T R A N S C R I P T

STANDING COMMITTEE ON THE ENVIRONMENT AND PLANNING

Inquiry into unconventional gas in Victoria

Melbourne — 18 August 2015

Members

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Mr John Ginivan (affirmed), Executive Director, Planning and Building Systems,

Mr Lee Miezis (affirmed), Acting Executive Director, Environmental Policy, and

Dr Sharon Davis (affirmed), Executive Director, Water Resources, Department of Environment, Land, Water and Planning; and

Mr Paul McDonald (affirmed), Director, Geological Survey of Victoria,

Mr Ross McGowan (sworn), Executive Director, Earth Resources Regulation Branch,

Mr Mark Feather (affirmed), Executive Director, Energy Sector Development Branch, and

Mr Anthony Hurst (affirmed), Executive Director, Earth Resources Development Branch, Department of Economic Development, Jobs, Transport and Resources.

The CHAIR — I welcome departmental representatives to the inquiry on onshore gas, Anthony Hurst, Mark Feather, Ross McGowan, Paul McDonald, Sharon Davis, Lee Miezis and John Ginivan. Anthony, are you leading the submission? I will ask you to walk us through the departmental submission, and then we will follow up with some questions.

Visual presentation.

Mr HURST — Certainly. Thank you very much for the opportunity to present today on behalf of both the Department of Economic Development, Jobs, Transport and Resources and also the Department of Environment, Land, Water and Planning. I will lead for my department and my colleagues will deal with questions on the DELWP side.

The CHAIR — On that score, who is the lead department on this particular — —

Mr HURST — The Department of Economic Development, Jobs, Transport and Resources.

The CHAIR — Thank you. I just want to be clear about that.

Mr HURST — We do work in partnership, and we work in partnership on the water resource studies in particular and planning aspects. I will briefly talk you through the submission. The purpose of the submission is very much to provide factual information to inform the committee's deliberations with regard to the terms of reference. We do not present any policy position or any opinion about past government or current government policies. This is an opportunity to look at a potential new industry in Victoria, and assess it based on its merits in a very open and transparent way. The task that has been given to the committee in the first instance to look at those facts is a critical one. The fact that it is open and transparent is quite critical, so our role becomes very clear about providing factual information to inform your deliberations.

We identify a range of issues and views arising from the community engagement program, which was conducted last year by the primary agency and then independently reported and published on our website. We can address matters in the submission directly relating to our two departments, matters relating to the Environment Protection Authority's work. I understand they have done a separate submission. We do refer to it in a broad way. Equally the Department of Health and Human Services can deal with public health aspects as well.

There are holds in place that were put in place by the previous government and continued by the current government in terms of exploration activities on the different types of onshore unconventional gas. They will stay in place during the course of the inquiry and pending the government's response on the way forward.

The submission outlines a number of areas relevant to your terms of reference. It is structured to provide information against each of those terms of reference. I will not go through these in great detail, but there is information about the types of gas — tight, shale and unconventional — and also conventional gas is included in there for completeness. The key difference I guess I would highlight is that conventional gas, which is the one people are most familiar with, is the idea of an upturned bathtub where the gas in the geological formation underneath has cooled over time and is simply extracted by putting a drillhole into it and drawing it out under pressure. The unconventional gas types are quite different in that the gas is actually trapped in the geological formation, generally over a much larger distance, and actually getting the gas to migrate to a well is one of the key challenges, hence the debate around hydraulic fracturing. Equally, those resources, if they do in fact exist in Victoria, are generally over a much larger geographical area.

The regulatory framework we outline is the existing regulatory framework, but we have also identified that there are a number of gaps in the existing regulatory framework. If an industry were to proceed in the state, those gaps would need to be identified and addressed. There is a national harmonisation regulatory framework that had been developed through the COAG process a few years ago. It sets out a number of best practice-type approaches that should be embedded into your regulatory framework. It picks up things like well integrity, water monitoring and management, chemical use, hydraulic fracturing and the like.

