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SELECT COMMITTEE ON FUEL AND ENERGY

Reference: Issues relating to the Fuel and Energy Industry

MONDAY, 22 JUNE 2009

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SENATE SELECT COMMITTEE ON

FUEL AND ENERGY

Monday, 22 June 2009

Members: Senator Cormann *(Chair)*, Senator Hutchins *(Deputy Chair)*, Senators Bushby, Fielding, Fierravanti-Wells, Joyce and McEwen

Senators in attendance: Senator Cormann, Senator Hutchins, Senator McEwen

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

Terms of reference for the inquiry:

a. To inquire into and report on: the impact of higher fuel and energy prices on:
   i. families,
   ii. small business,
   iii. rural and regional Australia,
   iv. grocery prices, and
   v. key industries, including but not limited to tourism and transport;

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

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

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

e. the existing set of federal and state government regulatory powers as they relate to fuel and energy products;

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

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

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

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

j. any related matters.

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Committee met at 8.42 am

CHAIR (Senator Cormann)—I declare open this public hearing of the Senate Select Committee on Fuel and Energy. The Senate has referred to the committee matters associated with fuel and energy, including the price of fuel, regulation and taxation arrangements, and alternative fuels. The committee is due to present its final report to the Senate on 21 October 2009. Today the committee is focusing on energy and fuel security, particularly the terms of reference relating to the existing set of federal and state government regulatory powers as they relate to fuel and energy products, taxation arrangements on fuel and energy products, the role of alternative sources of energy to coal and alternative fuels to petroleum and diesel, and the domestic energy supply and the domestic oil/gas exploration and refinement industry.

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

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

On behalf of the committee, I thank all those who have made submissions and sent representatives here today for their cooperation in this inquiry.

[8.45 am]

COPELAND, Mr Alan, Section Manager, Resources Section, Australian Bureau of Agricultural and Resource Economics

GLEESON, Ms Patricia Anne, Section Manager, Energy Section, Australian Bureau of Agricultural and Resource Economics

GLYDE, Mr Phillip, Executive Director, Australian Bureau of Agricultural and Resource Economics

MELANIE, Ms Jane, General Manager, Resources, Energy and Trade Branch, Australian Bureau of Agricultural and Resource Economics

CHAIR—I welcome Mr Glyde, Ms Melanie, Ms Gleeson and Mr Copeland from the Australian Bureau of Agricultural and Resource Economics. I remind senators that the Senate has resolved that an officer of a department of the Commonwealth or of a state shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of them to superior officers or to a minister. This resolution prohibits only questions asking for opinions on matters of policy and does not preclude questions asking for explanations of policies or factual questions about when and how policies were adopted.

Officers of the department are also reminded that any claim that it would be contrary to the public interest to answer a question must be made by a minister and should be accompanied by a statement setting out the basis for the claim. I particularly draw the attention of officers to an order of the Senate of 13 May 2009 specifying the process by which a claim of public interest immunity should be raised.

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

Mr Glyde—We were not planning to make much of a statement. We simply wish to say that in October last year we provided essentially a descriptive and factual submission describing the domestic oil and gas industry on the exploration and refining side. We have also included some information about the share that both fuel and fertiliser costs have on the farm sector, together with a listing of major development projects. Since we provided that submission in October, we have updated the major development projects work twice and tomorrow we will release our June quarter Australian commodities bulletin, which will also further update the information that was in that submission. So, with your agreement, we will provide the committee with an updated version of the submission, because some of the data in here is now almost six months old.

CHAIR—Perhaps you can talk us through the major issues for Australia, as you see them, in terms of energy security.

Mr Glyde—Our submission is not focused on energy security at all. We are really just trying to provide some factual information about where the domestic oil and gas exploration refining

industry is located and the share of fuel and fertiliser costs on the farming sector. I could take you through those, if you like. We do not have anything in here at all on energy and fuel security.

CHAIR—Is it something that you assess at all? For example, the impact of the lack of energy on—

Mr Glyde—No, we do not provide any sort of advice in relation to energy security. That really is a matter for the Department of Resources, Energy and Tourism because they have policy carriage of that. Our responsibility is to provide statistics and forecasts about the major energy and mineral commodities.

Senator HUTCHINS—What about energy availability in the future? Do we have some difficulties ahead that you would like to share with us? Are there things that we as policymakers need to be aware of?

CHAIR—Just to clarify: I was not really asking you for a policy position. In your capacity at the Australian government's research agency conducting research and analysis around the agricultural, fishing, forestry, energy and minerals industries I assume you are doing some research and analysis of some energy security issues. I am keen for you to paint the picture for us. You really are our opening witness in terms of this part of the inquiry.

Mr Glyde—I think the best thing we could do is provide you with our energy projections, which we do on an annual basis. Out to 30 years, we do forecasts for oil prices—short, medium and long term. We can run you through those, if that would be useful.

CHAIR—That would be very useful. Also, do you conduct any analysis of how you see supply and demand tracking into the future?

Mr Glyde—Yes.

CHAIR—They are the sorts of things that we would be very keen to talk through.

Mr Glyde—No problems. What we might do is perhaps talk about our long-term energy projections which go out 30 years. That is probably the best timescale to be talking about.

Ms Melanie—As Mr Glyde said, ABARE does a set of long-term energy projections which looks forward over the next 20 years or so. The latest one that we did was in 2007. We are now in the process of putting together another set of energy projections. So we have not done any work since 2007 on these issues. In terms of the analysis underpinning this issue of energy security, I guess we have not looked at it for two years, but there are certain general trends that I can talk about if that is going to be useful.

Certainly, in terms of energy resources, Australia has substantial resources of energy. The issue of energy security is not so much, 'Do we have the resources'. It is really whether these resources can be brought into development and brought to where they are needed. One critical issue in terms of energy security is investment in exploration and development. There are lots of factors, obviously, that affect these expenditures. Probably the main one that is important is prices. If we look at historical trends we can see that exploration expenditure is very strongly

correlated with the prices of energy commodities. We saw a very high increase in exploration expenditure over the past couple of years. What we have also seen over the last few months—as a result of the lower oil prices and commodities prices generally—is a bit of a decline in exploration expenditure. To that extent, the volatility of commodity prices can have a major impact on exploration expenditure.

In terms of oil in particular, we looked at Australia's oil import dependency. At this stage this sits at around 70 per cent; however, the number varies significantly over the years depending on Australia's production of crude oil. We put together the short- and medium-term forecasts for oil production and we are not expecting a lot of change in that profile over the short- to medium-term. But obviously in the long term that will depend a lot on exploration and to what extent discoveries occur with exploration expenditure and to what extent we have access to new fields. As you probably know, a lot of the fields in Australia are maturing so the production is likely to go down in these fields; however, there is potential to find new fields and also to improve the discovery and extraction rates of existing fields.

CHAIR—That is in relation to oil. What about some of the other energy sources?

Ms Melanie—In relation to coal, as I initially pointed out, there are plenty of coal resources in Australia. The main constraint in the short- to medium-term has been infrastructure; however, we know that there has been a lot of investment going on in increasing our capacity to deliver coal not only domestically but also to international markets.

Moving on to gas, again there are substantial gas resources in Australia. The production-to-reserves ratio is very low, so there is a lot of potential to increase our production of natural gas. Whether that happens or not will depend a lot on the economics of that—that is, what prices are doing, particularly on the global markets.

CHAIR—Do you assess the supply and demand for renewables, as well, in the research you do?

Ms Melanie—Not explicitly.

CHAIR—How do you do it if it is not explicitly? What do you do? To what extent do you assess it?

Ms Melanie—What we do is look forward over the next 20 years and assess the share of different types of energy into our fuel mix. For example, we look at what happens to the share of coal over that time; what is likely to happen to the share of different commodities, like gas and oil; and, in that context, what happens to the share of renewables. We also take into account the current policy settings.

CHAIR—Looking at your analysis and looking at your research, where will the pressure points be over the next couple of decades?

Ms Melanie—We are now in the process of putting together the set of long-term energy projections and, since we did the last one two years ago, the policy settings have changed

significantly. So, at this stage, it is a bit difficult to answer that question until we have done that work.

CHAIR—When do you expect to have finalised that work?

Ms Melanie—By the end of this year.

CHAIR—If you could keep the committee informed about how you are going, when you can, that would be fantastic.

Senator HUTCHINS—Ms Melanie, you mentioned exploration, and there has been an increase at some point—particularly in oil, I think you were mentioning—and there has been a bit of decline lately. Do you put that firmly at the price at the moment or do you have other reasons why this might be the case? Are there any barriers that you see, which you could objectively observe for us, that exist when it comes to exploration for oil or any of the other energy and secure fuel stocks in Australia—that is, observations that you can make as an independent, albeit that you are a government body?

Ms Melanie—I can try to answer that question, but then I will let Alan give some further details about that. The work that we do on exploration is purely factual, so we look at the trends and report on those trends without going into a lot of detail about what is driving those trends. Obviously, a key factor that has emerged over the past few months is the downward trend in commodity prices. If you look at the graphs of exploration expenditure in commodity prices, they are very, very strongly linked. We would suggest that the recent decline in commodity prices is a significant part of what we have seen in terms of exploration expenditure.

In terms of going forward, one of the key factors will be the uncertainty surrounding commodity prices, to the extent that it is very difficult to know what oil prices will be doing over the next five or 10 years. That could potentially hinder investment into exploration expenditure across the board.

Mr Copeland—Let me add further to that. What we have seen recently is just the beginning of exploration expenditure coming off. In the second half of 2008, exploration across the country was at record levels. Following falling prices and the lag that is associated with that, and then exploration expenditure starting to coming off, we are just starting to see the first signs of it now. So we are not able to get a clear picture of exactly to what extent exploration expenditure may fall and how quickly it may rebound.

But what I would say in relation to Australian exploration expenditure, particularly for oil, is that the emergence of a drop-off that we have seen is consistent with what is happening around the world. To illustrate that, drilling rigs are a very good indicator of exploration expenditure. A recent survey found that the utilisation of exploration drilling rigs in April 2009 was about 50 per cent of what it was in, say, September 2008. Any fall in oil exploration in Australia would be consistent with trends around the world. That probably gives some indication of the major driver, which would be price.

Senator HUTCHINS—There is a huge political issue in the Liverpool Plains at the moment, as you may be aware. Have you come across any impediments in fuel and energy similar to that public opposition to exploration in the fuel and energy areas?

