2016?

Mr Milford—2016 or 2020, yes.

Senator NASH—Shell raised yesterday in their submission that they sell a lot of ethanol biofuels overseas. The phrase was 'where legislators favour ethanol'. That comes back to this mandating issue. Are you aware if there is a lack of compliance anywhere in America with those mandated requirements and what the penalties might be?

Mr Milford—I have never heard of a lack of compliance. It is not an issue that comes up in discussion of uptake.

Senator NASH—So the very fact that the government has legislated for it to happen means that the oil companies comply, realising that it is a legislative requirement?

Mr Milford—Yes. As I said, that requirement is not necessarily: 'Thou shalt use ethanol.' It is often: 'Thou shalt use X amounts of oxygenates,' or 'Thou shalt not use MTBE.' The imperative varies from jurisdiction from jurisdiction.

Senator STERLE—Do you know what a litre of ethanol costs to purchase in Brazil—roughly?

Mr Milford—I cannot answer that off the top of my head. I have probably got it on my laptop, so it is something I could answer relatively quickly.

Senator STERLE—Take it on notice, along with how it compares to other fuels.

Mr Milford—Okay. Once again, there are differences in Brazilian fuel pricing in terms of whether their value added tax is applied and how it is applied to biofuels and petrol. But, in general, ethanol has to price itself competitively with petrol, particularly the E85 blends. What we have seen in the last month or two has been some rearrangement of the market around petrol versus E85. That is a very large part of their market. As the price of ethanol got too high, people started using more petrol. But that petrol contains 21 per cent ethanol anyway. When they have plenty of ethanol, it will contain 25 per cent. There are a fair few feedback mechanisms in there.

Senator STERLE—If you could supply that information to the committee, that would be good.

CHAIR—We will have to draw it up there because we are running late again. Thank you very much, Mr Milford. If you could forward the bits of information that you indicated that you would take on notice to the secretary, that would be appreciated. Thank you.

[11.45 am]

THAMBIMUTHU, Dr Kelly, Chief Executive Officer, Centre for Low Emission Technology

REED, Dr Graham Philip, Program Manager, Centre for Low Emission Technology

Evidence from Dr Thambimuthu was taken via teleconference—

CHAIR—Welcome. These are public proceedings. The committee may agree to a request to hear evidence in camera or may determine that certain evidence should be held in camera. All evidence to the committee is protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence, and that may be held as contempt by the Senate. It is also contempt to give false or misleading evidence. If you object to answering a question, you should state the grounds on which you object to answering the question and the committee may decide that they want to insist on your answering the question. If they do so, you may request that the evidence be given in camera. I now invite you to make an opening address.

Dr Reed—Thank you. The Centre for Low Emission Technology is based near Brisbane. Dr Kelly Thambimuthu, who is our CEO, is appearing by teleconference. Some of you may not be familiar with the Centre for Low Emission Technology. It is an unincorporated joint venture of these partners: the Queensland government, CSIRO's Energy Technology Division and its Energy Transformed Flagship program, the Australian Coal Association Research program, other industrial partners including Stanwell Corporation Ltd and Tarong Energy, and the University of Queensland. Our mission is to progress the development of enabling technologies for the low-emission production of electricity and hydrogen from coal. A key part of this technology is gasification with carbon capture and storage. It turns out that this technology is also amenable for use to make liquid transport fuels from coal, and that is going to be the focus of my talk this morning.

A PowerPoint presentation was then given—

Dr Reed—I will give a short presentation on basically why you should be looking at liquid transport fuels from coal and how it is done. I will put forward a proposal for your consideration and then list some of the benefits that might accrue to Australia from proceeding with this.

First of all: why should you make liquid transport fuels from coal? Liquid fuels, for example, have the best energy density to amenity ratio; that is why they are currently preferred for transport purposes. They are easy to store, transport and distribute, and they are relatively clean and easy to use. In terms of chemistry, if you look at the number of atoms of hydrogen and the number of atoms of carbon in these different fuels you will see that the hydrogen to carbon ratio in natural gas is near 4:1; for coal it is below 1:1; oil falls somewhere in the middle at about 2.5: 1; and biomass, for example bagasse waste from sugarcane growing, has a ratio of somewhere around 2:1. This means that if you want to produce oil products from these different sources, in the case of natural gas you are starting with an advantage. That is a very good fuel for making a synthetic oil. In the case of coal or biomass you have to at some stage capture carbon. The technology that we are promoting has the capacity to capture carbon and therefore match the

carbon footprint—the amount of carbon that is emitted to the atmosphere—of conventional oil refining.

As I said, natural gas has high amenity value and it is particularly good for static uses because you have to have a certain infrastructure in place to distribute natural gas. Although it is quite cheap here in Australia at the moment, it does not take too much foresight to see that it is likely to go up in price. It is certainly more than twice the price it is in Australia in the United States, and it has gone a lot higher on occasions. So it is likely that the price of natural gas will be forced up in the future because it is an internationally traded material.

With regard to energy crops, the previous speaker spoke about bioethanol, which is certainly another option for liquid transport fuels. But here I am talking more in terms of crop residues that can also be converted by the gasification route into transport fuels. In any case, energy crops divert land and water resources from food into fuel production, which may be undesirable, and there is also the risk that crop disease could interfere with your fuel supply if you become too highly dependent on using biomass as your source of energy. On the other hand, Australian coal resources are, as I am sure you are all aware, very large, easily accessible, very secure and cheap to mine. The key to using those to make transport fuels is the gasification technology. It is the best way of combining coal resources with carbon capture.

How do you do it? This first diagram here shows you basically what you have to do. You mix coal with oxygen and steam, you react them in a gasifier at high temperature, you then process the gas in various ways which we are working on in the development work we are doing at the Centre for Low Emission Technology and then you take this gas mixture and you put it through what is known as a Fischer-Tropsch synthesis, where you react the gases to produce liquid products. An inevitable by-product of that process if you start with coal is that you also make carbon dioxide, so you have to do something about that and that means capturing the carbon dioxide and storing it in some form of geological storage.

This basic technology of coal to liquids has been used in South Africa by SASOL since the 1950s. It was originally developed in Germany but since the 1950s they have been using it in South Africa for strategic reasons because of the apartheid-era restrictions on oil imports. They built quite large plants there for turning coal into liquid products, and those plants are still operating today. At the oil price we see today of greater than $US40 a barrel, those plants are very economic.

Senator JOYCE—What is F-T?

Dr Reed—It is an acronym for Fischer-Tropsch, the catalytic reaction that makes liquids. The products that it makes are as clean in use as those from conventional oil or a natural gas to liquid technology, and they perform well. You can also turn natural gas into liquid products using a rather similar technology. The gasification technology that is used in South Africa has a number of drawbacks. It will not take the whole of the coal output from the mine—it needs coarse coal; it will not take the fine material. There are also a number of environmental obstacles to using that more widely. The residues are leachable, and so forth. All of these things would be obstacles to using the SASOL-Lurgi gasification technology more widely, and particularly here in Australia. Modern entrained flow gasifiers, which have been developed primarily for power

generation purposes, are much better suited to CO_2 capture and storage, and they do not have the same drawbacks in terms of coal acceptance and environmental emissions performance.

What we are proposing for our own purposes for the electricity market is to build a pilot plant facility to test Australian coals and the gas processing developments we are working on at the Centre for Low Emission Technology. The plant would be about five megawatts in scale and we would use modern, entrained flow, oxygen blown gasification technology. The part that we are proposing at the moment is shown here in this yellow box. It is the gasifier with parallel gas cleaning trains. One would be a conventional wet scrubbing system and the other would be a dry system because reducing water usage in this technology is a prime issue. We intend to submit this proposal to the federal government's National Collaborative Research Infrastructure Strategy scheme. We are currently out to tender for outline designs and costings, and we intend to submit that proposal. We estimate it will cost somewhere in the region of $A45 million to build the plant.

This plant will make a clean synthesis gas, but it can then be put through a gas shift and gas separation step. We would need this for the electricity market, and this is the part that we are focusing on in our current R&D program. This is the part that reacts the synthesis gas with steam and separates the gas mixture into hydrogen and CO_2. Another option would be to put part of that shifted synthesis gas and part of the hydrogen into a coal to liquids unit, which would use the Fischer-Tropsch synthesis reaction and can produce liquid products, from basically the same plant and just by the addition of this extra module. Another option that could be added to this plant would be to co-utilise biomass. Crop residues, wood waste and bagasse, for example, would be co-utilised with coal in this process and would improve the carbon footprint of this technology. Also, we would argue, that is one of the best ways of using these biomass materials because you are no longer susceptible to supply variations due to crop diseases, drought and so forth because you always have the back-up of running on coal alone.

So what benefits will this proposal have for Australia? It will tell us how Australian coals would perform in coal to liquids technology. It will tell us how Australian coals, in the hot, dry ambient conditions we have in Australia, affect the best technology for use in this process. It will improve coal to liquids gas processing and enable us to reduce costs. It will also produce trial batches of liquid fuels for validation in vehicle tests. It could provide support for a future coal to liquids demonstration plant—a larger scale plant—that could be built in Australia. And it will develop the skills and knowledge that Australia will need to become an informed buyer of the parts of this technology that will at some stage have to be imported. That concludes my presentation. I should say that I am a chemical engineer by background, rather than an energy economist, but I will do my best, in conjunction with Kelly Thambimuthu, to answer your questions.

Senator JOYCE—I have heard that there are two trillion barrels of shale oil in the United States, three trillion in China and 440 billion in Australia. Why would we be looking at this when we could be improving the technology to bring on shale oil?

Dr Reed—This is a relatively straightforward adaptation of technology that we want to pursue anyway for using coal to produce electricity. The process of turning shale oil into liquid fuels would also release a lot of carbon dioxide.

Senator MILNE—I have to ask a basic philosophical question. If we are looking at a carbon-constrained world and trying to rapidly get away from fossil fuels to renewable energy sources, why would we go down the coal track when we have the sun to produce solar thermal or we have geothermal to produce baseload electricity? We also have the capacity to produce alternative fuels from that electricity to take us into a hydrogen future. So we do not need this. In terms of carbon dioxide, isn't it true that this whole technology depends on carbon capture and storage and that, even if we did perfect carbon capture and storage, we are still going to have coming out the tailpipe greenhouse gases that are the relative equivalent of conventional oil? So we would not be much better off, if at all, than we currently are on CO_2 with greenhouse gas emission reduction targets.

Dr Reed—I think your primary reason for wanting to pursue this route would have to be that of energy security. I remind you that maybe 80 per cent of Australia's electricity comes from coal at the moment and that you have some of the cheapest electricity in the world. Surely you would not want to sacrifice those current advantages that you have. I think all of these other options that you have spoken about—solar power, windmills and nuclear energy—will all turn out to be more expensive. In terms of your energy sources, I would argue that you are actually far better off with a balanced portfolio of sources of energy so that you are never too dependent on any one source. For example, in the electricity market, windmills do not always produce electricity at the time when it is required. It is very important that you have a back-up source of electricity that can be ramped up and down to meet demand. When it is not easy to store electricity in any form, that requirement is normally met by coal.

Senator MILNE—I am aware of that but I am also aware that geothermal can provide baseload as can solar thermal. The argument about windmills' intermittency is an argument that the coal industry trots out all the time and, frankly, there are other solutions. But I will go back to the imperatives. I agree with you: if our sole consideration were energy security for Australia, then the coal option—this whole option—would clearly provide energy security. If it is about both energy security and a 60 per cent greenhouse gas reduction by 2015 by significantly reducing both electricity and transport fuels—and in this case we are talking about transport fuels—why would we go down this route when we have got natural gas, which is going to be a much cheaper option as a transitional fuel and has better performance outcomes in terms of transport?

Dr Reed—In the case of natural gas, yes, I agree. It is an excellent fuel from the point of view of a source for making liquid products but as I understand it, your largest reserves of natural gas in Australia are off your north-western coast. You can turn natural gas into liquid products but those plants would be likely to be located onshore, so you would have to get your gas onshore first in order to turn it into liquid fuels. As I said earlier, there are a lot of other markets in natural gas, within Australia and also for natural gas as an export commodity, which are likely to drive up the cost of natural gas in the relatively near term. I would not say that it is going to take decades for that to happen; it will happen within maybe the next five to 10 years.

Senator MILNE—Firstly, we have had a lot of evidence to this inquiry that Australia has a huge resource of natural gas. Secondly, in terms of where your stations might be, yes, the distribution network is an issue. But I would argue that carbon capture and storage is an issue because you have got to get it near the Otway Basin or whichever basin you are going to be capturing and storing the CO_2 in. It seems to me that there is absolutely no imperative to spend

this kind of money on coal. If Australia were not a huge resource of coal, we would not consider this in terms of energy security or greenhouse gas emissions compared with all the other options on the table, would we?

Dr Thambimuthu—One of the issues that we are facing is really the sheer flux of energy that we are using currently in various forms, as well as the availability of technology in relation to existing infrastructure that has to be transformed into a new energy economy in the longer term. We will seriously disadvantage Australia if we go down the path where we are going to do it alone in terms of developing technologies and buck the trends that exist today in the world. It is to do with economic competitiveness.

I would argue, for example, that renewables and other forms of energy are the longer term alternatives, but they have some way to go in terms of technology development and economic cost in terms of providing the energy to fuel the economy. Currently we have situations where we can adapt the existing fossil fuel infrastructure and we can make it have practically low or no carbon emissions in providing some of the energy forms that we need in the interim. It is the bridge or transition process at low cost that we are concerned about. Certainly, we can do this with traditional fuels.

Senator MILNE—What I am arguing is that natural gas has a lower cost than what you are proposing here. This is not proven technology. You say that the renewables have a way to go. In fact, geothermal is likely to be an energy source for the new Roxby Downs expansion in South Australia. So that is going to be up and running long before carbon capture and storage is proven anywhere in the world, in fact.

Dr Thambimuthu—I can comment on that. I do happen to the chairman of the IEA greenhouse gas R&D program. I would argue that carbon capture and storage is on the path of being proven. In fact, it has been practised in many different ways over about 20 years in relation to enhanced oil recovery. Currently, there are three major projects in the world that are actually capturing and storing in the order of three million tonnes per year of CO_2 underground. It is well on the path of being proven.

In relation to the situation with gas that you mentioned, certainly Australia has a lot of gas, but I would argue that a lot of the vast deposits of gas that we have is currently earmarked as LNG exports. Once LNG becomes a tradable international commodity in the world in a big way—and by all estimates the International Energy Agency is estimating that the gas rate is going to grow phenomenally through countries like China, India and the United States, for example, picking up the demand—it will command international prices. We would be left behind in a sense in terms of our own domestic users relying upon traditional sources of gas, on a land based source. How long are we going to be immune from international gas prices? I do not know. But I think it will be a short period of time before we start competing at international levels.

Senator MILNE—That may be the case, but natural gas now is decoupled from the oil price, which gives it a big advantage at least in the short to medium term. Just returning to your contention that this technology will somehow be cheaper than natural gas, I would suggest to you that it is going to be a very long time before that is the case. How much federal government funding are you currently relying on to even get this technology off the ground?

Dr Thambimuthu—Our main purpose in trying to get this technology going is basically to provide a platform to evaluate the Australian coal resource base in relation to its application to this technology. We are beginning to see a trend in the United States where, increasingly, interest is focusing on coal as a source of liquid fuels due to energy security concerns. We will certainly start to see it in many other countries, like India and China. Our argument is that Australian coals are premium coals. They are traded on the world market. They are often used as blending feedstock to improve the quality of indigenous coals. By proposing to develop this facility, we are basically trying to enhance the economic potential of coal as well as evaluating its capabilities in terms of fuelling the need that we see coming along.

Senator MILNE—I understand that it is about enhancing the economic potential of coal, but I asked you: how much federal government money is involved in your current research and how much you are asking for to keep this project going?

Dr Thambimuthu—In our current research we are focusing mainly on enhancing coal gasification technologies for electricity production. For our current program we get about $9 million in support from the federal government as well as $9 million from the Queensland government and roughly about another $8 million from other parties. The proposal that we have on the table is basically to extend the research and to do more in terms of both electricity production as well as the other coal to liquids technologies. We are at the proposal development stage and we will be requesting in the order of another $30 million to $35 million for a facility from the federal government through the NCRIS program and the balance from industry and other parties.