The petroleum legislation generally aligns with the national framework, but the Mineral Resources (Sustainable Development) Act, which I will abbreviate as MRSDA, does not and would need to be modified to pick up those aspects, because that would be dealing with the coal seam gas aspects. There are also differences around

the requirements for management plans and for community engagement, which would need to be equalised to some degree, and there is probably merit in that in its own right. Both acts provide for issuing licences with the three stages of exploration, retention, and mining and production. I will not go through that in detail unless you require it. Each activity requires a separate licence. Native title must be settled. The licences must be advertised publicly, and feedback must be considered by the regulator in making decisions to issue those licences.

Prior to work commencing, a licence gives you an exclusive right to explore, retain or produce a resource; however, to do any work on that licence you need to get separate approvals, a well operation management plan and the like, wherein conditions can be applied depending on the risks that are identified and what needs to be put in place to deal with those risks. There are also a number of other statutory approvals and referrals that are outlined in the submission. I understand that my DELWP colleagues presented specifically on the water framework at their last hearing appearance, so I will not go into great detail about that. I am sure they are happy to take any questions. A number of other pieces of legislation need to be considered in a number of referrals that go through that process, so it is a pretty rigourous framework at the moment.

There is also the arrangement for the independent expert scientific committee, which has a role under the commonwealth legislation that the states have signed up to on the east coast in terms of any referrals requiring an environment effects statement to be referred to that committee for advice. Then there are EES and planning permits. There is a landholder consent and compensation arrangement, which is quite an important aspect. It certainly comes up in community engagement activities and what the rights are.

The key difference I would probably highlight in terms of unconventional gas is that unlike a discrete mined resource that might be on one property or even possibly a couple of paddocks, where you are dealing with one or maybe a couple of landholders, in the case of unconventional gas, because of the wider geological spread, it brings a lot more landholders into play and therefore a lot more community interest — and fair enough.

Community engagement plans — there are requirements in the MRSDA for that. Rehabilitation plans and bonds — there is legislation before the house at the moment to do with improving transparency in the performance of regulatory work plans and the like. That is in the MRSDA. Then there is an enforcement and compliance regime to underpin that.

The national harmonisation framework I have mentioned. Again, that is about giving some certainty for the community about the various jurisdictions while they go about doing their jobs and equally for the industry some certainty about how they will invest. It reduces some of the overall complexity for landholders.

There are four focus areas, which are quite critical. Well integrity and aquifer protection is quite critical to the safeguards that need to be put in place to extract gas out of the ground. A number of the safeguards, I might just quickly mention, are quite similar to water bores. Effectively you are drilling a bore into the ground through multiple layers, including aquifers, and the integrity of the well is quite essential to it. In the water case you are taking up water; in the case of gas you are taking water and gas. Water management and monitoring naturally flow from that. It is important. Hydraulic fracturing and chemical use — there are different acts there. Conditions can be applied as an interim measure if that is seen fit by the committee as a recommendation and/or in the government's response, but probably you would want to move into a legislative framework in the longer term.

The submission outlines the prospectivity for the different types of onshore gas, essentially where there is a sedimentary basin where materials have been washed off the landscape over time and accumulated with dead plants and animals. Basically that is where you will find potential gas. Whether it is of a commercial scale is unknown. The areas in green at the bottom of the screen in Gippsland and the Otway Basin areas are probably the ones where we have better information about the geological formations of the gas. Areas up around Wangaratta and Numurkah, running down from Murrayville to the south-east towards Hamilton and also up around Cullulleraine on the Murray — a lot less is known but we do believe there are sedimentary structures there. Paul McDonald with the geological survey could provide more information about that, if you require more information. There certainly is not to our knowledge any commercial gas reserves that have been identified at this point in time.

In terms of the environment, land productivity and public health, I will not go into the public health aspects but there are a number of environmental risks. There is a detailed description in the table of a number of risk factors, and potential risk mitigation measures are aired there. Each of those would need to be dealt with. Clearly the

risk to water resources, greenhouse emissions and risk to land productivity are at the forefront of the public's mind, and fair enough.