Mr Copeland—One of the differences, perhaps, between oil and gas and coal is that a lot of the exploration for oil and gas is currently taking place off the coast of Australia. So there may be different sets of issues. Certainly, when you are drilling maybe 100 kilometres off the coast of Australia you do not have the land issues so much. I guess that is one difference. Some of the environmental issues may not be the same if you are just drilling in deep water.

Senator HUTCHINS—But what about exploration on land? I go back to that Liverpool Plains example. Are there any areas that you see this may be occurring publicly at the moment? Is there any public opposition to fuel or energy exploration? We are just trying to get to whether, other than the commodity prices, there are more examples of decline because of public opposition. If we want investment in these industries and the public do not, they have to be told, one way or another, what the price is.

Mr Copeland—The observation that I would make is that the public opposition is probably not at the exploration stage. As I mentioned, it is off the coast, so you do not have those issues—to the extent that the majority of Australia's oil and gas exploration is taking place offshore. I am not aware of significant public opposition to any particular exploration project.

Senator HUTCHINS—Does our tax regime compare favourably with other nations—I am not sure whether you are able to comment on this—concerning exploration? Can you compare what happens in, say, South America or North America with Australia? Are we better at it than they are?

Mr Glyde—We have not done any work that would compare the specifics of the taxation regimes, whether at the exploration stage or at the production stage, between countries. The sort of work we have tended to do really comes back further from that. The work that we have done on resource taxation tends to be based on principles and theory—what are the alternative ways for governments to extract revenue from the exploitation of their resources? But, as far as I am aware, we have not done any work that compares, say, the Australian taxation regime with the US, the Middle East or anything like that.

CHAIR—What are the most efficient taxation regimes? What have you found in the work you have done?

Mr Glyde—I will have to ask Ms Melanie to help us out on that one. Our expert on taxation regimes is not with us today.

Ms Melanie—At a very general level, Australia tends to compare quite well in relation to some of the countries that we have looked at. The countries that we have looked at are mainly in the Asia-Pacific regions—resource rich countries such as Indonesia and the Philippines that have a lot of resources but have not been able to realise the potential of these resources. Certainly we are doing better. However, as Mr Glyde said, we have not done a thorough comparison of tax rates among various regimes. I would add that this issue is being looked at within the tax review. That is going on at the moment.

CHAIR—Understood. But Mr Glyde pointed out that there was some work done at a theoretical level of what the most efficient taxation regimes are et cetera. I guess what we are interested in as a committee is for you to perhaps give us some pointers as to some of the things that you have identified as falling under the category of most efficient taxation regimes.

Ms Melanie—At a very broad theoretical level there are trade-offs between what is the most efficient tax regime and what can actually be implemented in practice. That is the trade-off that most governments face.

CHAIR—You are giving me an opinion now and that is not what I have asked you. I have asked you a very specific question, if you do not mind. In the work that you have done at a theoretical level—and it will be up to policymakers to interpret that—what are the things that you have identified as the most efficient taxation arrangement indicators?

Ms Melanie—In theory the most efficient taxation regime is one which varies in relation to costs and profits; like a profit-based taxation or a resource rent taxation.

CHAIR—Which is what we have got.

Ms Melanie—Yes, and this is the consensus in the literature; however, in practice I guess one of the reasons why it is not widely implemented is the huge amount of data or information that you need to be able to implement that regime effectively.

CHAIR—Have you looked at issues like capital depreciation, flow-through shares schemes and things like that when you have looked at your theoretical assessment of taxation regimes?

Ms Melanie—No, we have not done any work on this, as far as I know.

Senator McEWEN—We have the situation where investment and activity in exploration is reducing, presumably because of the global financial crisis. Has any research been done to estimate, if that downward trend continues, at what point we reach a critical situation where there has been a reduction in the amount of activity that goes on and we will fall short in our resources—given the long lead time from exploration to resources coming on line?

Ms Melanie—We have not looked at this issue.

Senator McEWEN—Do you think it is an issue? Some of these projects take 10 or 20 years to come on line.

Ms Melanie—The key question is at what point in time there will be a rebound in expectations, expenditure and exploration. We have already seen a rebound in commodity prices. How long will it take before investors start putting money back into those industries? That is the question that we have not looked at in detail.

Senator McEWEN—Do you think that rebound point is different for the different kinds of resources? Is there any indication that investment is going to happen more quickly in renewables or oil or gas?

Ms Melanie—We have not looked at that issue in detail. In some industries, essentially the supply response has been to shut down production. In that case it will be easier for them to just reopen production and move on. The industries where there have been substantial production cuts are where we expect the rebound to be faster.

Senator McEWEN—Okay, and that will be in the traditional resource sector—coal and oil?

Ms Melanie—Yes.

Senator McEWEN—Okay. You mentioned that the policy settings have changed since you did your last substantial body of research in 2007. Can you articulate what the policy settings are that have changed?

Ms Melanie—The two main changes are in relation to renewable policy. There is the renewable energy target, which is a new target that is now on the table. There is also a CPRS that is now on the table.

Senator McEWEN—So you have take both of those things into account in all of the research that you do in this field?

Ms Melanie—Primarily in the long-term energy projections.

Mr Glyde—The basic principle we have is that if the government has introduced a policy, or is in the process of introducing a policy, we take that into account. And that is not just the case in looking at Australia's domestic policy but also in looking at international policy. So we have to factor in those implemented policies in our thinking.

We are sort of mixing in between short-term and long-term issues. In some ways, despite the huge impact of the global financial crisis over a 30-year period, this is a relatively small change that we are going through—even though there is a very significant economic impact around the world as a result of the global financial crisis. It is about trying to see through that to look at some of the longer run fundamentals that we are talking about. So, when there are these changes in policy and they are going to be implemented and they are going to have an impact over that period, we have to take those into account.

Senator McEWEN—You will be watching the debate in the Senate with great interest this week, I am sure.

Mr Glyde—Absolutely.

Senator McEWEN—I have a question about the relationship between biofuels and food production. You would be aware of the debate in the community about biofuels using up resources that—in the view of some people—should be used to provide food for people. Does ABARE do any research on the relationship between biofuel production and the availability of food resources?

Mr Glyde—We have not done anything specifically in recent times. We have been watching the work that has been done around the world. Groups like the OECD and IFPRI—the

International Food Policy Research Institute—have been doing some work that looked at the recent spike in soft commodity prices and the impact that has had on global food security. We are keeping that sort of work under review. It is a little difficult to determine the extent to which the spike in commodity prices was due to biofuels policies around the world or the other things that were happening in the world economy at the time. We have not actually done anything uniquely to Australia on that.

Senator McEWEN—What about tracking what is happening in the Australian situation—for example, with growing crops for biofuels or ethanol?

Mr Glyde—Looking backwards, we have examined what the production levels have been for ethanol, biodiesel and biofuels more generally, and looked at how these have changed over time. We have been monitoring that, if you like. But as to what impact that has on food production, we do not have any statistics.

Senator McEWEN—Do you do anything about the production of crops for those purposes and the interaction with the availability of water resources, which I know you also monitor?

Mr Glyde—Only to the extent that there is that demand there for grains, for biofuels. That is factored into our short- and medium-term forecasts for grain production and the like. Other than that, no, we have not done any work in that regard.

Senator McEWEN—Thank you.

Senator HUTCHINS—My question regards grain production. With the number of state governments mandating biofuels, do you know how much has shifted into that area? Is it 10 per cent? Presumably New South Wales says it has to be 10 per cent, so I am assuming that is 10 per cent less corn or sugar or whatever it is.

Mr Glyde—I think there is a mandate in both New South Wales and Queensland, if I am not mistaken, or at least talk of it. I will have to take the specifics of that on notice; I do not have those figures—unless anyone else at the table has those figures in their heads. I cannot recall the specifics of the target for New South Wales or for Queensland, over what time frame it is and how binding that target is. We could probably come back to you on that.

Senator HUTCHINS—Has any research been done by ABARE, or any other similar agencies in the world where there are these mandated targets, into the price of grain going up? Say, biofuels are going for $1.39 a litre and you can probably get more money for them than for, say, corn or sugar. Has any research been done where you can track—because it has been mandated—that the price of that grain has gone up?

Mr Glyde—I would have to take that on notice. I am pretty sure that ABARE have not done any work on that. I am not aware there has been any work around the world on that, but I would need to check.

Senator HUTCHINS—It would be helpful if you could find out how much grain production might be shifting now from food to energy and also whether there has been any effect on the

price. I assume you could get more money for fuel than food. There is 90 per cent or 80 per cent less, so demand and supply are inevitably going to push the price up.

Mr Glyde—Certainly. There was the earlier work I referred to that had been done around the world. There is debate about what the impact of biofuels policies more broadly in the global community is on world grain prices. There is quite a debate about that and different views. It is a very hard thing to nail with any certainty. I am not aware that any stuff has been done in Australia, but we will get back to you on that.

Senator HUTCHINS—In particular in relation to Senator McEwen's question, can you relate it to water consumption as well.

Mr Glyde—I understand.

CHAIR—Looking at your October 2008 submission to the committee and following up on the questions from Senator McEwen and Senator Hutchins, you mentioned there was an internal review of existing Australian biofuels policies under way, which was expected to be completed by the end of 2008. What were the outcomes of that review?

Mr Glyde—My understanding—and it is subject to comments from others—is that that review has now been taken up in the context of the government energy white paper work.

CHAIR—So it has not been completed?

Mr Glyde—As far as I know, it has not been completed; the work is still ongoing in relation to that.

CHAIR—Did ABARE complete its contribution to that process?

Mr Glyde—We made some contributions to the work, again along the lines in terms of the factual background that has been done by the Department of Resources, Energy and Tourism as a contribution to that work.

CHAIR—Is there anything that you could share with the committee in that context that would provide us with a similar factual background so that we can be as well informed as possible on the detail of this factual background?

Mr Glyde—That would be something I would have to take up with the Department of Resources, Energy and Tourism.

CHAIR—But I am asking in relation to the ABARE factual information.

Mr Glyde—Yes, that is what I am saying. I would have to refresh my memory as to what sort of information we have provided and what part of it falls in the scope of what you are talking about in terms of the basic factual information. In order to produce that I would need to take that on notice to determine exactly what it is that we can split out and provide to you. I take it you are asking for basic factual information and descriptive information in relation to the biofuels industry.