Senator MILNE—To finish that off, even if you got this up and produced it as a transport fuel, its CO_2 omissions are going to be equivalent to conventional oil?

Dr Thambimuthu—Yes, that is true, if you use the coal—

Senator MILNE—So it does not help our task to reduce our greenhouse gases from transport to go this route?

Dr Thambimuthu—That is why we are proposing things like coprocessing with biomass and crop residues.

Senator MILNE—I understand all that. I was just establishing the fact that on the transport side, as an alternative fuel, it does not help our position in terms of greenhouse gases; it may do in terms of secure supply. Equally, in terms of electricity, if geothermal or solar thermal can produce baseload power then you get the argument about cost if you can prove up carbon capture and storage?

Dr Thambimuthu—Yes. I would say that carbon capture and storage for electricity and pure hydrogen production as an energy vector will practically have low to zero carbon emissions with geosequestration. It will be on par with the other technologies.

Senator MILNE—Thank you.

Senator O'BRIEN—I was going to pursue that. The environmental advantage of this project is for the use of coal via this process for electricity generation—

Dr Thambimuthu—Primarily, yes.

Senator O'BRIEN—as distinct from the coal-burning method, which does not give us an easy way of carbon capture. Is that fair comment?

Dr Thambimuthu—Yes, it is fair comment. We can use the existing coal-burning methods to capture carbon, but we probably will not be doing it as efficiently as we would with these new gasification technologies.

Senator O'BRIEN—What do you envisage this process would add to the cost of electricity, if anything? If this was the process that we decided to embark upon as best practice for electricity generated from coal energy, what sort of cost would we be adding to the unit price of electricity?

Dr Thambimuthu—I can comment on that, but let me preface my direct response to your question. Currently we have various aspects of this gasification technology for coal in practice mainly in the chemical industry. By the same token we also have CO_2 capture technologies in practice in the petrochemical sector. But we do not have these coming together in power production technologies. We could, if you like, draw upon these existing technologies and put them together and make a power plant with CO_2 capture and storage with practically no greenhouse emissions. But because we are doing this by piecing two different technologies together for the first time, it will not be as energy efficient or as cheap as we would like it to be. If we did it based on what we have today—we have worked out numbers in terms of the cost of electricity—it would cost roughly 50 per cent more than producing electricity without CO_2 capture and storage. And the goal of our research program is to engineer the systems in a better way so that we can reduce the cost over the longer term and make it more efficient.

Senator O'BRIEN—So something lower than a 50 per cent cost premium but significantly higher than current electricity prices—

Dr Thambimuthu—Yes. Current electricity prices would increase by 50 per cent if we applied this technology.

Senator MILNE—How do you respond to the CRC for Coal in Sustainable Development, which says that by 2013 solar thermal will be cost equivalent to current electricity generation from coal? Given that, if solar thermal can do it at the same price as coal can do it now, why would we not go that route instead of this route?

Dr Thambimuthu—The route that we are proposing will also go down in cost. In fact, I recently participated in the Intergovernmental Panel on Climate Change assessment report on CO_2 capture and storage, and we estimated that the cost of the technologies that would apply to coal would also go down over the long term. We estimated that it will go down in the next decade by about 30 to 40 per cent, based on our understanding. So we have to realise that these costs are not going to remain static while the costs of other technologies go down; they will go down at the same time.

Senator MILNE—I understand that, but one of the CRCs has said that, within seven years from today, it is cost effective with coal as it currently stands. To me, what all this points to is that it is a lifeline for the coal industry. It is not actually about energy security or greenhouse gas reduction; it is about finding a way for business as usual for coal, which plays into both of those, and neither of them are as cost efficient as alternatives.

Dr Thambimuthu—I think I would argue and say that the world cannot be weaned from fossil fuels over the next five to seven decades. If we look at the sheer flux of energy use in the world and how we can supply that and maintain economic and social development, we would rapidly come to the answer that we have to live with fossil fuels. This is making fossil fuels more environmentally acceptable. We cannot walk away from that option.

Senator MILNE—Yes, but we could walk away from it in Australia—that is clear. The only advantage of this technology in the longer term, if you prove it up and it works, is that you could sell the technology to China, India and other places with large coal reserves that do not have the same advantages as we have on more cost-effective and better alternatives. Is this simply about proving up a technology that we could sell overseas? There is nothing wrong with that. But in my view it just does not stack up as a transport fuel or an energy source for Australia on the grounds of either energy security or greenhouse gas reduction in the medium and long term.

Dr Thambimuthu—I would argue that we need a balanced portfolio of all options in order to drive our economic development in the longer term. We do not have the luxury of denying any option. This certainly is part and parcel of it.

CHAIR—How does your project relate to the Monash project? We heard yesterday from Monash Energy about the project in Victoria. How are you working with them, because they are talking about a pilot plant as well?

Dr Thambimuthu—The Monash project is focused mainly on coal to liquids from brown coal. You would appreciate there are some differences between black and brown coals. While the gasification technology might be similar, they are not identical fuel feedstocks, and the process efficiencies you can achieve with black coal, for example, are far higher than you would be able to achieve with brown coals.

CHAIR—They are also involved in, I think, the CRC trial that is going on in the Otway Basin. Are you involved with that?

Dr Thambimuthu—I am aware of that. You are talking about the geosequestration pilot?

CHAIR—Yes.

Dr Thambimuthu—I am very much aware of that.

CHAIR—But your organisation is not specifically involved with that trial?

Dr Thambimuthu—No. We are more concerned about the upstream end of where you do the capture, in the process technology. The Otway project is more focusing on what happens when you inject the fuel to underground, monitoring it and learning about that process.

CHAIR—As there are no more questions, thank you very much. I realise that it is probably late over where you are at the moment, so thank you for giving us your time.

Dr Thambimuthu—My pleasure.

Proceedings suspended from 12.21 pm to 1.16 pm

TAIT, Mr Lachlan William, Graduate Policy Analyst, Hydro Tasmania

TITCHEN, Mr John Philip, Manager, Technology and Commercialisation, Hydro Tasmania

CHAIR—Welcome. I remind you that these are public proceedings. You may request that some evidence be heard in camera and we may determine that some evidence should be heard in camera. People giving evidence to the committee are protected by parliamentary privilege and it is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to the committee. Such action may be considered by the Senate as contempt. It is also contempt to give false or misleading evidence to a committee. If you object to answering a question, you give your grounds for objecting to answering a question. The committee may insist that you answer a question and, if we do insist, you are entitled to ask that that evidence be given in camera. I invite you to make an opening address and then we will ask you some questions.

A PowerPoint presentation was then given—

Mr Titchen—We do have a brief presentation that we would be pleased to share with you before moving on. As a brief introduction to Hydro Tasmania, I know that a number of you are aware of the business and I will be very brief. Hydra Tasmania is Australia's largest renewable energy generator and our vision is to be Tasmania's world-renowned renewable energy business. We do have a developing interest in sustainable transport and we see that there is an important opportunity to address energy security and climate change issues in this sector. The context for this we see not so much from our own work in the world supply and demand arena but in reading the literature of analysis of this.

Global demand we know is very much burgeoning. Within Australia the gap between production and demand is opening up, and we have a representation of that in this slide. The key issue that we are considering is the peak oil issue, where forecasts range from oil production having peaked to it moving out to between 2012 and 2030. There is a range of views but really the issue concerns the peaking production in individual locations and the concept of that happening at an international level.

Linking the energy supply issue of peaking oil with climate change, from what we have seen there is a global consensus that human induced climate change is a reality. In this context, transport is a significant sector in emitting 14 per cent of CO_2. Stationary energy and agriculture are also significant sources. These figures come from the national greenhouse gas inventory. On the linking of sectors, we see that addressing alternative fuels in the transport sector develops some interesting linkages between agriculture and transport and between stationary energy and transport. It makes looking forward at the overall energy picture a bit more complicated, and we feel that these sectors really need to be considered in conjunction rather than in isolation. Clearly, agriculture has some potential to contribute to emissions reductions in the transport sector, particularly through biofuel feedstocks. In the transport sector, there is a developing potential for hybrid vehicles to be plugged into the grid, which then draws us into the stationary energy sector and, in the longer run, there is the potential for hydrogen to be produced using what would traditionally be stationary energy sources. When we bring these two things

together—substantial oil price increases and the challenge of reducing greenhouse gas emissions—the transport sector is brought into this debate. The higher oil prices get, the more potential there seems to be to address CO_2 emissions through this sector.

On Hydro Tasmania's interaction with alternatives transport fuels going forward, we feel that there is a good linkage between some of the responsibilities we have with remote area power supplies and the use of diesel in those power supplies and the potential for biodiesel as a fuel. We have some activity at the moment on King and Flinders Islands, where we are running diesel power systems. We have been reducing the amount of diesel through the introduction of wind, and there is the potential, either directly or through the production of biodiesel, to offset exposure to the diesel market.

As to hybrid technologies, at this point we have a few hybrid vehicles in our fleet, but, interestingly, the plug-in of hybrid vehicles in the future does have some direct ramifications for electricity supply. Even plugging an electric vehicle into the grid, if it is a coal grid, does not impact negatively on emissions—so there is an emissions neutrality there. As the technology develops, as long as emissions do not get worse in the stationary electricity sector, there seems to be some potential for that technology.

Hydrogen is an area that we have been investigating for use in the longer term. Renewable energy, as the energy source providing hydrogen fuel, does appear to the only currently available approach to producing zero emission hydrogen. We prepared a low-emission technology development fund, or LETDF, application earlier this year, but we did not submit that. When we came to conclude that submission, we found that the project costs exceeded levels that we could sustain given the LETDF funding formula. In our submission to the inquiry I think we said that we were putting in that application, but as the costs emerged we were not in a position to follow through with that.

Our proposed approach in this sector—and I am not trying to represent that we are a transport business, but to give our input to this debate—is that Australia needs to develop a range of options to meet transport fuel supply and climate change imperatives and we feel that this is the case in the transport sector and also in the stationary energy sector. Having a narrow approach appears to us to be high risk. We have seen the unexpected development of the price of oil over recent times and that is just an example of the uncertainty that we live with.

We believe that there are some alternative transport fuels that represent fairly short-term commercial opportunity but that we also, as a nation, should consider developing other options that might not be commercial now but which have the potential under some future scenarios to provide a contribution. Immediately, we see great merit in providing strong support to the development of the biofuels industry. In the medium term, we see strong merit in promoting hybrids and plug-in hybrids, and in demonstrating hydrogen transport so that it is available as a future option. But that would need more direct government support and, we have found, more significant than the one-third funding under LETDF.

Hydro Tasmania would prefer the favourable settings on biofuels and other alternative fuels to be sustained. We also feel that the excise arrangements that exist now for fuels such as hydrogen are actually disadvantageous. If you look at the cost of the excise for the energy value of the

fuel, it is actually worse than that for a petroleum-based fuel. So there needs to be some consideration of that in our view.

In conclusion, we believe that there should be a range of options developed and that transport fuel supply security and climate change imperatives should be considered in conjunction. There are alternative transport fuels that have cost-effective potential in the shorter term and, as I stated earlier, ongoing support for the biofuels sector, promotion of hybrids and demonstration of hydrogen transport are areas where, we would suggest, there could be government action. I would be happy to field any questions on our submission or on what we have presented today.

Senator HEFFERNAN—You actually skipped the second last bit. You skipped 'hydrogen excise needs to be reduced', didn't you?

Mr Titchen—No, my comment on that was that the hydrogen excise appears, from our calculations, to exceed the equivalent excise for a petroleum fuel, when you look at a dollars per energy content calculation. It is measured in excise per volume of gas; with liquids, it is calculated on litres of liquid under particular conditions. The calculation works out that it is actually a greater penalty.

Senator O'BRIEN—You had a view that you could get a project under LETDF up and running, then you did your costing and found that it was not affordable. Could you explain that a bit further?

Mr Titchen—We found that we were on a fairly compressed time frame with the LETDF project, and we had a fairly intense development of that. Through negotiations with suppliers of equipment, we believed that we were on a favourable footing to just squeeze in with the LETDF formula. This was a new area of activity for Hydro Tasmania and the commercial proposition was, at best, marginal or slightly negative. With costs increasing beyond what we had expected, and in terms of the final offers that we were getting from equipment suppliers—electrolysers and vehicles, in particular—we found that it was just beyond what we could expect our board to commit to.

The other factor with LETDF is that it requires a certain scale. The minimum funding was $20 million, so therefore a $60 million project was a minimum-sized project. That is quite a sizeable project in this arena and it may well be that a smaller-scale initial project would have much of the merit of the larger project—maybe as an initial step.

Senator O'BRIEN—What scale would be viable for the Hydro?

Mr Titchen—It is more the funding equation. We are finding that, with renewable projects in remote areas, for example, there is 50 per cent funding. Something like that would be much more suitable to us than the one-third funding under LETDF.

Senator O'BRIEN—So the $60 million project would be doable if you got 50 per cent of it funded? Is that what you are saying?

Mr Titchen—I think our preference would be to do something on a slightly smaller scale so that the risk that we are exposed to is of a more moderate dimension. But we do believe that we could demonstrate many of the same effects with a smaller-scale project.

Senator O'BRIEN—And that would involve setting up refuelling stations?

Mr Titchen—Yes.

Senator O'BRIEN—And your business running hydrogen fuelled vehicles? Is that how it would work?

Mr Titchen—The proposal in the LETDF project was for a number of buses and hybrid hydrogen cars—like a Toyota Prius but running on hydrogen. The reason for that is that the hybrid vehicles use less fuel and so the cost of the hydrogen becomes a less significant factor. You can put a reasonably small investment in buses for the amount of use that they get and so you can justify a reasonably sized fuelling station and spread the cost of the infrastructure fairly quickly. The bus hybrid, the car hybrid plus the electrolyser based fuelling stations was the focus. Whilst we have not put in the application, we still do have an interest in putting together a project that has a greater merit from our commercial point of view.

Senator O'BRIEN—What would it would cost in household electricity to run a vehicle like the plug-in hybrid vehicles that you refer to?

Mr Titchen—We have done some analysis of the long-run potential for the plug-ins, and it is really the up-front cost that is the issue. Running them on electricity is actually quite cost effective. I would be happy to come back with some numbers on the cost of running them.

Senator O'BRIEN—That would be very useful.

Mr Titchen—There are some parameters there. If you go for a long trip, you would be using more of the normal fuel in the car; but it is conceivable that you could do 30 kilometres without the engine running. If you did a 30 kilometre round trip in a day then you would just be running on electricity. We would be happy to provide some examples of that, if that would be helpful.

Senator O'BRIEN—What is the up-front cost of the vehicles available now? I know that vehicles are available in Europe.

Mr Titchen—The example vehicle that is being tested—and we have not got a commercial price for that at this point—is the DaimlerChrysler Sprinter van. A small fleet of those are being tested. It is at a premium to the cost of a normal hybrid. I could not quote you an exact number. The main issue is scaling-up the battery somewhat. Just in the last week Toyota has announced that they are undertaking research into the plug-in hybrid. There are some conversion kits in the US where for $US12,000 you can convert a Toyota Prius to a plug-in version. So it is an after-market equivalent, but maybe that represents the top of the cost that you could expect for that sort of vehicle.

Senator NASH—In the excise area, you said that excise rebates are helpful and should be sustained until the biofuels industry is well established. Do you think 2011 is too soon for the current arrangement of changes to come in?

Mr Titchen—There is a risk that it is too soon. Rather than having a definite cut-off there, I think there should be consideration of sustaining it, depending on the state of the industry at that point.

Senator NASH—Do you think it is something that we should review, say, 12 months out before then? As you say, should we leave it until then, assess it at that point and then, if needs be, push it out?

Mr Titchen—Ideally, from a biofuels perspective—and we are not yet in that game; we have not made a step into that area but we are looking at it—that encouragement would be helpful. I suppose, ideally, a biofuels producer would be looking for an extension. I think the principle should really be to try to sustain that industry. If dropping it off were unfavourable for the industry, if it retracted the industry and the review helps that then that would be a useful thing.

Senator NASH—The PowerPoint frame on alternative transport fuels said:

- To succeed, Australia needs to:
    - Provide strong support for the development of a biofuels industry;

Would you like to list a few things that you see as coming under that banner of strong support?