Water science studies. I will just highlight that this is a first-pass assessment at a regional scale for the Otway and Gippsland basins. They do not go into certain things; some things are out of scope and we need to do the first-pass assessment to identify what the impacts might be, what mitigation measures might need to be put in play, and then what the residual impacts could be, so it is a broad-scale assessment. It looks at four elements — aquifer depressurisation; chemical contamination with hydraulic fracturing; reduced seismicity, so earthquakes and tremors; and land subsidence. The latter is certainly an issue from the public's perspective in parts of Gippsland, particularly down near Seaspray. Then there are a number of out-of-scope issues like physical amenity, fugitive gas emissions, water quality, air quality and a number of other factors, which are listed in the submission.

Without solid baseline data it is difficult to identify the potential impacts on a wider range of environmental aspects, but certainly there are risks there to habitat and biodiversity loss, soil degradation and contamination with greenhouse emissions. Many of those factors are associated with any industrial or other types of land use development, and each of them need to be identified and addressed, as would be normal practice.

Coexistence is obviously critical, as I mentioned before, to landscape-scale activity, and therefore it brings a lot of things into play. It is a Crown-owned resource and legislation requires consent and compensation. There are some quite significant concerns raised in The Primary Agency's report on community engagement. For example, the feedback from dairy farmers. There is an interest in the development of the resource but equally a need to protect the integrity and perception of the product, particularly for baby formula into Asia, which is quite critical. There are potential positive and negative impacts for regional communities. If we look at some of the examples in Queensland, people point to positive aspects, but then other people point to the negatives — town becomes really busy; other people say it is a hive of activity.

There are information asymmetries between landholders and companies. Landholders have a busy day job to do running a dairy farm, grazing or whatever, and companies have more time, I guess, to focus on their specialised area. The information exchange is quite critical. That has certainly come out in Queensland and New South Wales as an area of focus, and we have highlighted that.

Contribution to Victoria's energy mix. My colleague Mark Feather from energy policy can provide more guidance on that if you require, but basically Victoria is self-sufficient — the east coast is self-sufficient until 2030. The potential impact on our energy mix is unknown at this stage, in part because we do not know whether or not there is a commercial resource to extract. The extent that it might displace thermal production from coal-fired power stations is also unknown, and therefore the impact on greenhouse gases is unknown as well.

We have identified a number of knowledge gaps, certainly building on the work we did on prospectivity and water science. We have identified quite a few around there. The fundamental question is: is there commercial gas there? The way to find out traditionally is through commercial exploration. Taxpayers tend not to fund that type of work. The work we do through the Geological Survey of Victoria is focused at regional-scale precompetitive work, which is understanding the broad geological landscape. The understanding of those formations, the characteristics of the coals or the tight formations and the like is generally poorly known. Hydrogeology moving through it, so the groundwater, and the human health and the wider impacts. The actual risks are quite dependent on the circumstances. A lot of that arises from the geological formations.

There has been a lot of work done interstate and elsewhere by previous reviews and the like — the US EPA, the Reith report and the New South Wales chief scientist are well worth a read to learn from those things. I think that might be the end of my slides. As I have indicated at the bottom, it is unclassified because it is all open and keen to inform the discussion.

The CHAIR — I thank you for that submission and for the detailed submission that has come from the departments. I have a number of questions. Some are about work that may or may not have been done, so I want to understand the base of information that we may have to work from. I suppose the prior question is: there were a set of Premier's guidelines put out in 2002 about submissions — and I am just trying to understand the background to this submission — that seek a process to ensure the submission reflects government policy and arrangements. I am presuming that this is prepared pursuant to those guidelines.

Mr HURST — I have not looked at those guidelines. We have prepared it as an interdepartmental submission, so it is not a government submission as such. It is a departmental submission bringing together information to provide factual advice to the committee to inform its work.

The CHAIR — So it is not presented pursuant to those guidelines — —

Mr HURST — I could not confirm whether that is correct or not without looking at the guidelines and the submission, but it is certainly not something that I looked at in putting pen to paper.

The CHAIR — So it has not gone to cabinet is the essential point; it is purely a departmental document.

Mr HURST — The document did go to cabinet.