CHAIR—Yes, and the sort of information that you fed initially into the review process on biofuels and now you tell us has now been fed into the broader energy white paper consideration.

Mr Glyde—That is my understanding of the process.

CHAIR—Have you done any assessment of second generation biofuels?

Mr Glyde—We have not done any scientific assessment, if you like. All we tend to note is that the second generation biofuels remain over the horizon as yet and they do provide significant potential if they can be made commercially viable.

CHAIR—Have you got any factual information in relation to that that you are able to share with us? We are on a fact-finding mission.

Mr Glyde—Yes, I understand that. We are probably the least well qualified people to provide any information on the commercial viability of those alternatives. Probably groups like CSIRO and others would be better placed to provide that. We tend to wait until the things have been commercially proven, or at least have an understanding of what their costs are, before we make a contribution to the debate about what role they might play in the future.

CHAIR—Just going back to the research and analysis that you have conducted around energy security—like demand and supply moving forward, your long-term forecasts—there have been two major changes in policy settings that you have mentioned: the CPRS and renewables. They have been on the radar for a long time. You would have done some work to assess the impact they would have in terms of costing of energy supply and the likely impact on the dynamics of demand and supply of energy. Can you talk us through some of the research you have conducted and what it tells you?

Mr Glyde—It might be possible to describe how we have dealt with the existing renewable energy target, because the existing target, rather than the enhanced target, is factored into our projections currently. Is it something you can take us through, Jane?

Ms Melanie—In the previous set of energy projections we looked at the renewable energy target. Obviously, when you put in a target that increases the share of renewable energy in the fuel mix—and we are starting from a very small base—there is a substantial increase in percentage terms but in absolute number terms it does not lead to a major shift in the share of renewables. But that was the previous renewable energy target. We have not considered the impact of the new target.

CHAIR—You have not considered it, even in terms of providing input to government as they finalise their policy?

Ms Melanie—No.

CHAIR—Your objective is to:

… contribute to the competitiveness of Australia's agricultural, fishing, forestry, energy and minerals industries …

Energy costs are a pretty major factor in terms of the competitiveness of these industries.

Mr Glyde—That is a good point, Senator. The practice that both we as forecasters and other forecasters follow in our energy projections, which we produce on a regular basis and have done for many years, is we take legislated policies and changes rather than what is mooted. There is a lot of discussion right around the world on, for example, the CPRS or emissions trading schemes and various scenarios are possible, but what we have done in the energy projections work is say at a set point in time: 'Has the policy been introduced? Has it been legislated?' If it has been legislated and introduced then it is included in the work. As you know, sometimes governments have the intention to introduce things but cannot for a variety of reasons or indeed the government's policy might change. That is the practice. We tend to in terms of our published work draw on the things that have actually been introduced because we can be confident—

CHAIR—That is in terms of your published work, but of course at Senate committee inquiries we can ask questions about the unpublished work. What sort of unpublished work have you done in relation to forecasts in terms of energy supply and demand, costs and impact on competitiveness?

Mr Glyde—The only work that we have done, and it is not necessarily in this context, is the contribution that ABARE made to the Treasury's modelling in relation to the impacts of the introduction of an emissions trading scheme on the Australian economy and indeed on the global economy. We have a macroeconomic model of the world economy that we have used in the past for agricultural trade work and for work on the impacts of climate change on economies. We have looked at it from that context but that is very broad brush—

CHAIR—So what does it show you 'very broad brush'?

Mr Glyde—In terms of the introduction of an emissions trading scheme?

CHAIR—And whatever else you have modelled—the enhanced renewable energy target.

Mr Glyde—That is a rather complex question to answer in terms of the details in terms of energy share. You are really interested in things like: what would be the relative share of various fuel sources?

CHAIR—The committee right now is in a broader sense interested in what needs to be done to ensure that we have an affordable, reliable, secure supply of energy in an environmentally friendly fashion. I am going to: how is it going to impact on the security of supply, how is it going to impact on affordability and how is it going to impact on the environment?

Mr Glyde—Prior to the work that the Treasury has done, over the last half a dozen years we have modelled a number of different global climate change scenarios and global action in relation to climate change—this certainly precedes the work that the Australian government has done on the ETS—and looked at what happens to the relative shares of energy under those different scenarios. I am more than happy to provide you with that information, but I do not have that in my head and there are a large amount of different outcomes that flow from the different assumptions you make about what is going to be the impact of climate change and also the variety of global responses that might be made to climate change.

CHAIR—I was not asking you about the impact of climate change. We were talking very specifically about two policy changes that are being pursued by the current government and their impact on a reliable, affordable, secure supply of energy. You said your published work does not include the impact of any of that, so whatever you are currently publicly releasing is based on the previous policy settings because the legislation has not been passed by parliament yet. You have said that you have done some work internally. I am interested in the work that you have done internally. The share of energy is one thing but I am looking at cost and security of supply.

Mr Glyde—I will distinguish the nature of the work we have done. Some of the work we do is energy projections out 20 or 30 years. That is one part of the work which Ms Melanie's branch deals with. Another piece of work that we do is related to looking at the question of climate change and it relies on the global general equilibrium model, which is what I was referring to when I said I could give you some information about how the shares of oil, gas, nuclear and renewables et cetera change with different scenarios about climate change. So if you are talking about long-run energy security issues, that work is also relevant and I am saying that I have not brought any of that with me and would need to provide you with the references on that so you could be across that work. That would still give you some useful information on energy shares and how they might change under different policy responses.

CHAIR—That would very good information indeed. Shares are one thing, but as a committee we are particularly interested in whether there is going to be enough energy to go around to ensure that we have competitive Australian agriculture, fishing, forestry, energy and minerals industries. On the basis of the analysis that you have done, are you confident that the energy supplies—whatever the share in the mix is going to be—are going to be sufficient to ensure that all of the industries that you are oversighting will be competitive?

Mr Glyde—The answer to that question is yes. We think there is more than enough energy availability.

CHAIR—To keep it competitive?

Mr Glyde—Yes, for it to be competitive

CHAIR—So where are the relative share points?

Mr Glyde—The relative shares of that are going to change depending not only on the government policies of this country but also on the policies of other governments around the world over the course of the next 20 or 30 years.

CHAIR—Clearly there are good reasons to pursue it, but some energy sources are going to be more expensive than others if more expensive means impact on competitiveness. What sorts of pressure points have you assessed with that affordable and secure energy supply moving forward?

Mr Glyde—I am not sure I understand what you mean by pressure points.

CHAIR—I think that everybody agrees that, while it is desirable from an environmental point of view, renewable energy can be less cost-efficient compared to, say, gas or coal, so presumably

somebody has to carry that cost. If you carry a cost, it makes you less competitive than if you had a more cost-efficient energy source. Are they the sorts of dynamics that you have researched and analysed?

Mr Glyde—I might ask Ms Melanie to run us through exactly what it is we have done on that front. One of the complexities of doing this work and in making judgments about what is going to happen to energy supply and demand over the course of the next 30 years is the assessments you make about the changes and the improvements in technology, and so judgments have to be made about the extent to which we will be able to cost-competitively obtain oil and gas from resources which are deeper and further afield and also whether there are going to be any technological changes for renewables as those industries expand and we research them.

CHAIR—And you have made those judgements?

Mr Glyde—We do not make those judgements as ABARE; we tend to look to the literature and find out what the judgements are that are coming out from the scientific community and the business community about those sorts of costs.

CHAIR—But any forecaster at the end of the day has to make a judgement. You have to make some judgements as forecasters.

Mr Glyde—Yes, that is right. It is easy to make those judgements in some of this general equilibrium modelling where you can make some assumptions, but I might ask Jane or Alan—

CHAIR—Maybe you could take it on notice because we are running out of time. What sorts of assessments have you done around uranium mining and the potential of uranium and nuclear?

Mr Glyde—We did some work for the Howard government's uranium mining, processing and nuclear energy review in, I think, 2006. We provided some factual information on what the potential was there. I do not have that with me, but I am more than happy to provide that.

CHAIR—Would you say that that information is still by and large current?

Mr Glyde—I would have to test my memory on that one because it was a couple of years ago.

CHAIR—Could you provide us with a copy of that and on notice could you give us an assessment as to whether the information is still current and, if not, where there have been some changes?

Mr Glyde—Yes.

CHAIR—Thank you, everybody, for your contribution today.

[9.33 am]

CARTWRIGHT, Ms Cheryl, Chief Executive, Australian Pipeline Industry Association

DAVIES, Mr Steven, Policy Adviser, Australian Pipeline Industry Association

CHAIR—I welcome Ms Cartwright and Mr Davies from the Australian Pipeline Industry Association. I invite you to make a brief opening statement and then the committee will ask some questions.

Ms Cartwright—APIA would like to make a case for natural gas in Australia. What tends to happen is that natural gas is taken for granted and most of the discussion about gas supply and gas development tends to focus on our exports. I would like to make the point that 40 per cent of Australia's natural gas is actually exported; 60 per cent is used domestically, and when I say 'domestically' I mean for major manufacturing and power supply rather than in the home. Only five to 15 per cent of the domestic natural gas nationally is actually used in the home, and that depends obviously on the state and their supply of natural gas.

As we are looking to the future to ensure our supply of energy we are looking at climate change policies, which do not necessarily favour natural gas. It is always assumed that natural gas will be available and that natural gas will step in and take the place of coal at some stage as the price of emissions goes up, but if the system is corrupted then it is going to be a slower transition to natural gas. Obviously, renewable energy is the energy for the future, but in the meantime forcing energy producers to have 20 per cent of their power from renewable sources will increase the costs of the other 80 per cent which will then forced them to go to the lowest possible power source for the other 80 per cent. Again, it discourages the move towards natural gas. Of course, gas is going to be in the mix and more power generation is being provided by natural gas.

We need to keep in mind also that the gas industry does not seek government assistance, but it does face an regulatory regime that does not actually understand the business of transporting gas. It is a general frustration we have. We have a new national gas law in place, which is not too bad—it could have been a lot worse. I have to say that our dealings with the government on that have been very good. The energy regulation is being run by entities that are focused mainly on electricity and there is an increasing determination to impose the type of regulatory policy that works for electricity on natural gas. There are some obvious differences between the two. The way that the system works does not actually stop investment in natural gas transportation, but it makes it more difficult to do the job.