Senator HEFFERNAN—Before you do that, should you declare your interest in what you intend to do with bio in the future?

Mr Titchen—Yes, I would be pleased to cover both those things. As I said in this presentation, our focus has really been in the biodiesel arena. The reason for that is the connection to the remote area power supplies. We have to look at the synergy between what we are already doing and what we would like to do in future. We are not looking to take large steps away from the nature of our business at the moment, so a diesel relationship is a more likely step for us. I do not have a basis for our being involved in an ethanol activity, so it is really the biodiesel arena that we have been looking at. That is our interest. We do see that the excise arrangements are helpful in justifying an investment in that arena. As I said, we have not decided to make an investment in that area at this point, but sustaining an excise rebate would help our business case.

Senator NASH—One of the earlier witnesses referred to biofuels as an 'infant' industry. I assume when you are talking about assistance you mean in terms of getting the industry up and running but with a view to it being sustainable on its own at a point in time?

Mr Titchen—Yes. The other factor that we would like to emphasise is that we see merit in Australia having options into the future to expand a particular sector if circumstances require that. There is some limitation on the resources, for example, in the biodiesel arena. It is not an endless supply potential. There is the potential to extend through increasing certain crops, but I

am sure there are trade-offs between those crops and other crops that benefit the nation. We are proposing that a number of options should be available for the nation rather than just depending on one pathway. So we would encourage these alternatives to be developed, sustained and grown where they have strong commercial merit.

Senator MILNE—I am really interested in this initiative and what is going on at the university as well. I presume you are working with them in this whole hydrogen area. What puzzles me is why you would go the hydrogen route when you can produce your energy renewably to the grid and then plug into the grid with a 100 per cent electric car?

Mr Titchen—Our research has suggested that a combination of the plug-in and the fuel is the likely medium- to longer-term solution. So initially it is conceivable that we have petrol hybrid plug-in and we are very interested in how that pans out. The main connection is probably through electricity retailers. We are a generation company, so the connection is less immediately clear for us on that. We see hydrogen in combination with a plug-in vehicle as being the interest, and the viability of that really depends on the oil price climate going forward and the significance of any carbon constraint on the sector. We cannot quite see a 100 per cent electric vehicle on the cards at the moment. If that emerges then that may well be a strong competitor to the likes of hydrogen.

Senator MILNE—There is a 100 per cent electric car on the road right now in India and 300 of them are driving around London. There is one trying to get into the Australian market, but it is being blocked. I have driven it myself. It is a 100 per cent electric vehicle. You just plug it into a power point and go. The problem is, of course, that, when you plug it into a power point, you are plugging it into coal-fired power. That is why I come back to you saying that there is already this technology. Admittedly, it is not equivalent in performance to passenger vehicles and so on. But nevertheless it is there. Hydrogen seems to me to be a really expensive circuitous route. If you can get 100 per cent renewable energy generation and then get plug-ins, hydrogen is a very expensive diversion, is it not?

Mr Titchen—We have been looking at the long run comparison of these different technologies. There does seem to be an issue with vehicle range.

Senator MILNE—Absolutely—there is.

Mr Titchen—If you have a short range then it is conceivable that you could have a plug-in and not use the fuel that supplements the hybrid.

Senator HEFFERNAN—Describe short range.

Senator MILNE—Eighty to 100 kilometres maximum at the moment.

Mr Titchen—The difficulty is that the battery technologies are improving all of the time, so I think that range is going to gradually climb. At the moment something like a 30 kilometre plug-in hybrid I think is quite conceivable in the short term. That would then increase as battery technologies improve and they become cheaper and lighter.

Senator MILNE—This little one that I drove has an 80 to 100 kilometre range.

Mr Titchen—Yes. Personally, I think I could live with a vehicle that ran 80 to 100 kilometres for many of the trips that I do. There are other vehicles that require more than that. That is where the fuel comes in. When you look at the cost of hydrogen in a plug-in hybrid, it becomes much less significant as a cost of use of the vehicle. So, by having a more efficient, plug-in vehicle, there does seem to be the potential for a fuel such as hydrogen to be competitive.

Senator MILNE—So going down that route, how do you envisage that we would produce the hydrogen to be able to do all of this? That in itself is energy intensive, unless you have a renewable source—we come back to this all of the time—in terms of the initial energy needed to generate the hydrogen. I am aware of some of solar technologies. The proposition for Tasmania, of course, is because it is hydro. But that is not going to be the case for the rest of the country.

Senator O'BRIEN—Or wind.

Senator MILNE—Yes.

Mr Titchen—Certainly, the basis of our proposition is the wind hydro supply. The reason we were proposing Tasmania as an excellent location for that is because, as well as the availability of the renewable energy, the transport logistics are fairly compact. We do not have the huge volumes and also the complex networks of roads. It is very much more radial. That was the focus of ours. But there is a wider issue of stationary energy emissions into the future. There are a number of potential solutions to lower emissions electricity. Our business is about renewable energy, but we do not take the view that therefore other solutions are invalid. There may be other solutions to low emissions. As long as they have community and environmental acceptability, we would see that, if the life cycle of the fuel is low in emissions, it has merit. Some of those technologies are still in development. We hear about higher efficiency coal and sequestration. Some of those are yet to be fully proven. I suppose the test is what the emissions merits of different alternatives are. At the moment we see that the renewables route is a way to demonstrate this option now. It is hard to demonstrate it using other technologies at the moment.

Senator MILNE—As to the hydrogen ICE vehicles, what does that mean and what do they look like? Are they available in Australia? Do we have to import the 700 that you want to use in this trial? What is the status of them?

Mr Titchen—The internal combustion engine—the ICE—is just the standard engine that we have in our car. Some vehicle engines have been converted to hydrogen. For example, Ford has a program in Detroit where they have converted a range of engines, from a 6.8 litre bus engine down to a 2.3 litre engine for a Ford Focus. They have replaced injectors and set up fuelling systems and detectors for hydrogen. They have a number of prototype vehicles. They have just released a small transit bus on the hydrogen internal combustion engine platform. So it is a competitor to fuel cell in a way but at a much more modest cost.

Senator MILNE—So we would have to import these 600 or 700 at this point to get the trial up and running? That is obviously part of the big cost of the project.

Mr Titchen—The proposition was an international linkage, yes, and the equipment is generally available overseas. There would be the potential, if local manufacturers were

encouraged to participate, for a local industry to be established. The technical barrier to take up this sort of technology in Australia is not enormous.

Senator MILNE—But, to make this happen, what is your bottom line of federal funding?

Mr Titchen—I am in a difficult position in that I am not the board of Hydro Tasmania, so I cannot make a commitment in terms of a business case.

Senator MILNE—Give me the point at which it is not viable.

Mr Titchen—At the LETDF level it was certainly not viable, and that was one-third funding. At more like 50 per cent funding, I think we would have a better shot at making it work, but I am not in a position to commit our organisation to a project on funding.

Senator MILNE—I understand that. I am just trying to understand how much you are asking for vis-a-vis carbon storage and everything else.

Mr Titchen—In the order of 50 per cent.

Senator HEFFERNAN—I would like to get a bit of history from Hydro Tasmania. Can you provide to the committee the history of what you pay as a dividend to the government? You do not have to provide it today. I am asking this in the context of you saying you want to go into the biofuels industry—to grow the business, I take it. Is that why you want to do that?

Mr Titchen—Our interest in biofuels would be as a commercial proposition, yes.

Senator HEFFERNAN—Given that you have a similar status to the hydro arrangement on the mainland—which pays a fairly generous dividend to the various governments; in fact, $200 million was going to be taken out as a dividend before it was going to be privatised—could you give us the history of the dividends you have paid to the Tasmanian government? You have also, as I understand it, made application for some input from the government. You can give us the fine detail in due course, on notice, but roughly what do you pay per year to the government down there as a dividend?

Mr Titchen—I would rather come back to you with precision. The dividend payment is not within the scope of my role.

Senator HEFFERNAN—I do not want you to get sacked! Could you take that on notice and give us the history of the dividends you have paid to the Tasmanian government?

Mr Titchen—Yes, we would be happy to provide those factual matters.

Senator STERLE—Following on from Senator Milne's question, how far are we from having a hydrogen fuelled internal combustion engine?

Mr Titchen—Our view is that the technology exists for hydrogen fuelled internal combustion vehicles. There have been trials on this for many years. Work was done in the seventies, when the oil price spiked. The University of Tasmania, which Senator Milne referred to, have

themselves converted vehicles to hydrogen. So it is quite a practical proposition. BMW and Ford have the technology. Volvo recently announced a natural gas hydrogen vehicle prototype. I think the main issue is the deployment of this technology—fuel availability. There is a lot of discussion of the chicken and egg problem in the hydrogen sector—infrastructure is required to fuel vehicles and vehicles must be available to use the infrastructure. Technology is available on both sides but, to demonstrate this, they need to be brought together.

There is a trial in Perth at the moment as part of an international fuel cell bus program. That is an example where a fairly small development has occurred using existing feedstock and internationally provided technology. But the fuel cell technology is fairly high in cost and we see that there is a potential for transition to hydrogen through the internal combustion engine. We have had engagement with Ford in Detroit in terms of the availability of technology. There is some up-front establishment cost in terms of testing vehicles. A major manufacturer going to market with a vehicle requires some millions of dollars of crash testing and compliance testing and they need to make sure that when they take the product onto the roads they can support it and that they do not have reliability issues. As a big organisation they are very sensitive to any detrimental reputation or impacts of a new technology coming out. So government support in terms of getting a fleet on road is really a key to making the step forward.

CHAIR—I notice in the initial part of your submission you talk about wind farms. Can you give us your views on the positives and negatives of wind farms?

Mr Titchen—I should declare my interests here in that I moved to Tasmania to work on wind farms, so I am a fairly strong supporter of wind power. In Tasmania we have a number of wonderful natural resources including wind and hydro resources. Our approach has been to find locations where the resource is excellent, the transmission access is good and the environmental factors are acceptable. Through selecting appropriate sites we have found that there has been good community support for that. Some of the factors such as intermittency of wind are potentially overstated in the national scene. We have a fairly modest penetration of wind power in Australia and when you get to high levels of penetration these issues become more significant. But at the moment there is great potential in Australia for wind development. We have an excellent wind resource and the technology has developed in a very favourable manner over the last decade or more. Does that cover the sorts of factors that you—

Senator NASH—Very interesting, thank you.

Senator O'BRIEN—What about the cost per unit of production? How is that travelling vis-a-vis coal fired production, for example?

Mr Titchen—The progression of costs of wind power has been quite dramatic really over a longer period. Fortunately, in the last year or so there has been a bit of a hiccup and that is because in the US they have an incentive, the production tax credit, for wind power, which is a short incentive. That has drawn a lot of production towards the US but there has not been the opportunity to justify the development of new manufacturing facilities and so there is currently a shortage of wind equipment locally and there is such a high demand for it. But in the long run there is continual scale-up of the technology and continued reductions in cost. The cost curve is well published. From memory I think that it is the order of four per cent per annum—and I would have to validate that—reduction in the technology cost over a sustained period. There is a

hiccup of the moment. Woolnorth wind farm, our first large development in Tasmania, could have been developed in the early 90s with 100-kilowatt wind turbines. There are now three-megawatt wind turbines—that is 30 times bigger—going in at that site this year. So that is an example of the rapid progression of that technology.

Senator O'BRIEN—For the same wind resource?

Mr Titchen—Yes. There will be approximately 13 or 14 times the installed capacity of the site due to the improvement in the technology. It has been particularly surprising how that technology has developed.

Senator O'BRIEN—So there is continuing improvement in the technology?

Mr Titchen—Yes.

Senator O'BRIEN—I go back to my original question, which was about the cost of power. People say, 'This is all well and good, but it is not economically viable.'

Mr Titchen—When you look at the cost of wind power, it is a valid comparison to look at the emissions of wind power as well. If you compare the cost of wind power with the cost of low emission alternative technologies, it comes out pretty favourably.

Senator HEFFERNAN—How much spare power do you have in your grid?

Mr Titchen—The Tasmanian grid is now connected to Victoria, and—

Senator HEFFERNAN—Could I come to that very slowly. One of the curiosities for this committee has been the apparent, shall I say, root-out that the fuel companies have given the ethanol industry, obviously trying to protect their patch. You have signed up to $92 million annually for rent on Basslink, which is going to be a deep drain on your pocket.

Mr Titchen—I would have to refer to others to give you a quote.

Senator HEFFERNAN—It goes to National Grid International. That could endanger your viability, given your long-term commitment to Basslink. Do you think there is some potential, with all the good work that Hydro Tassie has done, that it could all come undone by trying to hook into the mainland and the mainland giving you what the fuel companies have given the ethanol industry—in other words, a root-out?

Mr Titchen—Certainly the Hydro Tasmania view on Basslink is that it is a very positive development. There has been careful consideration of that project—from a commercial aspect and very substantial environmental studies—and we do not have the view that it has a detrimental impact on the business. We decided—

Senator HEFFERNAN—In other words, you are not trying to regulate the cable; you are happy to have an unregulated—

Mr Titchen—That is an area that I would not really be able to add anything to. My focus is really the technology development and commercialisation zone. I am not in the regulation of electricity industry zone.

Senator HEFFERNAN—With regard to you expanding your business for bio and if there were to be some government assistance in that to help you grow the business, I think it would be fair for this committee to give consideration to that part of the growing of the business not actually being subsidised for what could, in the long run, turn out to be a pretty disastrous 25-year sign-up to this cable, at a fixed rental, regardless of your profitability.

Mr Titchen—The approach that we take to business decisions is that individual decisions are put to our management and board on their own basis. It is not at all a matter of a biodiesel consideration being necessarily linked to a Basslink or wind activity. In some cases, there is an interlinkage, but I cannot quite see the linkage with biodiesel.

Senator HEFFERNAN—Would it be inappropriate for you blokes to provide, through your head office—without getting the sack, that is—the details of the National Grid International Basslink agreement?

Mr Titchen—I am not in a position to be able to say whether or not we can do that.

Senator HEFFERNAN—If you go back to them, they might tell you to tell me to go to hell, and I do not mind if that is the case.

Mr Titchen—I know that there is commercial coverage of certain aspects. We can certainly come back to you and to tell you what we can provide.

Senator HEFFERNAN—I would be interested to see that the mainland were not trying to make life difficult for you fellows.

Senator O'BRIEN—They would have to be careful—they might want power sometime, like summer in Victoria!

Senator HEFFERNAN—There is a bit of a scope for ducks and drakes in all of this.

Senator O'BRIEN—It is a two-way process, but markets are markets. That is right.

CHAIR—That is the end of the questions. Thank you very much. If you could forward to the secretariat the information that you have said that you will take on notice, that would be much appreciated.

Mr Titchen—Thank you very much for the opportunity to present, make a submission and answer your questions.

[2.05 pm]

WADIWEL, Mr Dinesh Joseph, Senior Policy Officer, Council of Social Service of New South Wales

CHAIR—Welcome. I inform you that these proceedings are public proceedings, although the committee may agree to hear evidence in camera or it may determine that certain evidence should be heard in camera. You are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to the committee. Such action may be taken as a contempt of the Senate. It is also a contempt to give false or misleading evidence to a committee. If a witness objects to answering a question, the committee may decide that the witness should answer. If so, the witness may ask the committee to hear the evidence in camera. I invite you to make an opening statement, after which we will ask some questions.

Mr Wadiwel—The Council of Social Service of New South Wales, NCOSS, is the peak body for non-government human services in New South Wales. You are probably familiar with the work of our federal counterpart, ACOSS. We seek to speak on behalf of low-income and disadvantaged households in New South Wales and represent the concerns that we pick up through our work with NGOs in New South Wales. Our submission to this inquiry is purely focused on social impacts and the potential that we see to reduce some of those impacts through federal government initiative. We have not made any comment about alternative fuels and technology—that is beyond our capabilities. We are concerned about some of the impacts of rising fuel costs, particularly on low income households and on the capacity to provide services through non-government community organisations in New South Wales. We believe some of these concerns are held in other states of Australia.