The CHAIR — Okay, so we might want to see whether it was prepared pursuant to those guidelines. My point on that is that those guidelines seek to harmonise the views of departments, if I can put it fondly. Consequently there are often varied views within different departments, and I certainly would seek to see the initial submissions of the different departments so that I can understand their positions. You can take that on notice. The second point is I just want to understand with respect to the national harmonisation arrangements from COAG, is there a financial incentive involved there? Did the COAG arrangements have some bonus or transfer of resources to the states where they followed with that harmonisation?

Mr HURST — There was an incentive to sign up to the national partnership agreement on major coal mines and coal seam gas, which the state of Victoria did sign up to, and that led to a payment to the state of $10.13 million, which we have used in part to date for the community engagement program and the water science studies.

The CHAIR — Is that funding now exhausted?

Mr HURST — No.

The CHAIR — So there is still additional — and what quantum is still to flow there? Again, take it on notice if you do not — —

Mr HURST — I will have to take it on notice. Myself and Sharon Davis co-chair the project control group looking at the delivery of the water science studies that have just been published. We still have some closing-out exercises to do to finalise all the accounts.

The CHAIR — Another couple of points coming directly out of the submission: it looks in certain spots at landowner consent and compensation arrangements. Has the department or another department in government done any costing of changing those arrangements? Some have talked about vetos and other arrangements and a variety of mechanisms. Has there been any costing done by the department as to what that would mean to the state?

Mr HURST — Not to my knowledge. We did some work under the previous government in the lead-up to that release of an earth resources statement, which was put out late last year, which looked at coming up with more of a commercial consent type approach. It came out of advice from the minister's advisory council on earth resources, but it did not progress further than the development of simple principles.

The CHAIR — Whatever is available there would be very helpful to understand what work has been done or not been done.

Mr HURST — Sure.

The CHAIR — The other point that I was interested in is the gas commissioner, which is referred to in a number of places. Has there been any modelling done in the department or elsewhere in government about a potential use of a gas commissioner of the Queensland type?

Mr HURST — Not in the current term of government, to my knowledge.

The CHAIR — Previously?

Mr HURST — Yes.

The CHAIR — Yes. I would certainly seek, if that information is available, to see some of that made available.

Ms SHING — Thank you, Anthony, for presenting on behalf of everyone who has contributed to the making of this submission and for all the work that has gone on behind the scenes to have this occur. I am interested in the reference that you made to information asymmetries and to the nature — the polarising nature in many instances — of this subject matter in the community insofar as communities that may be directly or indirectly affected, specifically the Gippsland and Otway basins, and how far we have come since other reports on this subject matter have been issued — for example, the Reith report which you referred to and other assessments of those asymmetries and of the community sentiment and general opposition to any introduction of an unconventional sector. I am interested to hear more about the areas of concern that you have outlined at part 5 of the submission and the extent to which that may have changed, softened or indeed become more galvanised since, for example, the issuing of the Reith report.

Mr HURST — On the information asymmetry one, the key thing comes down to skill, if you like, and knowledge. So landholders obviously specialise in the productive use of their land — and I will focus on farming in this case rather than other landholder uses. Being busy every day doing their jobs wells and the like, but when it comes to someone else coming onto their property to do an activity that they have a right to over that property, some property owners are not particularly familiar with that rights structure to start with — the fact that the Crown owns the resource on behalf the community and that someone can enter and do certain works on their property.

There are provisions in the legislation to provide for dispute resolution and compensation in the event that dispute resolution requirements are there, but I guess it is a bit like a tenancy arrangement where the landholder has certain expertise and capabilities and you have tenants with various capabilities as well, and what governments have done in the past is try to equalise that by putting good information out there.

The Victorian Farmers Federation in partnership with the Minerals Council of Australia have developed guidelines that have been working quite well in recent years in order to provide information to both explorers and/or mining companies and also to landholders so that when it comes down to just working out a land access agreement, the type of activities explorers are going to do, when they are going to access, how they are going to treat watering points and opening gates and all that sort of stuff, the landholder knows what it is that they are entitled to ask for and expect to be in an agreement and an explorer is actually up-front and honest about what those requirements are. Good information leads to much better understanding and arrangements.