One of the reasons the regulatory regime does not suit gas transmission is it is regulating the four energy sectors—gas transmission; gas distribution, which is at the consumer end; electricity transmission; and electricity distribution. Those four sectors are all being regulated by the same entity. Three of the sectors are highly regulated and work well under the regulated system. Gas transmission is generally not highly regulated. What happens with new developments for gas transmission? We are looking at a transportation company, like a trucking company, moving a product. When these gas transmission companies are building new infrastructure they do not

build for extra capacity for fear of being regulated. So you get a gas transmission pipeline built to meet a particular capacity to meet a particular contract. When the demand goes up they have to increase the amount of gas being shipped. That is done either by compression, which can be done to a certain extent, or by looping the pipeline, which is effectively building a twin pipeline next to the existing one. There are much greater costs. Eventually that greater cost is passed on because to build that extra capacity they then write another contract to get that built. It is not an efficient way of investing in the transportation of our energy.

The other difficulty that the transportation companies have is the Carbon Pollution Reduction Scheme does not allow for pass through of the increased costs for carbon emissions. Some of these big transportation companies use a fair amount of power to compress the gas over long distances with very full large diameter pipes. They trip over into having very high carbon emission costs. The contracts that most of them operate under are very long term and have not allowed for the introduction of the CPRS. They have allowed for the introduction of government taxes in general contracts, but certainly not for a CPRS. So if it goes through these transmission companies will have to absorb those costs rather than pass them through, which basically defeats the purpose of the CPRS, which is supposed to pass the costs through anyway.

It is also difficult for the transmission companies which tend to be shipping the gas for companies that are actually much bigger than they are. While the regulator or the CPRS might be concerned about the companies down the line or the cost to consumers, most of the companies that purchase the gas or ship the gas are actually larger than the companies doing the shipping, so there is a disadvantage there as well. I would just hope that there is an increased focus on natural gas in the sense of understanding some of the challenges of actually meeting the future demand.

CHAIR—Thank you very much for that, Ms Cartwright. Can I make sure that I have understood your comments correctly. Are you saying that because the economy is forced into more expensive renewable energies with the 20 per cent target there is then a dash for the cheapest alternative for the other 80 per cent, which disadvantages gas, which by and large would be more environmentally friendly than some of the others. Is that what you are saying?

Ms Cartwright—Gas is the most environmentally friendly fossil fuel. Your understanding of the comment is right. Obviously for that other 80 per cent it would depend on the price of the CO2 emissions as to how expensive it would be to go to gas or stick with coal.

CHAIR—So potentially we could be worse off as a result? From the look on your face you think that might be taking it a step too far, but we are not as well off as we could be if we went harder into gas.

Ms Cartwright—It is a more expensive way of doing it. A renewable energy target basically will increase the overall costs of energy generation. Obviously, to reduce emissions you are going to need to put a cost on emissions, but by doing that as well as a renewable target it is a much higher cost. We would contend that eventually the technology will come into play to the point where renewable energy will be part of mainstream power generation. But if there was no renewable energy target and just the Carbon Pollution Reduction Scheme there would be a much greater increased move to gas.

CHAIR—And we have still got significant gas reserves out there.

Ms Cartwright—A hundred years.

CHAIR—To offset the increased cost of the renewable energy target, there is an incentive for people to go for the cheaper but more polluting energy sources for the other 80 per cent—that is essentially the point you made?

Ms Cartwright—That is the point that we would make. We do not represent that sector of the energy market, but that is an assumption that we would make.

CHAIR—You have identified a few of the issues you are facing from a regulatory point of view. What would be the ideal regulatory environment from your industry's point of view?

Ms Cartwright—As I mentioned, the gas transmission sector was privatised many years ago, but there is a tendency to increase regulation by default. Every step of the way there is a new requirement for information or extra work to be done to provide information to the regulator. In a purely privately run business there is competition out there and you would not expect there to be a need for that. But we now have a national energy market operator which is basing the way it runs the gas market on the Victoria market, which is quite different from the rest of Australia. Victoria is small; the gas market there has a lot of inputs and outputs. In the rest of Australia it is point-to-point long-term contracts and it is all managed through private investment.

Those transmission pipelines that are not regulated will do whatever they can not to be, which means inefficient investment. The ones that are regulated are looking at the lowest return possible—which is the attitude of the regulator—because the regulator is generally protecting the consumers from high costs. The regulator will impose that philosophy onto the transmission pipelines and provide as low as possible a return on that investment. The difficulty with that is that if it keeps going as low as it is, there is less enthusiasm for the private sector to invest and develop new pipelines or even expand the ones they have got. It is also an unfair advantage to those larger companies. It is not the consumers at the end of the transmission pipeline—it is large retailers, manufacturers and distribution companies. It is an unfair disadvantage to the transmission pipeline companies.

CHAIR—So if you are to make an improvement to the regulatory framework how would you fix it?

Ms Cartwright—We are trying to get the regulator to understand that in our case the lowest possible return on investment is not a good way to encourage private sector investment. It is a little bit radical but we would like to see a better exchange of information between the regulator, bureaucracy and industry. I think it would be of some benefit as an educational process for young people coming through the bureaucracy to actually have some experience of the private sector so that they have a different attitude to regulation.

CHAIR—What you are describing are more relationship management and attitudinal issues. They do not go to the actual structure of the regulation; they go to the way it is applied by the people who are in those positions. I am just trying to get a sense of whether there is something in

the regulatory structure itself that you think can or should be improved; versus, wanting people who are administering the regulations to have a better attitude.

Ms Cartwright—There is one thing we have talked about but not taken any further—taking gas transmission out of those four sectors in energy regulation and having it regulated under part 3A of the Trade Practices Act. Given that the new gas law has only just come in, it is a little soon to start demonstrating to the government that that is what we need to do.

CHAIR—But what is your thinking about it?

Ms Cartwright—I think as the gas law operates and as the Australian Energy Regulator continues its work—and the new Australian Energy Market Operator, which is only in its infancy—we will see whether it will actually work better then. I think Steve would like to say something, too.

Mr Davies—Firstly, there is no real silver bullet to solve a regulatory issue or a general regulatory approach for an industry. There are two things we would like to see. One is an attitude that exists between regulators, the bureaucracy and industry. Most dialogues are entered into from an adversarial point of view. The regulators rightly or wrongly assume that industry will not always do the right thing; whereas the reality is industry does have a genuine interest in creating competitive markets and expanding those markets so that industries as a whole are better off.

This comes to the point Cheryl made. This adversarial role sees the regulator's point is to ensure that the costs for end users of infrastructure are as low as possible. If you are going to make the costs for end users as low as possible that also means you are making the returns for the investors in the infrastructure as low as acceptable to the investors. Whilst that means they may well hold on to their assets and keep those minimal returns, they are not going to be extremely excited about expanding or investing more than they otherwise would have. You are not going to encourage over-investment in an industry. To ensure energy security we actually do not want the bare minimum of investment in energy infrastructure, we want over-investment in energy infrastructure to ensure that there are multiple sources of energy coming into each of the major markets.

CHAIR—That was your first point and you had a second point.

Mr Davies—The second point is that when dealing with regulators there is a real assumption that because the electricity industry has an instantaneous matching of supply and demand all electricity is fed into a major pool and drawn out of a major pool that is centrally controlled. There is an implicit assumption that that is a far better way of having companies go off and negotiate individual contracts with gas producers and gas transporters. So there is a real, basic assumption within the regulatory environment for the energy industry that the bilateral contract framework for the gas industry is inferior to the electricity industry's more spot market.

CHAIR—Which only applies in the eastern states, incidentally.

Mr Davies—That is true.

CHAIR—The great state of Western Australian is much more in tune with the gas transmission market, isn't it?

Ms Cartwright—Western Australia is different in a lot of ways.

Mr Davies—The isolation of the Western Australian market means that when we are talking about the Australian energy market—

CHAIR—Yes, we talk about the eastern states market.

Mr Davies—That is correct.

Senator HUTCHINS—Do you have figures at hand? You said that 40 per cent of natural gas is exported. You said 60 per cent is used domestically, but of that 60 per cent only between five and 15 per cent is used in the home. Is that consistent in the eastern states or is it more in Victoria than Tasmania?

Ms Cartwright—There is more gas used in Victoria and Western Australia in the home. South Australia is half and half, and in New South Wales it is only about one per cent or two per cent.

Senator HUTCHINS—It might be because they have a lot of coal, I would imagine.

Ms Cartwright—It has a little bit to do with that.

Senator HUTCHINS—In your contribution, Ms Cartwright, you talked about the role of the national energy market regulator and their emphasis on consumers. Is there a difference in price per unit per gas in the various states? Is it higher in Western Australia than it is in Victoria, Tasmania or New South Wales?

Ms Cartwright—From the transmission perspective it is on an individual company and individual contract basis, so that is a commercial-in-confidence issue that they do not even share with us.

Mr Davies—In general the retail price varies from state to state, so the transmission portion is only a small component of that price. You would be surprised that there is no definitive publication that points out the actual retail price of gas in each state. The Victorian price is well understood and well published, but a state-by-state comparison is not that simple to make.

Senator HUTCHINS—Is there competition within states? You said Victoria would use up to 25 per cent and South Australia 50 per cent.

Ms Cartwright—Are you talking about retail or in the transmission?

Senator HUTCHINS—Both.

Ms Cartwright—It is a bit hard to tell with retail because we do not look after that. With transmission there are two main pipelines coming into Adelaide, Sydney and Brisbane, with each

coming from different sources and, with the opening of the coal seam gas fields in Queensland, a new pipeline joining the Roma to Brisbane pipeline to the Adelaide pipeline, so that all of the eastern states are joined and all of the sources of gas can go into those pipelines. But they are private contracts that have responded to that demand. As an example in Australian terms, a small pipeline of 180 kilometres or 200 kilometres joins the Roma to Brisbane pipeline over to Moomba. That was done on contract and built for capacity. By the time it was complete there was an increase in demand and they started looping or building a second pipeline at about the time the first one was completed.

That is fine for the gas transmission company because they will get a new contract, they will build a new pipeline and they keep growing, but in the longer term perhaps it is not the best use of resources. If the first pipeline had been built with extra capacity, without fear of being regulated and an unfair tariff put on the spare capacity, then you only have to dig the ditch once.

Senator HUTCHINS—So now they are digging it again.

Ms Cartwright—Yes, they are doing it again.