As I stated, we have a significant concern around the social impact on low-income households. From the evidence that we have seen, some households that rely on motor vehicles spend up to 30 per cent of their weekly income maintaining that vehicle through maintenance and fuel costs. Obviously, the rising fuel costs will have an impact on the capacity of those households to continue to use the car. From our perspective, some of these households are in a really tough position because they rely on that car to get to work and access services, which is why they keep using the motor vehicle. Often these households are in areas where there is not high-frequency public transport—for example, in outer metropolitan or rural and regional areas. From the evidence we have seen, a number of households in metropolitan Sydney are also affected—for example, south-west Sydney, where high-frequency public transport routes do not exist. In order to hold down a job, people are having to pay 25 to 30 per cent of their income to meet car costs.

The other concern we have is around the future for the provision of non-government human services and the impact on services such as Neighbour Aid and community transport services, which rely heavily on motor vehicles to deliver that service. From our perspective, there is room to look at how to promote fuel efficiency in delivering those services and reduce some of the costs of vehicle use.

In terms of some suggestions on how we see this inquiry furthering the role of the federal government, the first is through looking at AusLink as the program to provide transport connectivity for households and for services in the way they deliver them. To us, it has been of concern that AusLink has remained silent on public transport funding. Obviously, we can see good reasons for the states maintaining the controlling interest in how public transport is delivered in the states, because you have to plan how that is delivered on a region by region basis. That said, we think it would be reasonable for AusLink to look at how it funds public, local and community transport through that program, particularly given that AusLink has a stated goal to provide connectivity for jobs and services. Certainly for the 10 per cent of households in rural New South Wales who do not have access to a motor vehicle, something other than a roads program would assist people to get to jobs and services.

The second suggestion we have made is that government has a role not only in ensuring fuel efficient fleet acquisition for its own vehicles but also through the programs it administers. This would have an impact on the non-government organisations it provides grants to and would show some leadership in how to purchase the vehicles and reduce fuel costs through that means. There is some scope for leadership in the purchase of hybrid vehicles, for example, through government programs.

An issue I believe has recently made some ground is around the tax incentives for non-sustainable fuel use. We have a situation at present where substantial tax incentives are available to people to write off their fuel and motor vehicle costs through the tax system but there is no similar system to give incentives for the use of public transport. From our perspective, from a social sustainability and an environmental sustainability standpoint, it is very concerning. I understand that the New South Wales government had some success in putting that on the table at, I believe, a federal level. We would be looking forward, in the first case, to some sort of incentive for people to use public transport through the tax system and also looking at the massive tax revenue forgone bill that currently exists around people claiming their car costs and whether there is some way to make that more efficient.

Aside from that, we see some scope to work with low-income households on fuel efficiency. There are already some Commonwealth programs at play—the TravelSmart and the car-sharing schemes—that I think make a useful contribution to reducing fuel consumption. Potentially there is more that could be done at a federal level in working with some of those households on how to purchase cars and how to use them, which could assist or reduce the impact of rising fuel costs for those households. Finally, as I have mentioned, the government is in a very good position to look at how community services use cars and show some leadership in that area. Our last recommendation is for some initiative through that means.

Senator STERLE—Firstly I would like to congratulate your group for the good work it does out there with low-income earners and the underprivileged. Did you say that programs are already under way on interest-free loans to allow the purchase of fuel-efficient vehicles?

Mr Wadiwel—Currently interest-free loans are not available for other items such as whitegoods. Obviously, you would have to be very careful about how you would administer that sort of scheme. But there are a number of low-income communities. An example is remote Aboriginal communities, where you have a low number of cars and a low number of drivers licences. It would make sense to me to look at a community wide perspective on how you use

some of those existing schemes, such as car sharing, and, potentially, a no-interest loan to support the sustainable purchase of a vehicle that, presumably, would have good fuel efficiency.

Senator STERLE—That has cleared up a lot for me. I was trying to think how we could offer no-interest loans to low-income earners. I just could not grasp how they would be able to purchase vehicles, and that has answered it all. That makes a lot of sense; thank you.

Senator MILNE—We are all concerned about the fact that the poorest people tend to live in the suburbs that are furthest from the centre of the city and often the ones least serviced by public transport. What is more, these people have the biggest fuel-guzzling vehicles because they tend to be the oldest vehicles. We are in a total conundrum here: we want to provide better public transport and we want to provide access to services for those people, but how do we actually go about it? One of the ways in which populists go about it is to say, 'Let's reduce the price of petrol.' What that ultimately does is work against public transport, fuel efficiency and all the outcomes we are trying to get. London and Singapore and other places have introduced congestion taxes. What compensatory measures have been put in place with those taxes to make sure they do not unduly hurt low-income earners? You have also suggested interest-free loans for transition. Do you have any other ideas about how you can maintain the fuel price so that you do get investment in public transport and the shift across but do not unduly affect the people we are talking about? This is a big conundrum that comes up time and time again.

Mr Wadiwel—The long-term solution has to be better urban planning.

Senator MILNE—Of course.

Mr Wadiwel—There are potentially some things we can do in the short term, but I believe you are talking about the medium term.

Senator MILNE—Yes.

Mr Wadiwel—It is really difficult to find a sustainable way to approach that. We have done a little work on congestion charging, and we have certainly had that concern that you do not want to penalise the people who can least afford it. We have done some research that shows that you can literally spend $100 a week on tolls in Sydney if, for example, you are a worker who lives in south-west Sydney and needs to get to the airport to work. That is the kind of expense at the moment, on top of the actual car maintenance costs, so you do not want to put a congestion charge on top of that.

What we have suggested is to target those congestion areas carefully to ensure that you are not actually impeding some of those traffic movements to jobs and services where low-income people are likely to go but also to explore things like concessions. We have suggested to the New South Wales government that if it wants to continue with tolls as its policy then it needs to look at concessions as a way to reduce the price impact on low-income users who, in this city anyway, are struggling to find that connectivity for jobs and services.

But, as I said, the long-term solution has to be better urban planning. The situation in Sydney is particularly acute, as people on this committee would probably know. The escalation in housing prices has literally pushed people into the outer metropolitan areas because of their

affordability problems. That, again, has to take a long-term solution and action from both the federal and state governments on how to preserve housing affordability in our cities.

Senator MILNE—If there was one initiative that the federal government could take in investing in public transport in Sydney to alleviate this access issue, what would it be? Do you have a prioritised wish list?

Mr Wadiwel—It would be about outer metropolitan and rural and regional areas. These are the areas where state governments have traditionally found it difficult to justify mass transit because there are not enough people living there. To me, looking at how to selectively introduce local and community transport projects that facilitate that connectivity to the high-frequency public transport routes would be a good first step.

In the US there are a number of examples where using community services to link people to jobs has had a lot of success, and that has occurred through the work programs in the US. So, again, linked to other initiatives that the federal government already has in train, there is potential to take into account that transport component.

CHAIR—Could you just elaborate on that last program—the one linking community services?

Mr Wadiwel—In the US there are some interesting examples where community transport providers have been funded by the federal government explicitly to link people in rural and regional communities to work.

Senator MILNE—Whereabouts are they? Can you be more specific?

Mr Wadiwel—I would be able to provide information on specific examples to the committee.

Senator NASH—We obviously do have a collective concern about how this is going to impact and how it is impacting on the lower socioeconomic areas. I want to take up your point on outer metropolitan and rural and regional areas. I think you said that the state government obviously has difficulty with mass transit there because there are not the numbers of people in those areas. I want to link that to what you said earlier: that perhaps under AusLink there is capacity to do public transport stuff. My question is on the role of responsibility, regardless of who was in federal government at the time. Where does the responsibility lie?

In talking about perhaps having funding through AusLink for public transport type things, is that something that would not be necessary if the state governments had planned and were doing their jobs properly? You are saying that the state governments have difficulty with mass transport because there are not the people there. Why does the responsibility then shift to the federal government if it is the states not doing their jobs? I mean this to apply to both sides; I am not being political. I am trying to figure out where the responsibility lies to provide this transport network that we are obviously going to need if we are to move away from our reliance on fossil fuels to the degree that we need to. How do we work out where the responsibility lies for doing that?

Mr Wadiwel—My first reaction is that, for NCOSS, and certainly for the households in this situation, it should not matter whose responsibility it is as long as someone actually takes responsibility for it. So that is my first reaction. I guess the other side of it is that it lies within the responsibility of federal government, to the extent that the federal government has a responsibility for the economy and the social impacts of it. To me, connectivity to jobs and services is as important a federal responsibility as it is a state responsibility.

The issue we have raised with AusLink is that it is a large federal funding program that, largely, is targeted at freight and roads. Even though it explicitly says in its objectives that it aims to link people to jobs and services, it does not do that through funding for public and community transport. There are certainly precedents for federal funding. In the US, again, there is a substantial amount of federal money available for public and community transport. So there are examples from other jurisdictions where the federal government takes a role. From looking at the terms of reference for AusLink, you would imagine that that would be one option to consider. I am not going to get into the game about who should do it, but I would say that, looking at those terms of reference for AusLink, you would imagine that that would be something the program would take up.

Senator NASH—You are right; I take your point, and we might have a closer look at that as a committee. My point is that it is easy to say that it does not matter who provides it as long as somebody does, in terms of government, but that that is a bit utopian. The decision still has to be made as to which responsibility falls where. As I say, regardless of which government it is—and it might be the reverse from the present one—if a government is doing well, then you bypass the one that is not doing well, even though the responsibility might lie there, because there are funds available from another area. So rather than just thinking, 'I will go there because they have funds to do this', we need to look, long-term, at where the responsibility for all of this lies.

Mr Wadiwel—The attitude that is taken with roads, as I understand it, is that the states chip in the most for roads but the feds take a role in funding roads of national importance. Maybe the way to think about it is where there is national importance demonstrated around funding for public transport then the Australian government has a role. Of course, we have to explore the rationale and how that is sustainable in the long term.

Senator NASH—But the issue of the impact in outer metro has come up wherever we have been—Perth, Melbourne, here, everywhere—and, if we look at the scenario in oil, prices are not going to drop, so how do we deal socially with the impact in those areas? The impact is going to be really significant. How do we alleviate that burden?

Mr Wadiwel—I should stress as well that we have not said that this is exclusively a federal government responsibility and, in terms of the advocacy work with the New South Wales government, we have encouraged them to think about the long-term social sustainability of the current situation for transport.

Senator NASH—What sort of response did you get from them?

Mr Wadiwel—In some respects I think that the New South Wales government have made some improvements, but I am not sure that they have fully taken on board the responsibility around rising fuel costs and what that could mean. We suggested that the New South Wales

government, like the WA government, could adopt a fuel strategy or something similar. They could look at the potential impacts across all the government programs and, in terms of the households in the state, look at how they strategically invest to reduce and mitigate some of those impacts. Anybody stepping back and looking at the kinds of things that people are predicting around fuel costs will say that a lot of people are going to do it tough no matter how governments react. But what is important is that things are put in train and, to us, it has to be at a state and federal level. It is certainly not just one government that has the responsibility.

Senator NASH—I agree. It is about getting those alternatives in place, isn't it? If it is going to take a third of somebody's income to fill up the car then what do we do to provide them with an alternative?

Senator O'BRIEN—It is interesting that you talk about the $100 a week toll scenario. I am told that in Sydney $100 on fuel and $50 on tolls is far from out of the question for a lot of people. It must have a significant impact on the lower income households, so we are aware of that. I am interested in your comments on no-interest loans. Isn't a better way of putting fuel-efficient vehicles into the fleet for government and other fleet buyers or lessees to take those vehicles? Within two years they would be in the general fleet and in the car yards and going through the auctions, and a few rotations of government and fleet-holder fleets would see those vehicles being purchased by the people who need a second-hand vehicle that is fuel efficient.

Mr Wadiwel—I certainly agree. To me, that is a very sensible strategy for all governments to look at. All governments could have a look at the fleet acquisition stuff and, as you say, there are flow-on effects for the market in terms of increasing the stock of second-hand vehicles. The no-interest loan scheme is something for governments to explore as an option for those communities where there is a real problem in terms of access to vehicles that are fuel efficient and where people are likely to be in a situation where they have, potentially, some difficulty affording fuel costs as they increase. That has flow-on effects for the community in accessing jobs and services.

As I said, the reality for some of these households is that if fuel costs continue to increase the way they are now then they have to choose between the job and the place of education. They have to choose whether they are going to go to a health service or not. Currently in New South Wales—and this is based on New South Wales health data—13.4 per cent of people report that they are not able to access a health treatment, a significant proportion because of a transport problem. That kind of situation is going to get worse as a result of rising fuel costs, and some of those low-income households will potentially be in that position of disadvantage. I guess to us the no-interest loan scheme is something to explore. We certainly did not scope that out as a proposal but we suggest that it is something to explore in terms of some of those communities in a place of particular hardship.

Senator NASH—Is it possible for the committee to get a breakdown of where that 13 per cent of people live?

Mr Wadiwel—Yes. I think that data is there. I am happy to send that through as well.

Senator NASH—It would be great if you could provide that to the committee.

Senator O'BRIEN—It is difficult to imagine a complete solution to the problem with rising fuel costs. One of the issues, of course, with the hydrogen vehicles, which would probably be the most fuel-efficient vehicles, is that we do not make them here and, therefore, governments would have to buy imported vehicles rather than support the domestic industry. That would be problematic for any government of any political colour in this country—state governments as well. How would the no-interest loans manifest themselves, in terms of the sorts of vehicles purchased, and how would you control that?

Mr Wadiwel—The states have already explored reduced registration costs for fuel-efficient vehicles, so it would be along those lines. But, as I said, we have not scoped that proposal out. Given that there are already schemes in place for the purchase of other capital items—although they are obviously a lot lower in cost—potentially a similar concept could be used for the purchase of those vehicles.

Senator JOYCE—In your submission you talked about the AMS Bakhtiari report on global oil production and said we could be looking at a fuel price of up to $3 a litre. For a 70 litre tank, that is $210 out of a family's weekly budget. Obviously, something has to give. What things are people likely to give up to fuel their car?

Mr Wadiwel—The NRMA report in, I think, December last year found that people are already forsaking some items, including food. It is difficult to imagine where the line would be drawn. You would wonder how low-income households that may be earning $600 a week could afford to continue to pay $210 on fuel alone—and that is without all the maintenance costs. Chances are you would give up your job before giving up some of the other things. The issue for a lot of households is that they will go into debt as well. They might not be in a position to forsake essential items. They might just put it on their credit card, which is already the reality for a lot of households in that situation. I suspect that, with some of the price inflation we have seen, we will probably see people putting it on their credit card.

Senator JOYCE—Do you believe this position is exacerbated in smaller regional towns such as Mount Morgan where, no matter where you go, it takes half a tank of juice to get there?

Mr Wadiwel—It is obviously going to be exacerbated where people do not have an alternative. We are talking about regional and rural areas, outer metropolitan areas and some metropolitan areas with poor access to public transport. It is also an issue where jobs and services are not co-located where you live and you have to travel to them. Again, that is going to be in rural and regional areas and outer metropolitan areas. So you are likely to have higher fuel costs.

Senator JOYCE—I am looking at your conclusions. Do you believe that developing a renewable biofuel alternative such as ethanol would assist in keeping the price of fuel down and provide a cheaper alternative to what is currently there? You do not comment along those lines.

Mr Wadiwel—We are not able to comment on that. It is beyond our expertise to comment on fuel. We have commented on the impacts and on what we see as some sensible strategies to reduce the use of petrol, but we have not really commented on alternatives.

Senator JOYCE—The reason I pose that question is that, for outer metropolitan areas, public transport is obviously a very reasonable way of getting people backwards and forwards to work or to health or education services. I am using Mount Morgan as an example, as it is right up there in the poverty-by-postcode matrix as one of the poorest towns in Australia—they are not going to run a railway line up from Rockhampton nor are they going to run one in from Biloela—and the people there do not have the capacity to pack up and leave. Unfortunately, the social capital of what is there is already lacking in education, and they have no capital base to move anywhere else. Has your organisation concentrated specifically on the Mount Morgan, Cunnamulla type scenarios?

Mr Wadiwel—It is New South Wales specific low income, so some of our evidence is drawn from disadvantaged postcodes in New South Wales.

Senator JOYCE—The Social Justice Commission report.