Ms SHING — Just on that point, we heard evidence in the course of this inquiry from a company that was interested in moving from exploratory drills through to extraction that they were given instructions from a government department not to meet with or engage with the community in a consultative process around drill sites, locations and processes involved from there. Feel free to take this on notice, but are you aware of any department that has issued such instruction or been involved in providing advice to any operator or putative operator about not consulting with communities around these processes?

Mr HURST — Not to my knowledge.

Ms SHING — Okay. If that could be checked and confirmed and provided on notice, that would be very helpful. Thank you.

Mr DALLA-RIVA — Thank you for the presentation again. I am just trying to get some clarity, really following on from the Chair's comments. As you are aware, the terms of reference for the inquiry are fairly lengthy and there are many people on this inquiry who are trying to get an understanding as to the opportunities that may present or the risks or a whole variety of different issues. Your submission is fairly bland in the sense of where it is at — it is very factual — having read through it before. Are you aware of the South Australian inquiry that is underway? The South Australian Parliament has an inquiry on unconventional gas — —

Mr HURST — In broad terms, as we are with what is happening in Queensland and New South Wales, but our focus is very much here.

Mr DALLA-RIVA — On South Australia, you agree that there is an inquiry there — an upper house inquiry?

Mr HURST — My understanding is there is an inquiry of a sort.

Mr DALLA-RIVA — Are you aware of the government's departmental submission?

Mr HURST — No.

Mr DALLA-RIVA — Are you aware that they said, 'Go ahead with it'?

Mr HURST — No.

Mr DALLA-RIVA — Are you aware that in New South Wales there was an inquiry?

Mr HURST — Yes.

Mr DALLA-RIVA — Are you aware of what the government departmental position was?

Mr HURST — In broad terms, yes. It is published.

Mr DALLA-RIVA — And what was that?

Mr HURST — In terms of the strategic resource planning approach, the treatment of existing licences, including some exit arrangements — —

Mr DALLA-RIVA — 'Go ahead'? It was basically, 'Go ahead', in simple terms?

Mr HURST — No, I would not describe it as 'Go ahead' in simple terms. It is almost a resetting. That is probably the way people describe it best — that they are where they are but they want to reset and start again in some places under a different set of arrangements.

Mr DALLA-RIVA — Yes, but 'Start again' is basically 'Continue 'in a different framework.

Mr HURST — Reset and start again.

Mr DALLA-RIVA — Reset; okay.

Mr HURST — Again, I will not try to substantiate or justify the New South Wales position.

Mr DALLA-RIVA — No. Are you aware that there is an inquiry in Western Australia?

Mr HURST — Not in the details, no, but I understand that the Western Australian government is looking at issues around onshore gas. Certainly the Queensland government is as well.

Mr DALLA-RIVA — Are you aware of the government departmental submission to the Western Australian inquiry?

Mr HURST — No, I am focusing very much on Victoria.

Mr DALLA-RIVA — It is just interesting that there are different inquiries in different states. The government departments have set forward a position. You have presented today without a position. It is difficult for us as a committee to form a view if we are not guided by the independence of the department as to where you see it. So I question whether you being here gives us further assistance. Do you have anything to say to that?

Mr HURST — Sure. Both the previous government in Victoria and the current government of Victoria essentially asked us not to do anything that pre-empts a government decision — it is a policy decision which is the domain of the government to make. Our role has been, under the previous government, to conduct or enable the conduct of the community engagement program to get people's views and to conduct the water science studies; under the current government it has been to assist the establishment of the inquiry and also to provide a

submission at this point in time. It has been very much one of informing the decision-makers on how they might go about making a policy decision.

Mr DALLA-RIVA — How do you inform a decision-maker if you are not yourself giving a view either way?

Mr HURST — We have been asked not to move to that stage at this time.

Mr DALLA-RIVA — Who told you that?

Mr HURST — Under the previous government, Minister Northe at the time and prior to him Minister Kotsiras. Under the current government it has been a reaffirmation of the moratorium on gas exploration and the like, and for us to be cautious not to pre-empt any government decisions.