Senator McEWEN—Regardless of the regulation that applies, would it not be a commercial decision about the size of the pipeline that they were going to build?

Ms Cartwright—That is the point.

Senator McEWEN—Is there an element there of them not forecasting well enough about future demand?

Ms Cartwright—They know that there is going to be future demand, but if they build extra capacity for demand that has not been met by a contract the regulator is likely to step in and regulate the price of that spare capacity. That would impact on—

Senator McEWEN—Why don't they build that potential factor into the price that they put to the supplier of the gas?

Ms Cartwright—The companies that are shipping the gas are not going to pay that extra cost.

Senator McEWEN—But they could and they could levy either the consumer at that end or the supplier at the other end.

Ms Cartwright—Then they are faced with regulators as well.

Senator HUTCHINS—You have outlined a few concerns, but the main one has been regulation. Does the association have a view about how secure our energy and fuel security is in the foreseeable future? Do you see people not investing in natural gas? We have been told by ABARE that we have plenty of it.

Ms Cartwright—The members of APIA are purely the companies that move it from point A to point B. Some of our members are smaller producers. There is not a lack of investment in natural gas, but there would possibly be more if there were not these restrictions. The big guys at

one end are producing and the big guys at the other end are retailing and the transmission companies and the transmission sector is often forgotten. That is because the infrastructure is buried; it is out of sight, out of mind and incredibly well managed. When you do not see a problem then you tend not to focus on it.

It was a little disheartening to hear one of the officials in the department suggest that the reason there had not been any problems as far as accidents with gas transmission pipelines is purely luck. I tried to explain the amount of work that goes into operation, management and research of the safety and that is an ongoing thing. In fact the APIA members in their research committee have links with international research organisations in North America and Europe and are highly respected there. The industry has actually educated itself to make the country safe.

CHAIR—In terms of the overall issue of energy security you would have heard the questions I asked of ABARE. What are some of the pressure points that you see over the next couple of decades that we need to be conscious of and proactively address?

Ms Cartwright—It is quite possible that, with the assumption that gas will be there when required, if it is not absolutely clear where the investment is going to be in the power generation or even with renewable energy it is not generally a reliable baseload fuel, natural gas would be needed as a backup fuel. If there is not sufficient forecasting or sufficient encouragement for investment then the private sector will not invest but again it is a secure investment climate. There is no way that this industry and this sector is seeking government assistance. The only way that government assistance might be needed is in transportation of CO2 in the carbon capture transportation and storage aspect. That is the only way that you might look at government investment.

CHAIR—You represent an industry that provides a particular energy source. Do you have an overall look at the energy mix at all and how gas fits within it? How do you see that tracking over the next couple of decades?

Ms Cartwright—We expect there will be an increase in demand for gas. We just hope there will be sufficient encouragement to invest in the infrastructure.

CHAIR—You do not think that at present there is enough encouragement in the system essentially. We have talked through a few of the regulatory and attitudinal issues.

Ms Cartwright—There are incremental frustrations with the regulatory process. The companies will protest for a while—

CHAIR—And then get on with it.

Ms Cartwright—and then say, 'Okay, we'll wear the costs,' and get on with business, but it is gradually reducing the return on investment. It is going to be a gradual recognition of a lack availability or a lack of availability of the infrastructure.

CHAIR—So are we currently trending the wrong way?

Mr Davies—I think we are trending the right way in terms of growth in gas but our main concern is not that there is a lack of assistance for the gas industry, particularly in terms of electricity supply, but that there is assistance for every other form of electricity supply.

CHAIR—Which skews the market for you.

Mr Davies—Yes, that is right. We would rather just see a carbon pollution reduction scheme that has a strong signal to send to the economy and then allows the economy to determine the most efficient outcomes rather than their being additional assistance for other electricity sectors.

CHAIR—Which is your argument under renewable energies, and we have been through that.

Mr Davies—Yes.

Senator McEWEN—What exactly do you mean by 'differential assistance'? What is the assistance that the other energy suppliers get?

Mr Davies—The Carbon Pollution Reduction Scheme will be providing free permits to coal fired power stations but not to gas fired power stations. There is a mandate that 20 per cent of your electricity has to come from a renewable source but then there is no mandate that a certain amount has to come from a gas source. I am not saying that we would like that, but it means there are not as many options for electricity suppliers to choose the most economically efficient way of supplying low-emission electricity.

Senator McEWEN—Thank you. I think it is useful to articulate exactly what we are talking about.

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

Proceedings suspended from 10.02 am to 10.26 am

DWYER, Mr Damian Michael, Director, Energy Markets and Climate Change, Australian Petroleum Production and Exploration Association Ltd

McCALLUM, Mr Mark Brian, Deputy Chief Executive, Policy and External Relations, Australian Petroleum Production and Exploration Association Ltd

PARIMALA, Mr Rangaradan, Director, Exploration and Access, Australian Petroleum Production and Exploration Association Ltd

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

Mr McCallum—Thank you for the opportunity to present on our submission today. We appreciate the opportunity to discuss the views of our membership with a view to informing your consideration of key issues impacting fuel and energy sectors in Australia. As you may be aware, APPEA represents companies who account for around 98 per cent of all the oil and gas produced within Australia. APPEA also represents companies servicing our members.

With the key focus for this committee being on the use of petroleum for primary energy consumption, clearly, reliable and competitively priced sources are essential to the continued growth and prosperity of the Australian economy. Until recently Australia has been a net exporter of oil, gas and condensate—that is, the quality and volume of production has surpassed our import requirements. As the ability to produce significant volumes for export has declined, so has our reliance on imported petroleum increased. Our current deficit lies at over $13 billion and is estimated to rise to an annual trade deficit beyond $25 billion per year by 2020. APPEA is strongly committed to redressing the balance of Australia's petroleum production not only in terms of the balance of trade but also in terms of the interests of national energy security.

Petroleum taxation and royalties are an important source of revenue for the Australian federal government and the state governments. Clearly, declines in production of petroleum have impacts on government revenue. Coupled with security of supply, and facing a reliance on imported sources, the importance to Australia of having a functioning petroleum industry is paramount both up and down the supply chain.

However, Australia has two distinct advantages. Firstly, we are relatively underexplored, with around 40 sedimentary basins still to be assessed for petroleum potential. We have vast amounts of discovered known natural gas being our other advantage. These are key factors in attracting, retaining and growing the Australian petroleum industry. With an active exploration sector, more resources of both oil and gas will continue to be found. With the right policy settings, government can encourage the development of those resources both for the export market, as is the case with LNG, and for the domestic market as fuel for gas and automotive use.

I will now talk about the challenges. A number of ongoing and new issues continue to present significant challenges to Australia realising the significant opportunities that a prosperous oil and gas industry would bring. Despite a continuing commitment to investment, the rapidly changing global financial environment has created a challenging operating framework. For the petroleum

exploration and production industry, a combination of weak commodity prices, relatively high exploration costs, a very tight equity market for companies seeking to raise funds and an uncertain outlook presents a difficult environment for the industry. A direct impact will be high levels of uncertainty, pressure on project returns and profitability, with consequential potential negative impacts on both exploration and development budgets. These conditions, combined with the global financial crisis, the final design of an emissions trading scheme and the development of a new national energy policy are all affecting business decisions and driving the rapid development of new policy responses.

In spite of these conditions, Australia's natural gas reserves have the unique potential to significantly reduce global greenhouse gas emissions while delivering billions of dollars in economic wealth and thousands of jobs to Australians when they need them most. With an estimated $197 billion in new Australian oil and gas projects currently under serious consideration, this industry is also unique in that it is on the cusp of a massive expansion phase that will see Australia become a true cleaner energy superpower. It is also perfectly geographically positioned to meet the growing energy demands of the Asia-Pacific region.

In 2012, at the height of the potential construction boom expected from these projects and based on the most recent estimates, 52,000 new jobs will be generated in Australia's oil and gas and construction industries. With the creation of these new jobs and an estimated $10 billion in additional annual government revenue being generated by 2017, the benefits this industry could deliver to Australia are immense. In these unprecedented times it is more important that governments develop policies that recognise the strategic value of Australia's natural gas resources and develop new policies that truly reflect its capacity to contribute right now to a sustainable and cleaner economic future for Australia.

To derive the most we can from our oil and gas energy resource endowments, the challenge before industry and government can be summarised into two actions needed that will see the commercialisation of Australia's significant and already discovered natural gas reserves, with potentially almost 450 trillion cubic feet already identified, and stimulate new exploration in Australia's unexplored and untapped geological provinces for the next new major oilfield. APPEA is focused on these two issues through strategic engagement with all governments and elected representatives on: policies that reflect the importance of natural gas as a cleaner energy source; policies that ensure a domestic greenhouse gas policy response that results in similar production and investment outcomes to those reasonably expected under a global scheme; policies that improve the fiscal framework for gas projects and the incentives for further exploration for new oil projects, particularly in frontier areas; and, finally, policies that improve the regulatory regime for the industry across all jurisdictions in Australia.

To conclude, APPEA is committed to informing the policy debate to ensure Australia realises its potential in the petroleum sector. Advocating the growth of the upstream industry has real and positive benefits not only for fuel supply, export earnings, jobs and tax receipts but also for assisting the government to meet its obligations with respect to climate change and greenhouse gas imperatives. APPEA has recommended through our submission before you key reforms in areas of taxation, regulation, skills and environment. Addressing these will send the right message to investors and developers alike and set in train an investment in new projects on a scale which I doubt this country has ever seen. This investment will bring thousands of jobs and billions of dollars in government revenues and potentially avoid a further 180 million tonnes of

greenhouse gases entering the planet's atmosphere every year, year on year. Senators, we ask you to consider the issues and solutions proposed in our submission and we are willing to respond to questions.

CHAIR—Thank you very much, Mr McCallum. In your early opening remarks you were focusing on our trade balance, the export potential et cetera. This part of the inquiry is very much looking at our domestic energy security and how we can ensure that we have an affordable, reliable and secure supply of energy in the most environmentally friendly way possible. I wonder if you could give us an assessment of how the industries you represent will be able to contribute to that moving forward and what the pressure points are from a regulatory or other point of view that would need to be addressed.