Mr Wadiwel—As you would recognise, the solutions are not easy. If there were a cheaper form of fuel tomorrow and if it were viable, that would reduce the impact for those households. We would encourage the committee not to think that the solution lies only in private motor vehicle transport, even for rural and regional areas. An example is transport to health services, which on any given day, if you count up employees and patients, accounts for a large number of trips in any area. There are smarter ways to do that, with group transport and that sort of thing. That is something all governments need to explore—how to coordinate that sort of transport, even in areas where you would not think there would be the numbers for a viable mass transit system.

Senator JOYCE—How do you coordinate that? Do you have any foreshadowed idea?

Mr Wadiwel—An example is in far west New South Wales. Basically, people living in Lightning Ridge or Bourke have to go to Dubbo to get to specialist health appointments. They are looking at 300 or 400 kilometres each way for some of those trips. Dialysis patients go to dialysis treatment three times a week over distances of 300 kilometres. Either there could be some coordination of where you put treatment centres or there could be some coordination of transport, so that rather than 10 people driving 300 kilometres three times a week people could be offered the option of a service—a minibus or something—that could take all the people at the same time.

Senator JOYCE—Is that what is happening now? Does a minibus go to Lightning Ridge, pick them up and take them to Dubbo?

Mr Wadiwel—It can happen from area to area, but it depends on the initiative of either the area health service or the community transport operators in the area. To me, this is an area where an increased role by government in how to coordinate health appointments and transport for all the people could reduce the cost of meeting that for individuals. Basically they would not need to put two tanks of fuel into their car to make it to a health appointment.

Senator JOYCE—Have you had any reports from associated charitable groups like St Vincent de Paul, the Salvation Army or others that there is now a greater requirement for their

funds due to people turning up at their door for food because they have spent their money on fuel?

Mr Wadiwel—We have not had those reports specifically. NCOSS coordinates an emergency relief forum, which is basically some of the larger charities as well as small organisations that provide weekly emergency relief to families in that sort of crisis. We have put out a call to them to try to get some information on whether there has been any increase in fuel.

As I think you have mentioned, Barnaby, it is not necessarily the fuel: people might cough up for the fuel bill but it will surface in another bill. The quarterly power bill might be the thing that they go to an agency to try to get some assistance with. So it is not necessarily clear that you will be able to get that information about fuel directly; what you might see is an increase in families seeking assistance for other things because they are trying to maintain the vehicle to access those jobs and services.

Senator JOYCE—Thank you.

CHAIR—Do you have any idea of the impact that rising fuel costs are having or are likely to have on non-government and charity organisations providing things like meals and other services where they go to the home?

Mr Wadiwel—I imagine there will be a long-term impact. We work closely with the Community Transport Organisation of New South Wales, which provides some of those door-to-door services to assist people to get to shopping and health services where they have a mobility difficulty. We would imagine that some of those organisations would be starting to feel the pinch. Obviously, your fuel costs are only a small part of your operating costs if you are running a human service; the labour and maintenance costs may take up more—at the moment, anyway—of your weekly bill in terms of operating the service. But as the fuel cost rises we would imagine that we would see that that will start eating into their capacity to provide services in the long run.

We have certainly written to the New South Wales government on this issue and said that we would like to see some responsiveness in how they fund those organisations in the long-term to make sure that they continue to provide at least the same level and hopefully a level of service that is going to meet the needs. We certainly would encourage some thinking around how non-government organisations themselves use motor vehicles and whether there is any scope for efficiencies and how they might be achieved.

CHAIR—My other question relates to cross-city transport. Transport services at the moment are usually into the city and out again, whereas a lot of people do not want to go into the city to work; they actually want intrasuburban transport. I am told anecdotally that that is a problem in Sydney. Is that the case?

Mr Wadiwel—That certainly is the case. It is a product of poor planning in the provision of public transport. For example, if you live in Hurlstone Park in south-west Sydney and you want to get to Macquarie University for a job or for education, you are looking at two to 2½ hours sitting on buses and trains to get there. Because of the poor fare integration in Sydney, the cost is likely to be around $80 to $100 per week in public transport fares. This is where you can start to

see why people in that situation will say, 'Either I buy a car to access that job or go to uni or I do not go at all.'

CHAIR—In Perth you can get on a train or a bus and can get a ticket with which you can ride for an hour and a half in a zone. It does not matter how many times you get on or off a bus in that hour and a half. That is not the case here, is it?

Mr Wadiwel—No, not at all.

CHAIR—So every time you get off and on you pay again?

Mr Wadiwel—Yes. If you are lucky enough to be serviced by the publicly owned transport network, you can take advantage of some of those integrated ticket products. For example, you can buy a travel pass allowing you to get off and on services all day for a week. But if you live in an area serviced by privately operated buses you pay each time you get off and on a bus. Unfortunately, as people would be aware, some of those low-income households live in those areas that are serviced by privately operated buses.

Senator HEFFERNAN—Do they pool their cars at all?

Mr Wadiwel—This is where we see some scope for looking at some of the existing programs like car sharing that the federal government has already initiated. From anecdotal evidence, my issue with TravelSmart and the car-sharing programs is that they have not necessarily been targeted at the people who would really benefit, which is some of those low-income households that do not have ready access to public transport services. Yes, I think that is certainly one way to look at how you can reduce the costs for those households.

Senator HEFFERNAN—What is the average journey for someone going to university? Is it 10 miles, or five miles?

Mr Wadiwel—It depends where you live and which university you are going to. If you live in Western Sydney and you want to access one of the unis in the east: Sydney uni, the University of New South Wales or UTS—

Senator HEFFERNAN—That is a long journey.

Mr Wadiwel—You are talking about between 40 and 60 kilometres.

Senator HEFFERNAN—What about if you are visiting the western campus?

Mr Wadiwel—If you are going to the University of Western Sydney, there are campuses in Penrith, in Bankstown and, I believe, in Richmond. So there is that kind of activity. But we are in a higher education sector where it is all about choice. It constrains the choice for the people who live in those areas, realistically, because of those travel times.

CHAIR—Thank you very much. If you could send in those bits of additional information to the committee—

Mr Wadiwel—That is fine. They were the health survey and the examples from the US?

CHAIR—Yes, that would be really useful.

[2.47 pm]

LAIRD, Dr Philip Glencoe, Private capacity

CHAIR—Welcome. I know, Dr Laird, that you have already heard my spiel, so I do not have to do it! I invite you to make an opening statement and then we will ask you some questions.

Dr Laird—Thank you very much for the opportunity to meet with you and try to field some questions. My submission begins with looking at some of the efforts of government over the last 30 years to grapple with oil conservation and the related issue of reducing greenhouse gas emissions in transport. As you can see from table 1 of the submission before you, there have been many, many reports. For most inquiries or events, the issue of reducing oil use in transport has proved too difficult for government. I can think of three notable exceptions.

The first one was Prime Minister Fraser's statement in 1978, which moved Australia to import oil parity pricing. The second was the government of Queensland—starting in the late seventies and continuing through the eighties—electrifying not only Brisbane but also the central Queensland coal lines. Today, that saves over 200 million litres of diesel each year. The third initiative of note is that of the government of Western Australia in rolling out heavy urban rail. Interestingly enough, 25 years ago that system was destined for extinction. It was reinstated, electrified and extended, with patronage going up from 10 million passengers per year in the early nineties to over 30 million passengers per year now. The line is due to open in 12 months time and we expect 60 million passengers a year.

In the recent decade or two, state governments, with the notable exception of Western Australia, have not acted to ensure that their capital city rail systems have expanded to meet population growth, most particularly in Sydney but also in Brisbane and Adelaide. This, coupled with no funding for urban public transport under the current federal government—but not the Fraser government in the past—has limited the effectiveness of public transport and at the same time, as my submission argues, we have had decades of low road funding and generous tax breaks. So, in effect, we are fuelling motor vehicle use. This comes at a high cost for large cities.

Last year the Bureau of Transport and Regional Economics, or BTRE, estimated the health costs from downstream air pollution—that is, mortality being premature death or morbidity from impaired health—at $2.33 billion per year, plus more for the regionals. The submission before you estimates the hidden subsidies to road vehicle use at about $11 billion a year. You can argue whether or not this category should be included and you can argue about the absolute accuracy of the figures but, at the end of the day, there is some evidence to suggest that we are subsidising motor vehicle usage to the tune of about $10 billion a year. A separate submission to follow shortly will detail the hidden subsidies to articulated truck operations at a bit over $2.5 billion per year.

What are these hidden subsidies of road vehicle use? They include the unmet road accident cost. The most recent estimate we have is for 1996, and the cost was put at $15 billion a year. You can argue how much of this is an external cost. Certainly the congestion cost for road accidents, at $1.5 billion a year, is internal but a lot of the gap between insurance pay-outs and

the cost to the nation is external. We have greenhouse costs—take it or leave it, they are whatever you want: $10 a tonne or $25 a tonne, as is used in New Zealand, or $40 a tonne. There are the health costs from too much car use and not enough exercise. These are estimated by a health expert, Chloe Mason, to be about $800 million in the city.

We have generous tax breaks—well over $3 billion a year—for motor vehicle usage. If that is not enough, we have subsidies of several hundred millions of dollars a year, made by the federal government and some state governments, to car making. Then in Queensland we have a fuel subsidy scheme worth over $600 million a year and in New South Wales we have cash given back on certain tolls. If you look at one of these subsidies, the car-making subsidy, you would think that at least the federal government would have the wit to say, 'Okay, they're for compact cars or hybrids,' so starting up a hybrid car production line in Australia instead of Australia having fleets of big cars—and even our federal, state and local governments love to buy big cars. We might even get adventurous and start putting some of the subsidies going to cars into, God forbid, buses or urban passenger rail vehicles—just a possibility!

Turning to oil prices, we have two views. On the one hand, only two weeks ago—in Parliament House at a BTRE colloquium—an officer got up and reminded us that it is projected that within two years oil prices will have got below $US40 a barrel as market forces will have come in—so we do not need to worry about it! On the other hand, we have heard these projections before—from the International Energy Agency—and we all know that the days of cheap oil are over. These higher oil prices are already a challenge to people living in Western Sydney—and it will become even worse if they go up. They are also a challenge for people in Wollongong—particularly in Shell Harbour, where I live—because so many people in the Illawarra have to commute 80 kilometres, or even 100 kilometres if they are up north—to Sydney for work. We in Wollongong have not been helped by the state government slowing down our train services last month, putting them on Valium, as it were, and by inadequately resourced private bus services.

We have a problem: on the one hand, as a caring government we do not want to push up the price of petrol even higher than it is at the moment; but, on the other hand, if we do not do anything and pretend that cheap oil will last forever—which it will not—then we are going to let down our children, our grandchildren, our older people and everyone else in a big way. As Alannah MacTiernan, the WA transport minister said, 'The costs of not acting now might be very high later.' I suggest we have to start looking at higher oil prices.

I have a suggestion for a good starting point for the committee, if it so chooses. At the end of 2003, a House of Representatives committee was taking evidence on sustainable cities. Two years ago in this city it held public hearings at the Powerhouse Museum. It reported 12 months ago—or was it nine months ago?—but we are still waiting for the report. There are seven very good transport recommendations there. If the government accepts them, that is great; if not, it might be worth the committee's while to revisit them.

In conclusion, the major problems are in the major cities, but intercity we have lots of what the Canadian Pacific Railway once called highway subsidisation. We have spent $5 billion in today's terms to rebuild 85 per cent of the Hume Highway, there is another $1 billion or so to follow and we subsidise B-doubles to run on it. What are we doing? The poor old railway line next to it is substandard, it is steam-age alignment, when the construction of a mere 200

kilometres of track to modern engineering standards—and that would be no less than what Queensland did on its north coast line in the late 1980s and the 1990s—would get rid of 260 kilometres of steam-age alignment. You would save each loco and each freight train over 1,000 litres of fuel, knock 1¾ hours off the transit time and give long-haul rail half a chance of being competitive with trucks on the Hume Highway. The potential savings are over 50 million litres of diesel a year. If perchance you wanted to electrify the line—and don't laugh: it was seriously proposed by the Fraser government in 1980 at a time of high oil prices—you would save more diesel.

Senator JOYCE—All lines?

Dr Laird—No, just the highest density ones.

Senator HEFFERNAN—Sydney-Melbourne?

Dr Laird—Yes, just Sydney-Melbourne. It was proposed in 1980 by the Fraser government. The good news is that we have two rail studies under way at the moment. One is the north-south rail corridor study, and today, being 30 June, Ernst and Young are due to hand over the study to the federal government. The second is an internal AusLink corridor study. Let us just hope that they say, 'Maybe we should be planning for corridor straightening by preserving the land now before it becomes a costly issue,' as Paul Lucas, Queensland transport minister, found out when we wanted to duplicate on improved alignment Australia's most congested single track, being from Caboolture to Nambour. He had a whole lot of pineapple farmers who did not want to give up their land, and so it is being delayed year after year. There are half a million people who live north of Caboolture who rely on that line to get their beer from Brisbane up to Townsville or Cairns, and we are stuck with this sort of sensitivity to things.

On 15 January 2004, the day the Alice Springs-Darwin railway started and the day the National Transport Commission assumed responsibilities for rail as well as for road, what happened? Premier Beattie acquiesced to a government member and said, 'We will put this project on hold.' So we need to get around that. The AusLink corridor study on the Brisbane-Cairns line has come out this month. It is about 45 pages long. It tries, in the AusLink fashion, to integrate road and rail, but the balance seems to be a bit one way—towards the rubber tyred vehicles. Although it looks out to 2015 and 2030, not once does it mention oil prices, and road pricing gets a tiny footnote.

It is the same with the BTRE report on freight measurement and modelling, released a month or two ago, on the future projections for freight. Nowhere does it acknowledge—although the BTRE did acknowledge it in a separate report—that oil pricing might have to be factored into these projections, or that, God forbid, peak oil might even be a reality. After all, Australia has already passed its peak oil stage—we have used it. Bass Strait is not as full of oil as it used to be.

So, in conclusion, we have an inbuilt bias towards roads. We need a new program of federal support for urban public transport. After all, 60 per cent of Australians live in our capital cities. In the United States, 20 per cent of their federal funds end up supporting urban transport, and, tomorrow, the government of Canada will allow fringe benefits taxation to apply for monthly or longer urban public transport passes. Finally, we need to make our transport more energy efficient, and that requires consideration of alternative transport, including rail.

Senator JOYCE—Two hundred million litres is saved by the electrification of Central Queensland railways—is that one of the statements that you made?

Dr Laird—Yes. It is the best part of that. I think the submission refers to a saving of over 175 million litres from the coal haulage alone. If you look at Brisbane, there are about 45 million passengers a year. Very roughly, the use of electricity for moving those passengers around Brisbane saves in the order of 20 million litres a year.

Senator JOYCE—So 175 million litres of diesel is saved by the electrification in Central Queensland, and that also produces a big commercial return to Queensland Rail in the process. From that you would say—apart from the fact that, obviously, Johannes Bjelke-Petersen was a very good greenie, because he brought it about—that there is a commercial return and an environmental return in the electrification of the coalfields. So it would stand to reason that electrification of New South Wales rail would bring some sort of return as well?

Dr Laird—That is a good question. When it was installed in the eighties, it was off the back of the second oil price shock. The thinking of the Queensland government was sharpened by the imposition, after 1983, of diesel excise on fuel used by railways. That pointed them in that direction. Over the last 20 years, diesel electric locomotive technology has continued to improve, now with AC traction. So, if we were to do it again, we probably would not do Nambour-Gladstone. Also, the Hunter Valley in New South Wales is the most likely candidate, with its 80 million plus tonnes of coal a year through Port Waratah.

Senator JOYCE—There was a lot of forethought into that process then. Since then, that has not been the case, basically. What about the electrification of the Mount Isa to Townsville section, which now has all the new coalfields as well as all the ore bodies that will be opening up? There must be immense benefits if we did the same thing there.

Dr Laird—There are benefits. Militating against that is, firstly, the improvement in the technology for diesel electric loco in the last 20 years and, secondly, the fact that Canadian Pacific moves 50 million tonnes a year between Calgary and Vancouver—mostly of bulks, but there is some intermodal. Every few years, it looks at electrification and is tempted, but, being a private company, it does not feel that it is commercially warranted. Very few class 1 United States railroads are electrified. There may be one or two in the Powder River Basin. It is a question of the price. If oil goes up to $100 a barrel and does not come back down again then maybe CP will electrify. Today you would not do it for somewhere like Sydney or Melbourne, but it may become a good option, and for somewhere like the Hunter Valley it would become a very certain yes.