Mr DALLA-RIVA — You have named the previous ministers; who are the current ministers who told you?

Mr HURST — Minister D'Ambrosio. The government's policy is to establish a parliamentary inquiry into unconventional gas, to hear the evidence, to hear from the scientists and to hear from the community in a transparent way. That is the policy position as I understand it. We are not in the position to drive an industry. We are very much under instruction to provide factual information.

Mr DALLA-RIVA — Thank you.

Mr LEANE — That was fun — a conspiracy that leads you back to your government, Richard. You brought up a slide — I think it was in chapter 2 — that started with obtaining a licence and then it stepped through other measures. I do not know if you can bring that up. While you are looking for that, Mr Hurst, in the context of the evidence we have had, some people believe there are competing natures against certain industries as far as there could be a risk to industries such as agriculture or tourism comparative to an onshore gas industry. To start with, the Shaun Leane Gas Company comes to the Victorian government — the department — and I want a licence to explore if the gas is there. What does that cost me? What does that cost my company?

Mr HURST — I might pass to my colleague, Ross McGowan.

Mr McGOWAN — I do not have the figures in front of me, I am afraid.

Mr LEANE — So you will take that on notice?

Mr McGOWAN — On notice, yes.

Mr LEANE — Okay. And you stepped through that once I want to go a step further, to extraction, there are a number of other steps. There are a number of other licences, I understand, that I need to obtain, and a number of other regulations, and in different departments — as in planning and so forth — I need to jump through the hoops, so that obviously will cost me, as Shaun Leane Gas Company, X amount of money. Then as far as royalties to the state government, I find gas and I want to extract it. What does that mean as far as royalties to the state government? I know that you stated that it has not been confirmed that there are any commercial deposits that we know of, so if the answer is 'There are no commercial deposits', does that mean because there is no extraction there are zero royalties? Is it as simple as that?

Mr McGOWAN — Yes.

Mr LEANE — Okay. If you want to take that all on notice so we can have a good understanding of what that actually means in dollar terms comparative to what other industries are supplying to the state government and adding to the whole economy.

Ms BATH — Thank you, lady and gentlemen, for your submission today. As I have been listening over the course of the last few weeks and months on this inquiry, we are interested in the facts — we have been delving into them and your submission is chock-a-block packed full of them. I guess we are also very keen to understand, or I am, what is happening under the earth, so what is happening in terms of our aquifers, the geology, the hydrology and whether there are seams of coal seam, tight and shale. Probably about six weeks ago there was seismic testing along the roads of Gippsland; as I drove along it was evident that that was happening.

I am interested to know what the results were from that, what it can tell us about the facts about what is happening under the ground and so forth.

Mr HURST — Thank you for that. I might pass to Paul McDonald, the director of geological survey to answer that, if that is all right.

Mr McDONALD — Thanks for the question. The Geological Survey of Victoria's job is to understand the geology of Victoria. When we were looking at this, the Gippsland and Otway basins in particular, for the water science studies, there are areas in the Gippsland Basin where there has been little previous exploration, so there was little data we could draw on to help us with the studies. That was particularly evident around what we call South Gippsland — around Leongatha, Mirboo North and down to Inverloch — where we just had very little exploration data in the form of drill holes and very little exploration data in the form of geophysics, like seismic surveys. We did not even have the basis for the gross structure of the geology — what geological units are there, how deep they are, if they are fault-bounded — basically no fundamental geological knowledge.

Part of Geological Survey of Victoria's work is to obtain that fundamental geological knowledge from which we can then build an understanding of how that part of the world was put together. In other parts of the Gippsland Basin there had been previous exploration in the forms of good-quality seismic and good-quality drill holes, which actually gave us some information about the subsurface. Equally in the Otway Basin there has been a period over decades of onshore activity when it comes to exploration, so we did have a good dataset to draw from. That is definitely why we concentrated both on the Otway and Gippsland basins and did not concentrate on the Murray Basin, which was further north.

Ms BATH — I guess I am looking for what you have found. What are the results?