Mr McCallum—Domestically for us the challenges are commercialising the large gas resources that we have already discovered, while on the liquid fuels front the challenge for us is to find a new oil province. Australia has, as I said in my opening remarks, 40 petroleum provinces that have not been assessed for prospectivity. That in itself presents a significant opportunity for this industry under the right encouragement to invest in new exploration. While we are spending far more in exploration around Australia currently—I think last year we spent over $3 billion in exploration—we are not exploring any more than we otherwise have been. Exploration has largely been quite stagnant. These exploration investments merely reflect the increased costs of exploration going on in Australia at the moment.

CHAIR—When you said 'under the right encouragement' what were you talking about in particular?

Mr McCallum—This industry, unlike many other industries, is not asking for government handouts. We are not and have not approached Invest Australia to build new pipelines, new rail lines or gas plants for us. That is the business of the business. If we need new pipelines, we build them. If we need new gas plants, we build them. If we need new infrastructure, we build it.

From our perspective the biggest issue confronting the commercialisation of gas projects is depreciation. There is a need for accelerated depreciation. Our submission shows that in some countries you may depreciate your capital assets over three to five years—that is in Nigeria, Qatar, Malaysia and the like, which are our primary competitors—while in Australia we are able to depreciate our large $20 billion capital investments only over a lifetime of 12 years. That is merely accelerating the depreciation rate and is not asking the taxpayer for a handout and an assistance package. That is merely making the Australian fiscal environment and taxation arrangements globally competitive.

At the end of the day the project itself will return largely the same amount of money to the Australian taxpayer and the Australian people; it is just a matter of the upfront costs being more palatable for investments of the size we are talking about, which for the Pluto project is approximately $12 billion, for the yet to be announced and yet to be decided on Inpex project going to Darwin is approximately $20 billion and for the yet to be announced and yet to be decided on Gorgon project is in the order of $30 billion to $50 billion.

CHAIR—Can you just talk us through the whole concept of accelerated depreciation and how it interacts with the petroleum resource rent tax arrangements.

Mr McCallum—On page 19 of our submission you will see paragraph 2.5.3 talks about the changes that will make the biggest difference. It is a case study LNG plant. That talks about the base case, the net present value of the project and what depreciation over five years and depreciation over 10 years would result in. From our perspective it does not actually change the return of taxation to the Australian people. Merely the interaction of the taxes is different and the upfront taxation treatment for the industry is different. These projects are designed for 30, 50 or even more years. This is talking about the first three to 12 years of the taxation treatment and compares the two. So, over the life of the project, which is 30 to 50 years, these impacts are negligible on the return to the Australian taxpayer.

CHAIR—When you make those arguments to government, as I am sure you have done over a number of years, what response do you get from government?

Mr McCallum—Some rule it out outright; some listen attentively. At the moment I think it is fair to say governments are listening attentively to the arguments of the industry.

CHAIR—In the context of the Henry taxation—

Mr McCallum—In the context of the Henry review and Minister Ferguson's energy white paper discussions that we have been having with the minister and the department, I think it is fair to say that the industry has been getting a fair hearing on this issue, and governments and elected representatives are listening attentively to the industry. The gas that we have discovered in this country has been discovered recently, all the way up to 20 or 30 years ago, yet in this country we still only have the North West Shelf Venture, the Darwin LNG project operated by ConocoPhillips and the soon-to-be-completed Pluto project. Yet we have another 18 or so projects that are currently under consideration; none of those projects have been green-lighted. It is a balance of all these considerations—fiscal and regulatory—and other opportunities for investment that is driving the fact that we are yet to see the potential green-lighting of 18 new projects in this country.

CHAIR—Let me rephrase the question. Given that the return to the taxpayer over the life of the project is the same, what are the hesitations for government? What has government been telling you? What have they been asking you questions about? What are they seeking reassurance about? What are some of the things?

Mr McCallum—I think that at the moment governments are acting as willing participants in the process. I would not like to pre-empt what Martin Ferguson's review will result in.

CHAIR—No, I am not asking you for that either. What I am asking you is: what are some of the answers that you give to some of the queries that are presented to you? Clearly it has not been a straightforward proposition over a number of years now, and the reason is that there are some concerns, obviously. I want to give you an opportunity to put on the record (1) the concern and (2) your response to it.

Mr McCallum—Yes. Our understanding is that for a number of years the government has been considering a wholesale review of its taxation system, and that has been embarked upon through the Henry tax review. The industry has been given assurances that these issues, among other fiscal issues in our submission, would be addressed and considered through that process.

Senator McEWEN—Following on from Senator Cormann's question, surely that was not the only issue. In the previous government there was not the Henry review of taxation, so what were the arguments that they were putting forward to rebut your request for favourable consideration for earlier depreciation?

Mr McCallum—We have been discussing this particular issue, as an issue, for over five years now. Until the last couple of years, the industry's arguments on this issue were not unified. We have finally finalised a whole-of-industry position on the issue, so we have been pursuing this issue quite vigorously over the last couple of years. Prior to that there were a range of views coming forward from the interview, and now APPEA has unified its voice behind its membership and pushed for a response from government to our arguments through the Henry tax review and through Minister Ferguson's energy white paper.

Senator McEWEN—So the consolidated approach has probably been driven by the fact that there was a review.

Mr McCallum—Yes. Prior to that I guess it would be fair to say that the industry had a range of views about what would be the top two or three issues that would make the biggest difference. Those have been articulated very well through our strategic leader's report that we produced in cooperation with the former government as well as a number of bureaucracies around the state government and senior leaders of the industry. So until that time it would be fair to say that the views of the industry as to the top three to five challenges facing the industry had not been articulated as a consistent grouping.

Senator McEWEN—You mentioned state governments. Have they lent their support to your lobbying of the federal government, if you like, or your input into federal government policy processes to address this issue?

Mr McCallum—Prior to the coal seam gas fields of Queensland being found, the vast majority—90 per cent—of Australia's oil and gas resources were actually located in offshore petroleum provinces in Commonwealth waters. There is the Productivity Commission review and the review initiated by the Council of Australian Governments into the regulatory burden of the oil and gas industry. The Productivity Commission examined all the regulations potentially creating a burden on the industry. Through that process the Productivity Commission, in consultation with industry, the state governments and the Commonwealth government, identified that it should be possible to halve the amount of time that it takes to approve an oil and gas project. That would result in several billion dollars of additional value on these projects being realised by the Australian people.

To reform these regulations will result in halving the length of time it takes to get these projects up and running; and it will significantly add to the value of these projects in terms of earlier taxation receipts, earlier benefits and earlier jobs for the Australian people. This is a long answer. The states have also been undertaking their own reviews. As APPEA, we are yet to see red pen brought to bear on legislation. We are yet to see governments make a response to the Productivity Commission review. That is often the hardest part of these reviews. Everyone thinks that red tape reform is a sensible proposition. The hardest thing is to actually pull out the red pen and say which statutes are actually duplicative; and which administrative structures are deficient

in their efficiency and administration of the public assurance role that the community expects will be applied to the oil and gas industry.

The states and the Commonwealth have a report before them. The challenge before them is to work the industry in refining the regulations before the industry. The benefits are well articulated by the Productivity Commission and it is now before governments to make decisions as to what areas of duplication they would agree with in terms of the Productivity Commission. There are significant benefits here not only for the regulators because they will have a far decreased pressure because they are not administering highly duplicative processes but also for the industry in not having to provide highly duplicative pieces of paper for governments to assess.

CHAIR—Just on that, there was a concurrent review that was supposed to be done. What happened with that?

Mr McCallum—There was. The final report has only just been released by the Productivity Commission. It was a 12-month review of the process. My understanding is that it has been reported to the Ministerial Council on Mineral and Petroleum Resources and they are currently assessing a response from government to the report. That aside, that is one report and at the moment in WA alone I think the WA government is looking at something like three or four separate regulatory reviews. Queensland has two or three regulatory reviews going on at the moment at the same time and South Australia has one.

While we might be able to fix administratively this cross-jurisdictional approval process for 90 per cent of our oil and gas activities—which is very important to the industry—the states also need to get their own house in order. That is critical for the industry because we need to bring these resources somewhere and it is going to be, by and large, into state jurisdiction. It is of critical importance to the industry to have those processes also reviewed, streamlined and addressed. The report of the PC does not just fall at the feet of Minister Ferguson and the Commonwealth government. This report falls at the feet of every minister around Australia regulating the oil and gas industry.

Senator McEWEN—You mentioned the 18 projects that are on line and then you also mentioned that if they were brought on line quicker there would be more jobs and more receipts and stuff. Have you done any analysis of how much more quickly things could be brought on line? I am particularly thinking about jobs in the sector, given the global financial crisis and the loss of jobs in the sector.

Mr McCallum—If you address the issues of capital depreciation, so make Australia that much more attractive. If you have got one cheque for $20 billion and you can choose to spend that cheque in Qatar, Nigeria, Malaysia or Australia, except that cheque for $20 billion gets depreciated over three years in Nigeria and 12 years in Australia. We need to make Australia more competitive to make sure that the cheque for $20 billion is laid down in this country so that we get those jobs here. It is a balance of getting a competitive fiscal framework in Australia but also an improved regulatory regime. The PC has identified that, instead of the five to 10 years it can take a project to get approved in this project—currently some of our major LNG projects have hurdles of 500 decision points from over 20 different regulators—the PC has said that that could easily be halved. The PC has said that the duration of getting approval could be halved quite easily, that it would not be a challenge for Australian regulators to halve the length of time

it takes. So you would be able to speed up the actual turning of sods of soil and creating jobs for Australians in half the time that it currently takes. As I said, some of these projects are typically taking five to 10 years to go from exploration to actual development and first production. They can take much longer.

Senator McEWEN—What would happen if there was nirvana—

Mr McCallum—Utopia?

Senator McEWEN—and regulatory and tax problems disappeared and all of those projects came on line at the same time? Surely that would not be good for the industry either because the price would go down.

Mr McCallum—For the industry I think we are viewing that the demand for energy will increase by 40 per cent over the next couple of decades. We are not in the business necessarily of turning off coal-fired power stations nor are we in the business of reducing Australia's coal exports. Nor are we in the business of trying to do out of business Australia's renewable energy industry. What we are in the business of is making sure that Australia has a competitively priced source of gas in this country as well as in the Asia-Pacific region so that they have development options and development choices in that country. We are in the business of trying to make sure that, instead of China building a thousand coal-fired power stations in the next 10 years, they start building gas-fired power stations and start using our gas, which has significant greenhouse gas benefits. If you look at the CCS arguments carbon capture and storage arguments, on retrofitting an existing coal-fired power station with CCS technology, if you built a natural gas power station today you would get 80 per cent of the CCS coal-fired power station reductions building that gas-fired power station today, so you are 80 per cent of the way there already in terms of retrofitting CCS on coal-fired power stations.