Senator JOYCE—The electrification in Central Queensland has shown a major dividend, as well as being commercially viable. It is environmentally sustainable—and has a bigger environmental aspect—as well as being a commercially viable proposition for the Queensland government. The New South Wales government should not have done the same thing in the Hunter Valley and the Queensland government is now failing to do it in North Queensland. That is commercial bulk haulage, but what about the other side? There is no commercial return in passenger movement, is there? It is being subsidised to the hilt. Do you know of anywhere in Australia that shows a commercial return on passenger movement?

Senator HEFFERNAN—That is only because they do not pay the fare; they are all on assisted passage.

Senator JOYCE—Otherwise, no-one would get on it.

Dr Laird—I can think of one: Cairns to Kuranda.

Senator JOYCE—Cairns to Kuranda is the only railway line in Australia that shows a commercial return—as a passenger service?

Dr Laird—Probably. Let us not forget that the Indian Pacific and the Ghan are now in private hands and have to turn a profit to stay in business. They are supported with some concession passengers, but they very much target overseas and domestic passengers who can afford to pay a good fare.

Senator JOYCE—So you are implying that there is a social responsibility—there is a cost but, as a government, you have to wear it to bring about an efficient and environmentally friendly transport policy?

Dr Laird—Yes, that is the message. We have to make sure that we have true 'user-pay' and 'polluter-pay'.

Senator JOYCE—Who is paying for the trains that go across the Sydney Harbour Bridge?

Dr Laird—Basically, it is, firstly, the New South Wales taxpayer and, secondly, the users, some of whom could pay quite a bit more, particularly those going to North Sydney.

Senator JOYCE—So you think we should put up the fares on those trains?

Dr Laird—I have argued that before the New South Wales Independent Pricing and Regulatory Tribunal. There were well over 200 submissions and only two of them argued for an increased fare—RailCorp and me.

Senator JOYCE—Do you think we are getting a proper return on capital from the trains that go across the Sydney Harbour Bridge?

Dr Laird—I do not have a direct answer, but there would be a very high social cost if all the people who use that bridge were to use cars. So the benefit to the taxpayer is in reducing road congestion and all of those downstream costs like road accidents—which, in Sydney alone, cost over $4 billion a year. Congestion is now estimated to cost over $10 billion a year in Sydney alone.

Senator JOYCE—The point I am getting at is that, in metropolitan areas, there is a huge subsidisation of transport costs. The return on capital on the Sydney Harbour Bridge is not reflected in the price of railway tickets. To have subsidisation of rail is not economically unreasonable or an economic evil. In fact, it is something that is done on a massive scale in metropolitan areas. You went through your hit list of the worst cities for providing rail transport. You have said that Perth is ahead with the new train line going down to Mandurah. What major

capital city in Australia is the worst—if you like, you can give us a couple of the worst—in providing rail transportation?

Senator MILNE—Hobart has no passenger rail services.

Dr Laird—CityRail performed brilliantly at the Sydney Olympics to give us a gold-medal performance in people-moving. Since 2002 there have been a whole lot of problems and a whole lot of chickens coming home to roost. Sydney is a basket case at the moment.

Senator JOYCE—How do you reckon Brisbane is going?

Dr Laird—Operationally good, but it suffers from the fact that basically you have a line in place and, except for the airport line and some augmentation of capacity with the bridge built circa 1980 over the Brisbane River, the system has not expanded to meet the population growth, so now more and more Brisbane looks to buses. The Gold Coast line is a plus, but some would say you are merely reinstating a line that was lifted in the 1960s. Brisbane escapes the basket case label. Adelaide, although it is not experiencing strong population growth, is running on a diesel system and needs extending to the south. There is scope for gauge standardisation and it is pleasing that the infrastructure statement of the South Australian government last year actually said that it would look at it. I think Sydney stands out. Why? Because it is our showcase Asia-Pacific rim city.

Senator JOYCE—So says everybody in Sydney.

Dr Laird—It is becoming more and more gummed up with congestion. If this continues, even if oil prices become cheap again, it will not be a good scenario in 10 years. If oil prices go up then this city has major problems. They could have gone out 20 years ago and built a line from Epping to Castle Hill—that was the growth area in north-west Sydney 20 years ago—but they failed to do that. In 1980 they could have secured a rail corridor from St Marys to Glenlee. It would have cost $14 million. But they did not.

Senator JOYCE—The point is that we seem to be having the population growth, then we get the problem and then finally we come up with a plan to fix the problem. If you come up with a plan before the people move there, you are miles ahead, aren't you?

Dr Laird—It is like in WA. You have a choice: unless you secure the corridors and wait to see if they come—

Senator JOYCE—But that would be a fair statement. The way it is going at the moment here is that they get the people, then they get the problem and then they get the plan. What you are saying is: put the plan in place before the people turn up.

Dr Laird—Yes, exactly. You put the plan in place before the people turn up—and let's put the plan in place before peak oil becomes a reality.

Senator JOYCE—Or, alternatively, have the plan to put the people somewhere else. That would be a good idea too, because Sydney is a fait accompli—you are not going to fix it. The more people come here the worse it is going to get.

Dr Laird—It is not going to improve.

Senator MILNE—With regard to energy efficiency, it has been my view that we should have a national energy efficiency target. Others would argue that the market is perfect: it works on price and therefore energy efficiency is not required. Would you like to comment on the benefits and otherwise of mandatory energy efficiency targets versus a market which sets price and therefore results in changed behaviour?

Dr Laird—I guess the good news is that tomorrow, I believe, all large users of energy have to report to an agency of the federal government.

Senator MILNE—Users of more than 0.5 petajoules.

Dr Laird—Yes. That is a start, but I hope it is only a start because, at the end of the day, energy is like water—it is so important you cannot leave it to market forces. If our power goes off we are in trouble. If the oil stops flowing we are in trouble, just like if the water stops flowing. I think the Productivity Commission's approach to energy efficiency, as per their report last year, was totally lacking, as was the government's white paper of two years ago. It really needs revisiting.

We had the National Energy Research, Development and Demonstration Council in the seventies and eighties. In the early nineties it was the Energy Research and Development Corporation. They did a fantastic job. And they were so good at picking winners that people would come to them with money and say, 'Can you help top us up and we will get this thing going.' Even the humble vending machine benefited from their targeted research—and the energy, in terms of electricity, saved on an energy-efficient vending machine as opposed to a poor vending machine is significant.

In summary, I believe energy is far too important to be left to market forces alone. We need more research and development put into energy. We probably also need another White Paper because, since the last one came out, oil prices have not gone down as expected. Some of the thinking in that report was predicated on the fact that the International Energy Agency—who were, after all, the experts—had predicted in 2004 that the prices would be down within two years; they are not down.

Senator MILNE—What about mandatory national vehicle efficiency and fuel standards, and mandating that you just could not have a vehicle on the road unless it met the minimum standards? What would you do about the socioeconomic ramifications of a rapid upgrading of the fleet?

Dr Laird—I think for a start we could go back and look at BTRE books; they covered 16 areas. There was more than one on options for reducing greenhouse gas emissions in transport—that is just code for reducing fuel use in transport. One of them was on the scrapping of vehicles, assisted, say, by buyback schemes. Those micro issues can all add up to get us to the ideal. The ideal situation—and it has happened before with rail freight—is that we end up doing more with less fuel because we are smarter in the way we use the fuel. Ideally, that would be set as the target for the whole of Australia. But, in order to reach that target, you have to start measuring it,

setting benchmarks and saying things like, 'If you do not reach this, say, average fuel efficiency target by a certain date then these two or three other measures might have to come in.'

Senator STERLE—Dr Laird, I just cannot let you go unchallenged, mate. I know you are passionate in your submission and certainly in your preference for freight on rail. Without boring my colleagues, who hear this every time I come up against someone from the rail lobby, I just want to clarify a point. I am from Western Australia and we are very reliant upon rail and road freight. For our east-west link, rail is certainly the far more efficient mode and it is a damn good service. On our northern link, rail is nonexistent once you get past Geraldton. Compare that with the analogous link between Melbourne and Sydney, the Hume Highway. You see the Hume being done up and there is a train going past. What scares me is the thought of junior bureaucrats sitting in the NTC thinking, 'It makes more sense to go on rail and get off the road; we've got to put up obstacles.'

The Australian consumer is used to being able to put an order in by telephone—whether it be for freezer-chiller, general freight, livestock, furniture, car carrying or whatever—and get an ETD on when the road freight will leave Melbourne or wherever and an ETA on when it is going to be delivered. With rail—and I know this for a fact, first-hand—they can tell you how long it is going to take the train from leaving point A to get to point B, but you are very restrained on the loading and unloading. The rail industry is nowhere near competitive with road on door-to-door service. What the rail industry does—and I am boring my mates here—in certain areas it does very well. Listening to the rail lobby, you hear of this belief that rail transport will always be able to compete with road transport on service. But in a lot of the market it cannot. I will have to engage you in conversation on that.

Dr Laird—Rail has been through a lot of reform in the last 20 years. Indeed, WA was one of the leaders in the commercialisation of rail freight in Australia. But, despite privatisation and the best efforts of the Australian Rail Track Corporation to upgrade the track, it still has in some areas some way to go, as you mentioned. It is possible that Pacific National can tell you where your freight is at a particular time. Ten years ago, National Railways was certainly working to that and was investing in the IT to deliver that result.

You are right about the terminals. These are real choke points against efficient intermodal operations. In respect of further choke points concerning rail congestion, in parts of Sydney we have to have freight train curfews. The receival of coal at Port Kembla from Lithgow, west in the Blue Mountains, is impaired nine hours a day because of freight train curfews. It comes back to the issue of better intermodal terminals. Here we are in Sydney, a city much bigger than Toronto, Canada, yet in Toronto Canadian National have at least two intermodal terminals. Canadian Pacific have at least two. One was opened in 1991 and has been expanded since at least twice. Today every time—like National Railways 10 years ago—someone else wants to expand or build an intermodal terminal in Sydney, it is the end of the world: you have got local government complaining and you have got the state government taking sides—and the whole thing is choked up.

It is like the Caboolture-Landsborough thing. We almost need a COAG process to override recalcitrant state governments, just to get some efficiency into the system. The truck companies know no state boundaries, except for a few regulations—and there are a lot fewer now than there were in the 1980s. Take the cost of the inefficiencies as a result of a multiplicity of state based

regulators for rail safety, on the one hand, and access arrangements, on the other hand—and then there are the communication systems. It is a recipe for putting more freight on the road, even with all the road safety costs. In my submission I have a university calculating the cost using BTRE data and other data. The cost of accidents involving—not caused by but involving—articulated trucks averaged out at 0.6c per net tonne kilometre. For rail it was one-twentieth of that, 0.03. For Queensland it was even less. It was 0.02.

Take fuel: line haul rail freight is three times more energy efficient than line haul trucking, although B-doubles would reduce that ratio a bit. We need to drive some of these inefficiencies out of our system. After all, we are only 20 million people and we have to compete on the world stage. We are going to be more and more dependent on international competitiveness to support our fuel bill. We could end up in a situation like New Zealand's, where people like to drive so they have to keep on importing fuel. It is a significant part of their imports. It pushes their dollar down, so they have to pay even more. Now they are paying $1.70 a litre.

Senator STERLE—But in this day and age in the freight industry you cannot and you will not win the argument saying, 'If you come with us there will be fewer accidents,' or convince someone to send their freight by rail and people to shop according to the pick-up and delivery times of rail. You make it sound like: governments, federal and state, chuck a lot of money at rail infrastructure and all of a sudden everyone will start using rail to shift their freight. They will not.

Dr Laird—It has to be more user pays on the road and a bit more on the rail. We have decades of neglect—mostly state government neglect in this state and Victoria—of rail. The reason why the north-south corridor works so poorly is the steam age infrastructure and the rail congestion in Sydney. Would you believe that from Casino to Acacia Ridge near Brisbane they are still using electric staff installed in 1930.

Senator STERLE—Yes, we read that in an earlier submission.

Dr Laird—Whereas in the east-west corridor the Menzies government contributed handsomely towards not only gauge standardisation from Kalgoorlie to Perth in the sixties but also straightening with a major deviation down the Avon Valley. Then Australian National, a federal entity, over 25 years concrete resleepered the Nullarbor Plain and kept on going through Adelaide up the Adelaide Hills to their border. Then you had the Keating government with the One Nation program with Melbourne-Adelaide gauge standardisation. Those are three examples of federal support. That corridor now literally sings. Across the Nullarbor you can hear the trains. On a Sunday it is almost like Pitt Street as Pacific National's trains head off to Perth with everything from Melbourne and Sydney; you name it—beer, designer label frocks—it is all on those trains. They win 81 per cent of the market. It is not just the competition that does it; the infrastructure through three injections of federal funds over three decades has brought that almost to fit for purpose—you could still usefully ease the grades in the Adelaide Hills.

Look at the poor old north-south corridor. It is steam age between Sydney and Melbourne, our two largest cities—honest to goodness. We have done a study at the university. The track was built in the 1870s from here down to Albury by a man called John Whitton. He liked his track straight. He refused to build substandard stuff like wooden trams on narrow gauge. He waited until the politicians would give him a bit of money then he compromised on the grades. In the

1870s he built the track between Goulburn and Whitton. At the university, with the help of a friend who was before you this morning, Mr Max Michell, we simulated freight trains going over past track, present track or future track. We can work out how much time a freight train of a given load and composition will take to do a certain section of track, how much fuel it will use and how much braking effort is required. Would you believe that a modern superfreighter going over the 19th-century track would be 12 per cent quicker and use 12 per cent less fuel than using what is there today. If we were to get a thing called a bulldozer—and John Whitton, colonial engineer, would have loved a bulldozer—and go through his alignment and put it through at one in 60 rather than one in 40, we would get a 25 per cent improvement on what is there today.

Senator STERLE—I have one last comment—and you, Senator Siewert, coming from the same state as me, should take a close interest in this. While they are all singing out on the Nullarbor, I will be interested in the songs that get sung if the owners of specialised container transport say to National Pacific one day: 'We don't want to play anymore. Would you like to buy us?'

Dr Laird—You would then be looking to Senator Joyce's home state of Queensland and Queensland Rail National to provide the competitive tension that helps to keep the beer price down in Perth!

Senator NASH—One of the things you point to in your submission is the possibility of restoring fuel excise indexation. This committee has spent a lot of time talking about the impact of high oil prices on the lower socioeconomic strata. Wouldn't that just make it worse? Wouldn't that impact most on the people who can least afford it?

Dr Laird—That reminds me of when I was a member of a conservation group early in 1978 and thought that, being a good green group, we should put a proposition to the government that it bring in parity pricing. That was shot down by other members who were more sensible than me. They said it would impact too harshly on the battlers. As it happened, Malcolm Fraser's government took that decision. At the end of the day, we either have cheaper prices now or real pain later. I think New Zealand was right. In 2001, with the huge pain post GST, the government of the day said they would give us back 3c later. Why didn't they just leave the indexation on? No, they said they would take that off as well.

The committee might like to find out from Finance how much revenue we have forgone because of petrol not being indexed and whether, in their judgment, it would have been better for the battlers. I would argue that it would have been better if this had been maintained and ploughed into more productive transport infrastructure, better roads and better railways. I think New Zealand got it right. Helen Clark put the price up in February 2002 by 4.7c a litre and by another 5c a litre a couple of years later. I certainly feel that America has got it wrong in selling it so cheaply. In fact, I would go further and say that, had America been pricing fuel more at European levels than at their present low levels, the world would not be using 80 million barrels a day and we would probably not be having these spikes. But we cannot solve that problem; only they can solve it.

Senator NASH—True. But there is still the difference in the distances travelled in Europe and America. The distance travelled in Europe is minimal compared to some of the distances they

have to travel in America so, surely, if petrol were the same price, the impact would be a lot greater in the areas where they have to travel such great distances?

Dr Laird—The price should be moved towards European levels; it should not be at European levels.