Mr McDONALD — So far the fieldwork of the seismic survey has been completed, and that data is currently being assembled and the tender is going out shortly to the market to process that information. We have acquired the data to both reflect deep geological structures, which is trying to work out the gross structure of the basin, as well as shallow information — when I say shallow, I mean the top 1 kilometre — to help us understand more about the geological layers that might host and do host the aquifers. So we have put that tender out to the market. It is underway already and it soon will be with our partners at Geoscience Australia, which is a federal body in the department of industry. We expect those results to come back to government in February or March next year. It is quite a huge dataset that we are collecting over a very large regional area, and that data will be processed over the coming months.

Ms BATH — It is a shame that we cannot tighten the time frame in order to be able to see this during our inquiry, because I think it is very important that we are able to have a greater understanding. I am assuming that that is not possible.

Mr McDONALD — No, the data is quite complex, and we have made it more complex because we have asked a lot more questions about getting the geological history and formations. That processing time will be what it is, unfortunately. But from a geological point of view, as the geological survey always does, our knowledge of the earth is always growing. In science in general, knowledge is always building. We are building on the current knowledge of the geology of Gippsland with a seismic survey.

Ms DUNN — Thank you for your submission, lady and gentlemen. I wanted to turn first to a slide you had up there that outlined a whole range of concerns and a list that spanned primary producers, landholders, traditional owners and community groups and talked about regional impacts both negative and positive, the competition for water and the information asymmetries, which of course Ms Shing dealt with in her question. I note that in your submission there is a small table in relation to impacts for local and regional developments that looks at the economic side of things. What I am wondering is: has the department done any modelling or analysis on the environmental or economic impacts on existing industries? I ask that question because time and time again as part of these hearings we have heard from a range of people who are part of a vibrant local economy and are now very concerned about the impacts that they may face. I am just wondering if there has been any detailed analysis into those impacts.

Mr HURST — The short answer is no, the focus was on the water science studies as a first pass, then the community engagement activity in order to actually understand what the range of issues were, report back to government at the time and now put it in front of the inquiry in order to form a view about where to next. So if

there is a piece of work to be done, we will gear up to deliver it. If there is not to be an industry to proceed, then we will direct our time and effort to other quarters.

Ms DUNN — So is it a case of at the moment, given where we are in the process — I do not want to put words in your mouth — it is too early to do that sort of detailed analysis?

Mr HURST — Until the inquiry reports and the government responds, yes.

Ms DUNN — Would that be the same in terms of looking at environmental and health impacts and doing some more detailed work around that?

Mr HURST — Yes.

Ms DUNN — In terms of — —

Mr HURST — Sorry, I might just qualify there. We will be in a position to inform government as part of our policy advisory role in the government's developing its response, but clearly until we have the benefit of the inquiry's report, so we know what we are responding to, it is a bit hard to anticipate the full range of it other than to identify the broad aspects, as we have in the submission.

Ms DUNN — It might require further work from you.

Mr HURST — Equally we are looking at the submissions that have come in. I am aware that you have 1600-plus submissions there. There are some interesting ideas there. We are open to those ideas, not just in terms of what that might mean for an unconventional gas industry, if one is to proceed or not, but more broadly there are ideas that are worth looking at that that the public is bringing forward.

Ms DUNN — Thank you for that. I am interested in the department's view on the monitoring agencies that are involved in terms of their capacity to monitor both short-term and long-term impacts. Do you have any views in relation to that?

Mr HURST — Certainly if there is to be a new industry that has specific characteristics to it, the department, from a regulatory practice point of view, would need to gear up to deal with that, but again it would be premature for us to jump into that space.

Ms DUNN — That is a fair call. Lastly, I am just wondering if the departments are aware of the actual chemicals that are used as part of unconventional gas operations and whether you are cognisant of the full suite of chemicals used as part of that process.

Mr HURST — There is certainly a broad range. The previous government introduced legislation to ban the use of BTEX chemicals — so your benzenes and the like — because of the health concerns. That is the addition of BTEX chemicals. There is a range of other formulas that companies have used overseas and interstate, some of which is public knowledge and some of which is commercial in confidence. We would need to understand that in more detail. We would take advice from the EPA and the department of health.