CHAIR—But of course the two major policy initiatives that are currently before the parliament, CPRS and renewable energy targets, make it harder for natural gas to play the role it could play in terms of reducing global greenhouse gas emissions and contributing to our energy security moving forward.

Mr McCallum—I think they are a challenge for us most definitely. We have presented before to this committee about the challenges of the CPRS or the ETS. We have presented on the public record many times our views that an Australian ETS should reflect what would be naturally expected under a global ETS, in that under a global emissions trading scheme with a global price on carbon the Australian gas industry should prosper, should thrive. As it is currently designed, we are not sure that that will be the case; there will be costs in Australia that our competitors do not bear and our customer nations might not reflect in the options that they choose in terms of they may still continue to choose those thousand coal power stations in China over the next 10 years rather than choosing a thousand gas-fired power stations, therefore leaving a legacy of another 40 or 50 years of coal-fired power stations in China that otherwise might have been using Australian gas, creating Australian jobs and creating Australian taxation royalties for the Australian people in addition to the $8 billion in taxation royalty already paid by the Australian oil and gas industry. So, yes, the ETS we would like to see designed should reflect what would be expected under a global scheme and we would like to think that governments and our elected representatives are working to try and make sure that we are able to deliver jobs for Australia, to

deliver taxation returns for Australia and to deliver 180 million tonnes of otherwise emitted greenhouse gas emissions.

CHAIR—Reduce global greenhouse gas emissions.

Mr McCallum—Avoid. Gas still is a fossil fuel and it still does produce greenhouse gas emissions, but when you use our gas instead of Chinese coal you will avoid 180 million tonnes of greenhouse gas emissions year on year.

CHAIR—So you reduce global greenhouse gas emissions. There is another meeting that some of us have to go to at 11 o'clock, so with your indulgence we might leave it here. Thank you very much for your contribution to the committee.

Proceedings suspended from 10.56 am to 11.33 am

McCANN, Mr Michael, Managing Director, Thinkwell Australia Pty Ltd

Evidence was taken via teleconference—

CHAIR—Good morning. I welcome Mr McCann from Thinkwell Australia via teleconference. I invite you to make a brief opening statement and then the committee will ask you some questions.

Mr McCann—Good morning, senators. Thinkwell Australia is based in Perth and we are consultants in energy and greenhouse. My apologies for not being able to attend your meeting in person; thank you for allowing me to participate via teleconference. I will give you some brief background information just so you understand my areas of expertise. I have been involved in energy efficiency and energy analysis for about 20 years, largely from the point of view of electrical energy, but this has inevitably ended up involving me in the analysis of various enterprises and agency greenhouse emissions profiles over the last 10 years. I became interested in the use of biodiesel in mining, agriculture and transport in the last five years while doing enterprise inventories for several mining companies and looking at the means by which they could reduce the greenhouse intensity of their output. Because in the mining industry the major energy input is primarily diesel, even when that is used to generate electricity onsite, one of the few options for mining companies to reduce the carbon intensity their activities is the use of organic fuels, and then I began to look at who was making organic fuels, biodiesel specifically, in Australia and opportunities to introduce that into the supply lines for mining companies.

I promoted this strongly to several mining companies as an option, and several of them investigated it up to the point where, about 18 months ago, Fortescue Metals intended to buy about five million litres of biodiesel a year, prior to changes in their circumstances. But then the most surprising thing happened. Right at the peak of the boom last year, when we were watching diesel prices here in WA retailing at over $1.80 a litre and commercial buyers paying north of $1.40 a litre, there were biodiesel companies able to produce biodiesel and sell it at a price equivalent to 30 per cent less than that of fossil diesel but unable to effectively deliver it to their customers because of a number of regulatory and taxation barriers which controlled the way that biodiesel could be used and blended into fossil diesel, and where the liability for that lay in terms of what was then able to be done under the fuel tax rebates for commercial uses. Right at that time, right at the peak of the boom, I was also commissioned by one of the biodiesel companies in Western Australia to write a paper for your committee, which is how I was invited here.

So, after reflecting on the terms of reference of your inquiry, the major point I wanted to make was that I saw biodiesel as, firstly, a very effective energy diversification opportunity, thus delivering added energy security to high-energy users particularly. But I also see biodiesel as a tremendous opportunity for Australia. Organic liquid fuels, by their very nature, come from organic processes. There are some attributes of some of the plants and seed stocks for biodiesel that are very well suited to some of the drier and less fertile agricultural regions of Australia, with poorer soils and lower rainfall. I saw that there was a very large opportunity, in my view, to create regional economic activity around the use of sustainable biofuels, and that was the question I posed in my first paper for the Department of Resources, Energy and Tourism in early

2008: is biodiesel going to be a sustainable growth industry for Australia or a growing import? That, in essence, is my thesis, and that is all I have to say for my opening statement.

CHAIR—Thank you very much, Mr McCann. You mentioned regulatory and taxation barriers; can you just go into a little bit more detail on that for us and perhaps give us some pointers on how you think, from the biodiesel industry's point of view, regulatory and taxation arrangements ought to be improved.

Mr McCann—Now, this is an area in which I am actually not well versed. I am an energy consultant; I saw the effects of the regulatory arrangements and I can give you quick summary—however, qualified by this: in the last eight months, while I have been working on other projects, there have been changes to the diesel fuel standard in Australia, and I am not entirely sure as to how that has now changed access to the use of biodiesel blends for commercial consumers.

CHAIR—So your comment a bit earlier about regulatory and taxation barriers—you are qualifying that somewhat now, are you?

Mr McCann—Yes, in the sense that, when I was writing the paper in August 2008, the situation definitely created obstacles to commercial users using blended biodiesel. There were subsequently changes to the diesel fuel standard, and I was not party to those changes. I will explain what I do understand, and indeed it might be an area for further inquiry. Essentially, the use of biodiesel is controlled under the diesel fuel standard. When I was looking at it last year, the maximum biodiesel blend that could be sold was B20, which is 20 per cent biodiesel with 80 per cent mineral diesel. That was the standard devised on the basis of the various densities of biodiesel and diesel in a blend. At that point I could not see any sensible technical reason why large commercial users could not run their own fleets, such as mining trucks, transport fleets or indeed agricultural enterprises, on biodiesel. There was no good technical reason for that limitation to be imposed on commercial users with technical expertise in what their fleets were capable of and what sort of fuel they could use.

There is almost certainly a need for a fuel standard for the sale of biodiesel blends to the public. Recently, as I understand it, there has been an amendment to the act which allows biodiesel B5, which is five per cent biodiesel and 95 per cent mineral diesel, to be sold to the public without labelling. That move is laudable because it allows fuel distributors that are prepared to wholesale and retail a blend to do so up to B5 without labelling.

The real benefits of an active domestic biodiesel industry will flow to commercial users. The liquid fuel of choice for mining, for transport and for agriculture is diesel. People who run diesel fleets know what their machines are capable of. Manufacturers such as Caterpillar actually issue compliance requirements for the use of biodiesel. It is perfectly acceptable to use B100 in a lot of heavy machinery. In effect you could run all of the diesel equipment on a large agricultural enterprise, for instance, on biodiesel. You could run mining fleets on biodiesel, if it was economical to do so compared with the cost of mineral diesel. The price of oil has now changed, but there were points last year when it would have been economic for some enterprises to run entirely on biodiesel.

In general, the treatment of biodiesel in Australia—and this is something that probably deserves closer inquiry—under taxation laws on the one hand, in regard to the fuel excise, and

under fuel standards requirements on the other has resulted in confusion and created obstacles. For instance, even when the limit was B20 last year consumers could not blend biodiesel themselves in their own tank farms. The producer of the biodiesel had to extend their blending licence to the location so that the producer of the biodiesel could certify that a B20 blend created, say, on the tank farm of a large mining enterprise was compliant with the biodiesel standard so that the mining enterprise could then claim the fuel excise rebate. These sorts of arrangements were very ineffective and created obstacles to people to producing their own fuel to standard, the liability residing with the producer to deliver and sell fuel of an appropriate quality to people who wanted to use it.

CHAIR—Do you have any views in relation to the relationship between the production of biofuels and food shortages?

Mr McCann—Certainly. Biofuels in the broad are ethanol and biodiesel. The situation with ethanol I do not really wish to comment on other than to point to distortions in the US market in the form of subsidies which allocate a lot of agricultural resources to the production of corn and maize—a lot of which went into ethanol for petroleum additives, ULP additives, in the US. In regard to biodiesel and the production of palm oil, there were points last year where palm oil was more expensive than fossil diesel feedstocks and as such it simply was not being used for biodiesel production. There are certainly impacts in the last five years that are visible, from the allocation of agricultural resources to the production of feedstocks for biodiesel, but I do not think the link is direct or simple. It is actually complex and dependent of the location of the crop and the region in which it is occurring.

In Australia there is much more impact on food prices from the cost of fossil diesel than there was on the allocation of agricultural resources for production of feedstocks for biodiesel. While, certainly, the allocation of food-producing regions for biofuels needs to be understood and looked at with some concern if it is causing food shortages, I do not believe that it is a simple matter of biodiesel demand causing food shortages. Ethanol production in Brazil, which is well established and has been underway for 20 years, has never caused any food shortages there. That is not to say that it does not need analysis.

Senator McEWEN—Following on from the chair's questions about biodiesel and food I note in your submission that you make a few suggestions about the types of plants that could possibly be grown in Australia that are not food sources. As we know, any kind of introduced plant that is grown in Australia is treated with suspicion with very good reason. Whereabouts are you actually suggesting that these kinds of plants could be grown? Would they be agricultural areas and what are the implications for water?

Mr McCann—One of the three species of tree based seed crops that I identified which are generally regarded as very suitable for feedstocks for biodiesel is *Jatropha curcas*. That is now the most widely planted tree based feedstock for biodiesel around the world and it has been planted throughout huge areas of previously unutilised land in India—I should not say unutilised but not cropped.

Senator McEWEN—Used for what?