Senator NASH—I take your point.

Senator O'BRIEN—It is also to do with the size of vehicles in the US.

Senator NASH—Yes.

Dr Laird—If you need subsidies for transport, it is better that they be explicit. Let us start internalising this $2.3 billion a year of health. Let us start knocking away some of these ridiculous tax breaks for motor vehicle use. If we are going to have tax breaks on motor vehicle use, let us have just one or two for public transport use.

Senator MILNE—Clearly, congestion tax has worked effectively in London, Singapore and other places. If you put congestion tax on a whole city, you might cause considerable dislocation. Modelling has been done on applying a congestion tax in Sydney in various ways. Do you have a proposed best-case scenario model for a congestion tax for Sydney?

Dr Laird—Unfortunately, I do not. But with every year that goes by it looks less unattractive.

Senator MILNE—Absolutely.

Senator O'BRIEN—How much do we need to spend on the north-south track to get it 'singing', as you put it?

Dr Laird—Over the next three years the ARTC is spending about $1.8 billion—and that includes Hunter Valley coal lines. I think that should only be regarded as the very first stage. It would be very useful to direct them to start advanced planning of the deviations that can improve efficiency in time. Queensland did it 15 years ago for $1.3 million per kilometre. It would now cost at least double that—perhaps $3 million or even $4 million. So for 200 kilometres of new track it would cost $600 million to $800 million. You would need a similar amount for the North Coast, and one level of government or another would need to look at Hornsby-Gosford, the nation's most congested piece of double track. So we are looking at another $2 billion at least. But when you consider that we have already spent $5 billion in today's terms on the Hume—with another $1 billion to follow—and $5 billion on Sydney-Newcastle and the Pacific Highway in two states, I do not think it is a bad investment at all.

Senator O'BRIEN—Do you think there is any prospect of commercialising that and obtaining a return through track access fees?

Dr Laird—Not on today's road prices. A merchant bank could not look at it whilst road pricing of heavy vehicles is at its present level; it is just not there. Where it did get up, under very special circumstances with the support of three governments, was the Alice Springs-Darwin railway. Incidentally, that was built for $800,000 per kilometre, but it was built to a lighter

standard than what you would build here. In short, at present road pricing levels it will need government support to secure the funds to make the investment for the improved efficiencies and the improved modal share—and you need improved terminals as well.

Senator O'BRIEN—But, in the interests of the nation, it would be a wise investment, however you managed it?

Dr Laird—Certainly on Sydney-Melbourne. And there are some other issues to address. On Melbourne-Albury, ARTC is spending valuable funds—theirs and ours—on building huge passing lanes on their standard gauge line when, next door to it, there is a perfectly good broad gauge line which could be standardised, except for the fact that the Victorian government leased it to an American company. It has now been leased to Pacific National and, surprise surprise, they are not too keen—perhaps they get too much from the Victorian government in track access fees for passenger trains. When you sort out issues like that I think that, whether or not we build the Melbourne-Parkes-Brisbane inland route, there is a very strong case for giving Sydney-Melbourne, the railway linking our two major cities, a much better standard of line than what we have at the moment—and that would includes 200 kilometres of track built to modern engineering standards.

CHAIR—Thank you very much. You said that you would send some additional information. If you could send that to the secretariat that would be much appreciated. Thank you for your time this afternoon.

Dr Laird—Thank you for the hearing today.

[3.40 pm]

BELL, Dr Philip John Livingstone, Manager, Research Innovation, Microbiogen Pty Ltd

CHAIR—Welcome, Dr Bell.

Dr Bell—Thank you for giving me the opportunity to come and talk about what we do. I am a co-founder and currently a research scientist at Microbiogen. As background, I am a geologist as well as a molecular biologist geneticist and I have a biochemistry PhD. The company I work for, Microbiogen, is focused on developing the technology for lignocellulose to ethanol. That is our sole focus at the moment and that is where we are trying to progress. When you build a company like ours you have got to work out what can make it a viable business model. For us to start this company, one of the things that we needed to do was research as much as possible all of the issues that we are talking about here with liquid fuels.

Australian oil production, according to Australia's own reports on it, is in decline, and that is despite $750 million a year being spent on exploration. If you look through the data you will find that we do spend an awful lot on exploration. To give you some idea, that is larger than the entire research budget for the ARC, which is the science budget, so we are spending significant amounts but we are not replacing the oil that we have already found. Why? There are geological constraints on oil in Australia. It is not as though Australia is not a major minerals country with major iron ore deposits; the geology of Australia has been worked out thoroughly over the last 20, 30, 50 years. The areas that are prospective for oil are very well known. Basically this means that it is unlikely we are going to find large new oil deposits in Australia to offset the decline in the fields that we have got already. It is possible, but I do not know which basins they would be looking in; the most prospective ones were all found very early. I believe that Bass Strait was found within a couple of years of the first drilling programs going on in Australia because it was the obvious place to look.

What it means ultimately is that Australia is going to be completely subject to world global oil supplies, and so of course we want to look into that. You can get many different opinions and I am sure that all of you have looked through lots of submissions and various other things. I have got a report here, which I found on the web, which is a very good one. It goes through the giant oilfields in world—the Ghawars, the Burgans, the big fields. It goes through when they were discovered, how much oil is there and where they have discovered new oil recently. It is very obvious when you look through these that we are not finding anywhere near the amount of oil that was found in the early 60s. There was much more oil found then. This is despite the fact that now, since the 60s, technology has moved on a long way. You can do Google World if you want and you can look over the entire world, so it is not as though they do not know what the world has got now. You have to question why they are not finding giant oilfields. Of course, the conclusion you can come to is that they are getting harder to find because we have found most of the major ones.

The giant oilfields are the ones that are of crucial importance because they represent more than half the oil in the world. The ones in the Middle East, which represent most of the giant oilfields—in Saudi Arabia, Iran, Kuwait and that area—are the key. Over the last 10 years the

biggest field they have found is in Kazakhstan, which is a good place and prospective, but it was less than one-tenth the size of the Ghawar field and that was found in 1948. So it is a very long time since they found fields as large as the ones they found in the Middle East from the 1940s to 1960s.

The concept of peak oil is not exactly new. I just got a *Scientific American*, published in 1970, I believe, and it has got one of the original articles by the Hubbert guy who did the Hubbert peak. In 1970 he was predicting that world oil would peak around 2000 or 2005—sometime around now—and it is surprising to find that a lot of people are starting to agree with that, especially the geologists who know about what the constraints are. So it is not a new concept; it has just been ignored in the economic analysis that people do. They say, 'If the oil price goes up, you look for more, you find more and the price goes back down again.' But there are geological constraints in the world. You can fly to Europe or you can fly around the world; you know the finite size of the earth.

The economic analyses run big risks, like that contained in the ABARE report of 2003 which did not appear to take into account geological and geopolitical factors in the oil price. They still appear to have missed these points, because they claim that the oil price today is about $25 a barrel, which is not true—it is nowhere near true. If you were basing a business on the price of oil and it went up three times when you were telling everyone that there was no chance it would go up, you would be out of the business. So we have to be very careful when we look at pure economic analysis of these sorts of situations.

The best report that I have found for what the consequences of peak oil would be is the Hirsch report—I am sure you have all got copy of it, or you should have a copy—written by the US government. If you read through that—I was one of their consultants—you will find that it is all about the consequences of peak oil. The report does not take in any argument about greenhouse gasses. It says: 'We're not going to even worry about whether we do greenhouse gas damage to the planet. We are just going to say what would happen if oil peaked, how quickly could we bring on line all of the replacements that we would need and how could we cut down our demand and increase our supply of oil, even if we use coal liquefaction or any other of those sorts of things.' Its conclusions are basically that you need to start a concerted effort at least 15 years before oil peaks, otherwise you are going to have a deficit in the amount of oil. If we have a deficit, then demand and supply—the market forces—will work very well and the price will go up. It is crucial.

The factors that Dr Hirsch takes into account are things like how long—and I heard a presentation about this this morning—it takes to build a plant for gasification then coal to liquids. It turns out these plants take a long time to build and they cost billions of dollars in capital. When your economy has been ruined by an oil price rise, it is going to be very difficult to raise the capital to quickly build this sort of infrastructure. I believe that a new oil terminal to do the refining takes in the order of 10 years to build. It is a very complicated and very expensive process. So you have to prepare well in advance. Basically, in this report, under all the scenarios that he comes up with, massive mitigation schemes should be undertaken, starting right now. This is simply due to the scale of the problem: when it hits, it will be very big. How do we replace in Australia 700,000 litres of oil a year? It is a lot of oil.

That is a problem, I think, for the political system, which you are part of, because it is well and truly outside the electoral cycle. If you inflict pain on people today for a benefit in 15 years, it makes it very difficult for you to get re-elected, I imagine. So it is a problem with our political system that we do not have the ability to look at the 15-year horizon, and that is the sort of horizon that is needed to approach this major world problem.

As I mentioned, Hirsch report does not incorporate any greenhouse concerns at all. It does not take into account that if you are using coal to make liquid fuels you need to take four kilos of coal to make one litre of petrol. The problem with that is that, unless you can get geosequestration to work very well, you are going to have a problem with the amount of greenhouse gases you are producing. In addition, everyone talks about our massive reserves of coal—I have forgotten what the exact data is but it is about 250 years at current rates—but we are not going to stay at current rates if we are start replacing the oil with the coal to liquefaction. Similarly, there is a lot of energy involved in getting oil out of oil shale and tar sands, otherwise people would be doing it now. It is only a few dollars a barrel to get the Saudi oil out of the ground, whereas oil shale is going to cost you minimum $40 a barrel just to process.

As to alternatives, I will concentrate on biofuels and, in particular, ethanol, because that is what we are specialising in. I would like to point out that there is no doubt about the ability of ethanol to be used as a fuel. You often hear it argued that it is bad for your car et cetera. Brazil and the USA are absolute proof that you can use 10 per cent ethanol in your car any time you like, mostly. They are using it as a fuel; there is no doubt about it. It also has many advantages as a fuel. It burns extremely cleanly. I do not know if anyone saw it but a few years ago there was a big fire in a terminal in Melbourne. Manildra's ethanol factory started burning and thousands and thousands of gallons of the stuff burnt. What you noticed was that there was no smoke. It was completely clean because ethanol provides its own oxygen. It does not make soot when you burn it. That is one of its advantages as a fuel.

One of the major problems with the current industry that we run today is the sheer size of the industry that will be required to replace a significant amount of fuel. The reason for this is twofold. First of all, if we use sugar cane or corn, as in America, we are competing with their human food usages. That is, of course, a problem. I believe that the two billion gallons that the US used in 2003 represented 15 per cent of their corn crop, and it is going up all the time. You cannot keep using all of your corn crop to make biofuels. You cannot replace the entire oil supply using corn—or sugar cane, for that matter. So the scale of the industry is a major issue—you cannot make enough of it from food.

I went to an ethanol conference a couple of weeks ago. The US is apparently putting in 39 new plants this year alone, each with about 200 million gallons per annum productivity. To give you an idea of that, working on four litres per gallon, each one of those plants represents more than Australia's 350 million litre target.

Senator JOYCE—Each plant?

Dr Bell—Each plant. If you set a low enough target, you can achieve it!

CHAIR—Apparently not!

Dr Bell—But, anyway, you hope if you can sell it. The rough calculations we have done on the sugar and the conversion rates to ethanol et cetera—

Senator HEFFERNAN—What is the cost to the food chain of the American program in the longer term? Will they be worrying about how they will feed themselves?

Dr Bell—No. One of the factors in the US that mitigates a lot of those problems is that they are converting corn, which has a lot of starch and energy in it that they do not need. It is protein that you want in your cattle feed. So they are converting the starch component of the corn into the ethanol and the rest of it, the proteins, go through to the animals anyway.

Senator JOYCE—So they get the benefits of the animal feed and the ethanol?

Dr Bell—Yes. They are getting large quantities of what they have usually called dried distillers grain, but now they are starting to try to sell wet distillers grain because it cuts down the amount of energy you have to use.

Our company is looking at the lignocellulose type solution to the problem. I am sure the committee has looked into it a little bit. Basically, any plant biomass is composed of three different types of components. There are lignums, which are complex aromatic ring type structures, and there are cellulose and hemicellulose, which are both sugar polymers. You can break both of them down into sugar monomers and then you can ferment them into ethanol. That means that lignocellulose can be used as a substrate for producing ethanol.

No-one does it commercially at the moment because of two major problems. The first is the breakdown of the lignocellulose. The second is the fermentation of sugars. In fact, the whole chain is still a problem. The cost of the raw materials is very low, because a lot of it at times is waste. In the sugar industry it will be bagasse. In the pine tree industry it will be the thinnings. It will be newspapers. All those things that you have to recycle or get rid of somehow today you will be able to convert into fuels. The problem is that plants have gone to a lot of effort over evolutionary periods of time to be not able to be broken down. If you look at the table in this room, for example, it is probably 100 years old; I do not know. Microbes cannot attack wood very easily. It is designed not to be attackable.

That is one of the problems that must be overcome. You must work out ways to loosen up the structure of the wood or other biomass so that it can be broken down into the sugars. That is one of the expensive parts of the program. At the moment, they use many different methods: steam explosion, ammonia processing—all sorts of things. They are all still problematic but they are getting better all the time. Because there is no industry at the moment, the size of the R&D effort going into that side is not as big as it would be if there were already an established industry. So it is likely that once that gets established these sorts of prices will go down.

The second side—the side we have focused on over the last five or six years—is the fermentation of sugars. The glucose portion can be fermented rapidly and easily into ethanol—no problem. But currently there is no organism in the world that can ferment the hemicellulose, which is called xylose. It is a five carbon sugar. You cannot ferment that very easily at the moment at the rates needed or the yields needed to make it industrially useful. The problem is

that that represents about half the sugars you are going to get. So some organism must be designed to ferment those sugars, and that is what our company has been doing.

We have specialised—we have just got patent position on it—in the ability to ferment those sugars with a non-genetically engineered standard bakers yeast strain. We have done some very hard work of breeding and we have been able to convert a strain of saccharomyces, which normally cannot touch xylose, into a strain that can. Through non-GMO methods—just pure breeding—we have now got yeast which is gradually getting better and better at converting the xylose into ethanol. That is one of the things that is needed for this whole process.

Although we cannot make the alcohol levels that we really want to right now, we expect that in about 18 months we will be able to. One of the advantages of the way we do it is that right now we can start converting that xylose material into things such as yeast feed that will have no problems getting through regulatory constraints because it is not genetically engineered. In other words, we can grow the yeast on the xylose right now, economically, we think, and start using it as a feed yeast—as a supplement. As I was saying, one of the problems is that the protein content of your feed is very important. Yeast, when it grows on the xylose, basically converts the sugars into fairly high-protein-rich media. Dried yeast goes for $2 to $5 a kilo as a feed supplement and we think we can start converting the xylose into that feed supplement and we can start working on—

Senator JOYCE—You genetically made this yeast?

Dr Bell—No, we did not use any genetic engineering. Through some very hard work we made a little discovery—

Senator HEFFERNAN—Do not tell him how you did it.

Dr Bell—You can read our patent.

Senator JOYCE—I am thinking about *The Day of the Triffids.* I know this is ridiculous but I am going to ask the question anyhow: if this yeast gets out, does it have the potential to break down all the stable structures in society, which we do not want broken down?

Dr Bell—No, it will not be attacking the wood.

Senator JOYCE—Like you have invented a new termite.

Dr Bell—That is one of the reasons we took the non-GM route—we did not want to introduce genes that were not already there. If you put our yeast on this wood or on sugarcane bagasse, nothing will happen because that sugarcane bagasse is in a polymer form and our yeast does not have the enzymes to break down that polymer. It cannot use that sugar. You could put as much yeast as you like on it and it will not do anything. What it means is that we can have a non-GM method to generate the yeast strains for doing this. That is what our company is based around, and that is our business model. We are now in a position where we can start researching that.