Mr McCann—Previously, in the areas that I have seen, probably for grazing. Grazing can continue once the trees are at a certain age so that the leaf mass is above the height of the sheep and goats. *Jatropha curcas* is classified as a weed in Western Australia and the Northern Territory. A very able doctor of soil science previously from CSIRO in Adelaide who is now in Western Australia has said that, if anyone can find *Jatropha curcas* occurring as a weed in Australia, please let him know because he wants to collect the varieties. The classification of that plant as a weed presents an immediate problem. It is uncertain as to why it is a weed as there is no actual infestation of it anywhere. *Pongamia pinnata* is already in a trial in the Northern Territory.

These species are all characterised by having deep taproots, being native to low-rainfall areas and being able to grow in poor soils. As such, they are quite suitable to what is now basically open range grazing in large areas of the Northern Territory. Probably *Pongamia* would also relatively easily adapt to salt laden soils in the older areas of the Western Australian wheat belt, some of Victoria and New South Wales western areas as well.

While I am not a horticulturist or a soil scientist, from looking at where these plants have come from, their natural environment and habit, I believe they present unique opportunities for some study and analysis as to their appropriate integration into an Australian agricultural regime. There absolutely is always good reason to be cautious of introduced plants in Australia, particularly ones that may ultimately be planted in large numbers, but until we look at them very closely we cannot make a determination as to whether they are appropriate and productive.

Senator McEWEN—But by and large they would have to be grown on what is now in Australia grazing land.

Mr McCann—Yes. Some land that is classified as grazing of course has very low rates of utilisation—open range cattle in the Northern Territory, some of the drier areas in Western Australia which carry sheep and the western regions of New South Wales, a lot of which has been taken out of production anyway. *Moringa oleifera*, which apparently is regarded as one of the most useful nutritious trees in the world grows best in dry sandy soil. It tolerates poor soil and is drought resistant. These plants have real potential in my view for agricultural activity in areas where other productive activity is extremely low or reliant on animal husbandry only and no cropping at all.

Senator McEWEN—Do you have any information about the yield of those crops? How many hectares of *Pongamia pinnata* would you have to grow to yield a litre of biodiesel?

Mr McCann—*Pongamia* is in a trial now. There are plantations in the Northern Territory, which were planted by the company that commissioned me to do this paper but which has since gone into administration. The plantation has been passed to a new entity apparently. I do not know about *Pongamia*. An average hectare of *Jatropha*, which is the standard for the most productive tree crop at the moment, would produce 1.6 metric tonnes. That is 1,600 litres of diesel a year from a perennial crop.

Senator McEWEN—Is it 1,600 litres from a hectare?

Mr McCann—From a hectare in an average situation. These numbers are based on what is available in the research.

Senator McEWEN—What sort of energy would be consumed to produce that litre?

Mr McCann—The energy return on energy invested equation for *Jatropha* has been analysed by a number of people and it comes out as the most effective EROEI of all the organic feedstocks other than sugarcane to ethanol. But for diesel, from *Jatropha* you basically get two units of energy out for every unit of energy in at this point.

Senator McEWEN—What is the main energy input? What kind of energy are we talking about—coal fired electricity?

Mr McCann—No, not in an agricultural situation. There is one qualification I want to make about this. My colleagues in agriculture say to me that *Jatropha* as a plant is about where wheat was in prebiblical times—that is, nothing that could not be improved with a good bit of breeding. Right now the work underway between, for instance, a university here in Western Australia and a university in Thailand is to identify the most productive varieties and to breed varieties in which the seeds ripen simultaneously. The natural habit of *Jatropha* is for the seeds to ripen across six months of the year, which makes it not amenable to machine harvesting. These plants are not much differentiated from the wild varieties. At the moment the energy input into *Jatropha* would be the energy estimated to go in to cultivate the fields and to plant the trees, which would be diesel, and to then manage weed and to harvest. Then, of course, there is the crushing of the seed and the screening of the oil. *Jatropha* oil can actually go straight into a diesel engine, but as it is now it is used as a feedstock into a process that refines it further.

Senator McEWEN—Going back to your earlier comments about regulatory reform and the current regulatory restriction on using B100, I think you said—

Mr McCann—Yes, anything above B20.

Senator McEWEN—for commercial use, why do you think that regulatory regime is in place? Is it because government has not addressed the issue or is it because of pressure from the traditional mineral diesel suppliers and manufacturers?

Mr McCann—Thank you for that question! I will not propose any sort of fossil fuel conspiracy, but on any analysis the beneficiaries of the existing regime are traditional suppliers, existing suppliers, of mineral based diesel.

Senator McEWEN—Okay.

Mr McCann—As I saw last year when we had diesel selling at $1.47 a litre to commercial operators and biodiesel was available at $1.05, the people who bear the cost of that imposition are those who run the commercial fleets and have the capital to purchase large quantities of diesel directly from the producer but are restricted, certainly on the occasions I saw late last year, because of the barriers to do with blending and the requirements that they had to meet to claim their fuel excise rebate.

Senator McEWEN—In your view, the fact that that current regulatory regime exists which restricts without taxation more use of plant biodiesel—I have lost my train of thought, I am sorry. It will come back to me.

CHAIR—I have a few quick questions. Firstly, you are an energy consultant, an energy expert?

Mr McCann—Yes.

CHAIR—Do you agree with the proposition that Australia should keep all options on the table and should keep an open mind on all sources of energy that can help us ensure a secure, reliable, affordable energy supply into the future that is environmentally sustainable?

Mr McCann—Yes, Senator Cormann, I would have to support that position. Indeed, where I see an opportunity almost crying out is for very resourceful people and companies and resources and agriculture to diversify their own energy supply and improve their own energy security using their own resources. I wonder why we cannot grasp that opportunity. There is no reason why cooperatives of farmers cannot be producing their own biodiesel for their own use and choosing whether they will take the price for the oils they produce as food grade oils, in the case, for instance, of canola oil; whether they will sell their non-edible oils, if they were growing these tree crops, to another refiner; or whether they refine it themselves and use it in their own practices, in their own businesses, in their own machinery. There is no reason why resourceful mining companies who wished to not be totally dependent on the import of refined diesel products to maintain their operations and reduce their carbon intensity could not go directly into business with farmers cooperatives for the supply of organic diesels in Australia.

The final point on this is that, purely as a structural and social issue, if the supply of food is entirely dependent on a refined imported product—the supply of which is no longer certain in terms of the volumes that we have been used to and the price of which can be extremely volatile, as we have seen recently; and, while the prices for mineral commodities have come down significantly, oil is still extremely expensive compared to four years ago—then as a society we need to consider what the structural risks to our cities and our urban populations are if that supply of fuel is in any way curtailed. We should be considering, not for now but for 10 years from now, because it takes time to establish these industries, what the value would be of even one or two days of our million barrels a day fossil fuel consumption being replaced by biodiesel. At least the capacity would be in place in the regions, from either soybean or *Jatropha* or *Moringa*, such that, if there were an emergency or a disruption to supply, regional communities would have the capacity to continue to do what they do, which is feed the cities.

Australia also has a responsibility in that, on rough estimates from friends of mine who bother to crunch these numbers, we export sufficient food to feed something like 2,400 million people—meats, wheat and grains, and edible oils. There are other people outside of Australia who are also dependent on our ability to continue to supply food, and food production is dependent on surplus energy.

CHAIR—Do you think an open mind on energy sources should also apply to exploring the possibility of nuclear energy?

Mr McCann—Nuclear energy has certainly got a place in the modern world. I would keep an open mind about it to the extent at the moment in Australia that, should the capital being invested in hot rock prospecting and attempts to generate electricity from hot rocks be successful, we will not need to spend capital on nuclear in Australia because we—

CHAIR—But you said earlier that we should keep an open mind—

Mr McCann—Certainly.

CHAIR—so I guess we would have to explore it, wouldn't we?

Mr McCann—We can explore it, and I can do the numbers now. If we started today, if we had a set amount of money—say, if we had $5 billion and we had the however many megawatt hours of electricity we needed to deliver it—nuclear still does not stack up in Australia in terms of pure economics. If you then add a carbon price, it gets a lot better. But still I think the question is open until we see whether deep, dry, hot rock granite masses in the Cooper Basin particularly can be used to produce electricity, because in a sense that is nuclear energy: the heat in that granite is created by nuclear radioactive activity. And it is an almost endless supply if—and this is still open to question—any of those geothermal energy companies can actually produce electricity. Geodynamics are very close. They have had some problems, but I suspect they will be able to do it.

CHAIR—Okay. Second generation biofuels—what are your views on those?

Mr McCann—Micro-algae has extremely good prospects. Dr Peer Schenk, a very able doctor of biochemistry at the University of Queensland, is leading the world in identification of micro-algae that produce oil. We should be behind that 100 per cent. There is every possibility that micro-algae could be produced in ponds alongside coal fired power stations and absorb anything between 30 and 50 per cent of the carbon dioxide produced by the combustion of coal and captured in what I refer to as biosequestration—that is, turning it back into organic hydrocarbons. Research and development of micro-algae deserves the full support of the government. Micro-algae also has the potential I understand to be used in saline ponds, which we see being used to divert saltwater in high watertable areas in Western Australia, western Victoria and western New South Wales.

CHAIR—You argue in your submission that the Australian government should commit to the development of a strong biofuel diesel industry. What form do you think the government support should take?

Mr McCann—It is important for the government to remove barriers and allow agricultural centres to produce and use their own biodiesel. Regulation is not my field. I am not a regulatory analyst; I am not that sort of policy analyst. Anything that can assist agricultural enterprises to make their own diesel and become less dependent on imported diesel would have to be a good thing for food security and energy security in Australia. It will create the capacity to rapidly expand the use of biodiesel if there is interruption to the supply of mineral diesel. That means possibly not taxing farmers who produce biodiesel. If farmers can produce diesel and not pay excise on it, how many of them would be producing diesel next year from canola and soy and looking at planting tree crops?

The first step, I think, is getting biodiesel production happening where the feedstocks are created—that is, on the farm. That would be a tremendous asset to Australia in the long term. The second stage would be to give the appropriate research bodies the direction and possibly some funds—they probably already have the funds if they have the direction—to actively assess the tree crops that I have identified and other non-food crops and to develop micro-algae sources for biodiesel for the next stage of having biodiesel become significant in Australia's energy and liquid fuel consumption.

CHAIR—Thank you very much, Mr McCann, for your evidence this morning.

Committee adjourned at 12.08 pm