At the moment, it is our opinion that a country like the US is going to be well suited to use our technology straightaway because they have a well-established ethanol industry, albeit on corn at

the moment. The transition will be very minor for them. But in Australia, it is very difficult to get people to buy the ethanol fuel off you. The infrastructure that needs to be built is not being built and so Australia is going to be left behind on this. Obviously, it is a global problem; it is not an Australian problem. In fact, Australia is probably one of the world's best positioned countries, if you do not mind the greenhouse gases, in energy supplies. The US realises its dependence on oil and it also realises that there are real significant geopolitical risks that Iran is going to try to do something. They have control of the Straits of Hormuz where most of the oil in the world comes through. What if there is a war or if anything happens in that area? We need to think in advance of that rather than thinking: 'Oh, it has happened; what can we do now?' We think it is a global problem and obviously we would be happy to do it in Australia but we do not think policy settings here are favourable to do alternative energy at all.

Senator NASH—Your last comment was that the policy settings are not favourable to renewable fuel. Can you expand on what you mean by that?

Dr Bell—We are not trying to produce ethanol ourselves. But, having gone to things like the ethanol conference, I have heard the number of complaints from speakers on the floor: 'We would build an ethanol plant if we could guarantee sales.' But they cannot guarantee sales, and unless you can guarantee sales the bank will not lend you the money. I believe Manildra has a capacity of 200 million litres and they are only working at 40 per cent because they cannot sell it. You can make as much as you like; if no-one is going to distribute it and you do not have the infrastructure yourself, you cannot sell it.

Senator NASH—It has become a real bottleneck, hasn't it? We have people wanting to produce—and not just the current producers but all the people who want to come online and produce renewable fuels—and we have a country that needs us to seriously embrace renewable fuels because of the oil capacity and where that is all at, and there is this bottleneck in the middle, stopping people getting from point A to point B. We have these producers who want to produce it and these people at the end that it is going to benefit greatly and it is bottlenecked in the middle.

Senator MILNE—It is the same with the whole renewable energy sector.

Dr Bell—Biodiesels, MRETs—everything.

Senator NASH—Absolutely, yes.

Senator MILNE—Yes, MRET—everything is the same. I think it is really exciting and it is fantastic to hear about the new technologies, the work that is going on and that conundrum about food security and ethanol as things that have really absorbed people's minds. This cellulose route is what we need to take, and there has been a lot of work done on algae as well in a similar vein, so there is huge potential. I was interested that you mentioned newspapers in the course of that. Can you just elaborate on that? I think that is really interesting.

Dr Bell—Newspaper pulp is basically a relatively low-grade pulp because, as far as I understand, you make it just to last for one day—to read it and put the chips in it the next day. So it is not really a good recycling paper pulp, but I think it is a mechanical pulp. They do not chemically alter it, so it has the composition, essentially, of the wood that you put in there—

except that you have ground it up into a paper form, which makes it ideal for converting into ethanol, because you have already done the hard work of grinding away a lot of the physical structure of the wood. So we are working in our labs on using newspaper. We are doing acid hydrolysis and making sure our use can cope with that. It is one of our target areas, and we think there is a great opportunity in a city like Sydney, where you have lots of paper. As far as I understand it, newspaper is not an ideal substrate, so the paper recyclers do not really want all that much of it. Why not convert it to a liquid fuel or at least start the ball rolling on that?

Senator MILNE—I see this as a huge opportunity, because recycled newspaper is a huge resource that is really not being adequately dealt with. Is it feasible, for example, to establish a plant like the one you were talking about co-located with part of a municipal refuse-recycling facility—that kind of idea?

Dr Bell—I think that would be ideal. Our idea is basically to set up near a recycling facility or in the cane fields, because it turns out sugar cane is one of the best plants in the world in its efficiency in capturing sunlight and turning it into biomass. In a sugarcane facility, you are already going to crush the cane anyway and you are already going to have that bagasse arriving at your plant, so there is no extra cost. We would see that one of the easiest ways to get into the lignocellulose business would be to go to one of those plants and start taking a stream of the bagasse to convert. If they are also making ethanol with their molasses, for example, then it makes a very synergistic model for starting the first plants off.

Senator MILNE—Given the fledgling state this idea is in, what is your ideal, best-case scenario for a couple of pilots? Is the best-case scenario co-location with a sugar-processing facility? Where are you going to pilot this? I hate the idea of piloting stuff overseas. It probably has to happen, but I am really interested to know what your best-case scenario would be if options were open to you.

Dr Bell—If all the options were open to us, I think the best place would be in the sugarcane industry. We have already done some modelling to suggest that we could at least start a process—which may not be economic from day one but would be working towards that—based on a sugar mill; we have looked at the sizes and those sorts of things. As I said, that is in our ideal situation. But the inability to sell the alcohol makes it difficult for them to do that.

Senator MILNE—We understand all that. We have been fighting that for some time. My question was really just this: from where you are with the technology, what is your best-case scenario? You are convinced that within 18 months you will get it to the levels you want it to be at. I understood that from your—

Dr Bell—We will get yeast that can ferment the xylose. With our process, we really only need to get to one to two per cent alcohol on the xylose, because we envisage a process where we would be using the xylose to make the yeast biomass, using a little bit of the xylose to make some alcohol, and then using the yeast biomass built on the xylose to do the fermentation of the cellulose portion. If you were to throw in a bit of molasses to make it so that you can finish off the fermentation to, say, eight to 10 per cent, you could distil it economically.

Senator MILNE—Given the current policy settings, what is your next step? You have patented the technology. Are you actively collaborating in the United States or Europe, or somewhere where the policy settings are more favourable?

Dr Bell—We will be, yes. We have only just started. As you know, in Australia alternative fuels and ethanol are not seen as particularly robust, dynamic new things, whereas they are seen that way in Europe and the United States. So we had to arrange to raise money, and now we are in a position where we can start talking to these people. We do not want to be in a situation where we lose our technology because we have to sell out on it. We are now in a position where we will not have to. Starting from last week, basically, we are now in a position to start exploiting this or trying to get those sorts of things going.

Senator MILNE—So would it be fair to say, in commenting on your technology, that the policy settings in Australia are such that you are being forced offshore?

Dr Bell—I will only say that it makes it a real challenge to do it here.

Senator JOYCE—Thank you very much, Dr Bell. Obviously, we have saved the best until last. It has been very interesting listening to what you have had to say. There were a couple of interesting things you raised. Three dollars a barrel is the cost of getting oil out of the ground in Saudi Arabia and they sell it for about $70 a barrel. If my maths is correct, that would mean that the proper price for petrol is really 6c to 7c a litre, plus refining costs, transport and government excise. So, if we say that that is the case, the price of fuel is really around 40c to 50c—and you will see where I am going in a second—and the margin between 40c to 50c and, let us say, the $1.40 it sells for on the street is profit, to entities from the well-head to the bowser. It is made up of profit, exclusive of government tax. That being the case, if 40c to 50c is about the price of fuel, it is no wonder that the oil companies do not want to utilise ethanol. Why would they utilise a product that they are going to buy for 70c when they have one on which, through transfer pricing and related energy structures, they are actually making a greater gain?

Even though they say, 'The terminal gate price is the be-all and end-all,' the fact is that, at the terminal gate, they buy it from themselves, who buy it from themselves, who buy it from themselves. So, unless we mandate ethanol, they will not do it, not only because it would bring a competitor into their market but also because it just would not show the return to the overall related entity structure that the sale of fuel would do.

Dr Bell—I think that is a little bit untrue in that that low value for the price of getting crude out of the ground applies to the very best of the oil wells. But, since you have to provide 80 billion barrels a day—or whatever it is; some huge amount of oil—obviously there are a lot of wells around the world which are not producing it at anything like that cost. The market mechanism says that, obviously, they can sell it for what they can get for it, but on average there will be a lot of wells that will be much more marginal. I do not know what the price is for oil here in Australia, but I imagine it is nowhere near what it is elsewhere. That is talking about the very best wells, where it just spurts out of the ground and you have huge reservoirs, but a lot of the other oil is harder to get to.

That is what we think will happen. As the oil price goes up, you will start going for things that are increasingly hard to get out of the ground until you get to that energy return on investment

thing, the ROI, which means that at some stage you say, 'It is costing us more energy to get this out than it is to go,' and then you stop doing it. I think the very cheapest, best wells in the world would be extremely profitable at the moment. But it is making some marginal wells work, and that is how you are making your supply up, I would imagine.

Senator JOYCE—Good. In that case, I will head off in a different direction. I will be deliberately antagonistic and pose a question—not to be quoted in the papers tomorrow morning as supporting this. In that drive to search, if we do not have an alternate product to a mineral based oil then it stands to reason that we will have to start looking for oil in far more different places. You have mentioned the Ghawar oil fields and the Burgan oil fields. They have not been audited since 1973, so we have no idea what is there. So we will have to start looking for oil in different places. Ultimately, the economic ramifications mean that the political pressure to start looking for oil in places such as Antarctica, the Great Barrier Reef or any other potential site will start to build unless we develop an alternate biorenewable fuel source. Is that a fair statement?

Dr Bell—Yes.

Senator JOYCE—If you are not going to use oil based fuel, what are you going to use? Therefore, you have to find it.

Senator MILNE—You could go to war for it.

Senator JOYCE—I am not for it at all.

Senator MILNE—No, I said, 'You could go to war for it.'

Senator JOYCE—There is the economic motivation that if you do not want to have the environmental implication of exploiting a new area that you possibly did not want to then you have to find a biorenewable alternative. To the best of your knowledge, have there been any signs in the Ghawar oil fields or the Burgan oil fields that they might be past the Hubbert's peak, that they might be starting to get gaseous inertia or water based inertia in any of those fields?

Dr Bell—I can only state what I have found on the World Wide Web. The report is that Burgan is in decline. I believe one of the giant ones in Mexico is also in decline but I am not sure about the Ghawar fields. But that is only from the internet and I have no personal first-hand knowledge.

Senator JOYCE—The Ghawar oil fields being in Saudi Arabia, have they found any oil approximate to the Ghawar oil fields in any of the countries bordering Saudi Arabia that have previously been unsuccessful in exploration for oil?

Dr Bell—I do not know.

Senator JOYCE—Each of the US 39 plants brings on more oil per year than our 2010 goal of 350 million litres.

Senator MILNE—That is what our last target was.

Senator JOYCE—Each one of those new plants is our 2010 target?

Dr Bell—What was said at the conference is that they were 200 million gallons per year on average and that if you assume four litres per gallon, it comes up as more.

Senator JOYCE—Why do you think we have a pitifully small target which the oil companies have absolutely no reason to meet, in any case? They are not mandated to it; it is just a target. Do you have any ideas as to why we have such a small target which, even though it is small, has no penalties for not reaching it?

Dr Bell—I am surprised that the target is so low and I am surprised that it is voluntary. But I have no idea. I imagine the people in the parliament would have a better idea of this than I do.

Senator MILNE—In the party room, Barnaby.

Senator JOYCE—They might have heard my ideas on it! Do you know any other Western country in the world that has the same lack of intent to find a biorenewable alternative to oil as Australia? Is there another country in the world that you can think of that would be as slow as we are on the pick-up of this?

Dr Bell—Off the top of my head, no. I believe Canada has just introduced a mandate. Europe has its five per cent mandates. Many of the individual US states have 10 per cent mandates. I believe Thailand has a mandated system, as does Brazil.

Senator JOYCE—So it is not only the OECD countries. But basically, for whatever reason, we are coming—

Senator MILNE—Last.

Dr Bell—Yes.

Senator JOYCE—Even if you think about it for a while, there is not another country that is doing a worse job than us. If this were the Melbourne Cup, we have almost been taken over by the ambulance.

Senator MILNE—That is right. In relation to life cycle analysis for greenhouse gases, oil depletion and greenhouse gas reduction have to go hand in hand. It is no use attacking energy security if you make your greenhouse position worse. There have been two or three different analyses of ethanol, and of course it depends also on what the source of your ethanol is as well. But have you done life cycle analysis using a couple of the feedstocks that you have mentioned—newspapers, for example, or sugar cane?

Dr Bell—Personally, no, but I have read through the papers coming out of the States on similar sorts of ideas. It should be noted that the reason that you can get greenhouse neutral lignocellulosic ethanol is that you can use the lignin part of it as a fuel to do your distillation. That is the key part. If you are using a waste product that you produce already then, no matter what you are doing with it, it has already been produced. So I imagine that it is relatively good in life cycle analyses.

CHAIR—I am particularly interested in how this interrelates with land management. I come from Western Australia, and Western Australia have been trying to get lots of trees in the ground to deal with salinity. I think this seems like a particularly exciting way of using some of those trees. Will your process work with oil mallees, for example? There is the Narrogin plant, which is using oil mallees to produce energy. Would this process be able to use the waste that is coming out of there?

Dr Bell—Of their energy-producing process? I am not sure of what they are doing, but if they are making charcoal—I read through their analysis, and basically they were going to use charcoal as a by-product to sell—no. That would be a gasification type thing, where they produce the gases and they leave the charcoal behind.

CHAIR—I think there is a bit of leaf matter and stuff coming out.

Dr Bell—I would just like to say that everyone treats lignocellulose as the same thing. Everyone says, 'We can make lignocellulose into ethanol,' but in reality it is a feedstock that is going to vary. It is not like corn, which is always going to be roughly the same. The lignocellulose from your newspaper is going to be different from that of pine trees or the mallee ones. And the mallee ones would have a lot of the mallee oils, I imagine, and they may inhibit yeast fermentation. But, again, that is what we are aiming to do—to develop yeast strains that can cope with a whole variety of different substrates. That is what needs to be done. The breakdown of the lignocellulose should be relatively similar between them, but depending on the year, depending on the type of lignocellulose, you are always going to get a different feedstock coming through to your yeast to ferment.

CHAIR—But you could develop the different strains?

Dr Bell—We think so.

Senator MILNE—What is the next step for you?

Dr Bell—We plan to continue the research until we develop our yeast strains and we are developing business plans on how we can commercialise that and make it into a reality.

CHAIR—What do you think the time frame for that is?

Dr Bell—It is very difficult to say. Our view is that oil prices are not coming back down any time soon and the greenhouse issue is not going away any time soon, so we do not see the demand for ethanol decreasing over the longer term, especially with the legislation in the US.

Senator JOYCE—Is there anywhere else in the world where you do see decreasing demand for ethanol? Is there anywhere where you would say ethanol is passe?

Dr Bell—Not that I know of—

Senator MILNE—Except here!

Dr Bell—but I believe in Brazil it is fluctuating.

CHAIR—He means excluding here.

Dr Bell—We have a timetable of about two years to get the yeast strains up, because that is a crucial part for us.

Senator JOYCE—Is there anywhere else in the world that is matching your research? Do we have competition somewhere else out there in the world?

Dr Bell—Absolutely. We are, as far as we know, the only people who have gone down the non-GM route to try and do this.

Senator MILNE—Great.

Dr Bell—Everyone else has used cloning of genes—even elephant poo. There are many different types of genes put in there. As far as we are aware and as far as our patent position goes, we are the only ones who have tried for non-genetic engineering. We have chosen the non-genetic engineering route mainly because we think it is a better route to achieve the goal—that is, we have done it not because we are anti-GMO but simply because, to achieve the global changes in the yeast that are needed, we think you really need to use a breeding type of approach. But, yes, there is a lot of competition.

Senator MILNE—Are there any national research funding opportunities for you—outside ethanol—as far as industry assistance and commercialisation go? What about matching you with, say, Visy, someone who deals with newspapers, a sugar mill or something like that? I am trying to find ways for you to tell us how we could help you so that you do not have to leave the country.

Dr Bell—There is the REDI scheme, the Renewable Energy Development Initiative, but they have not yet announced the new rounds for that. They are not actually accepting submissions for projects. We are obviously keen. I would like to do it here, but the reality is that it is a global problem and wherever it is done the technology will dissipate throughout the world.

Senator MILNE—I am aware of that. The whole world needs it, but it would be great if the whole world could get it from us and we got the benefits from it as well. That is all. I was not criticising the notion of doing it elsewhere. It is just about maximising the benefit to our own economy and the globe as well.

Dr Bell—I should mention that we have done this entirely on our own funding. There was no government money available to do this.

CHAIR—We will take that point on board. We will wrap it up here. I know people have planes to catch. Thank you very much. I think you can tell by people's reactions that they are pretty excited by what you have had to say. It was important for us to hear it. Thank you very much for taking the trouble to put in a submission and to come before us.

Committee adjourned at 4.22 pm