Ms DUNN — There are some there for which there is non-disclosure of what those chemicals actually are at this point?

Mr HURST — That is my understanding, yes, but again we do not have an industry producing. We are trying to access information from elsewhere.

Mr RAMSAY — I would like to put my question to Dr Davis, if I may, in relation to hydrology, particularly in the Otway Basin, which is of interest to me. The submission indicates that the studies show that impacts from depressurisation, hydraulic fracturing and the like are low in the Otway Basin, yet in your submission you indicate that fact in Gippsland it is high.

Barwon Water presented to us last week in Torquay in relation to their role and provided a submission. They were concerned that they are excluded from the decision-making process in relation to onshore and conventional gas exploration, given that there is the overarching Southern Rural Water governmental agency and because a permit is not required, they are sort of excluded from the mandatory decision-making. Barwon

Water has a significant and important role in managing the aquifers and bores, particularly around Anglesea and Barwon Downs, which provide Geelong with its supplementary water. A concern of residents in the Otway Basin is that they could well be contaminated by any onshore unconventional gas exploration. I have not read reports that indicate the risks are low in relation to potential tight gas exploration, which seems to be perhaps a more economically valuable way of extracting gas in the Otway Basin.

The question to you is: based on the studies, are you convinced yourself that in fact there would only be low impacts on the groundwater, aquifers, bores and the like in the Otway Basin in relation to potential unconventional gas exploration perhaps using the tight gas methodology on our water tables? I know the farming community are particularly concerned about potential contamination by the use of that method.

Dr DAVIS — Thank you for that question. You are specifically referring to the findings from the water sciences studies that have been mentioned a number of times and that formed part of the whole-of-government submission. That is right. The water sciences studies were really a first-pass regional assessment of possible impacts arising from the full suite of onshore gas. In the Otway Basin — and we looked across Otway and Gippsland — the focus of the way we looked at the hydrology side of things was looking from the perspective of potential development scenarios, so hypothetical development scenarios, and how that might impact on groundwater pressures.

Based on the information we have available, which is obviously imperfect, for potential theoretical development scenarios we looked at where that might occur down through the profile — that is, what do we know of where the gas might be? What do we know of where the water might be in that profile? Then we simulated using hydrological models how that might impact on groundwater pressure, and then we calculated from that whether an impact was high, medium or low. It is really important to qualify that it was a first-pass technical assessment, and it was really specifically through the lens of looking at aquifer depressurisation specifically.

In the context of the water sciences studies, what we found in the Otway Basin was that the tight and shale gas, from what we understand, is relatively distant from where the water resource is, and the simulation modelling indicated it was unlikely to have a significant impact on groundwater levels according to the method we use. But I would stress — and we are really clear about this in the submission — that it was a first-pass technical assessment and a broadbrush sweep, so I think it is important to consider the results in that context.

Mr RAMSAY — The concern would be that people will pick that terminology out of the science studies and perhaps suggest it is a position that the department might take that there is low risk in relation to potential tight gas exploration in the Otway Basin, given the science studies. Your answer is saying in fact that there is not an automatic relationship between the studies and what might be the reality in relation to impacts of tight gas exploration.

Dr DAVIS — I guess what I am saying is that the studies are based on a particular broad scale set of analyses — a regional-scale, first-pass assessment — and the results need to be interpreted in that context. What we have done is, to make sure that as much information is available and to enable that information to be interpreted, we have made sure that we have produced the two plain-English synthesis reports, which hopefully are a more effective communication tool, but also all the technical reports that sit below that. The information is there, it is transparent and people can access the science that underpins that, so it can be interpreted in that context.

Mr YOUNG — Thanks, guys, for your submission. In reading through it, chapter 7 is about knowledge gaps in what we know about the whole thing, and my question relates to what work the department is doing to actually fill those gaps. If you could give us a couple of examples? I know you have already talked about it in a few answers to previous questions. But also, are there any of those knowledge gaps that cannot be filled without resuming exploration activities?

Mr HURST — I will take that one. There are two parts to that. There are gaps in the regulatory framework. As I have mentioned before, the national harmonisation framework identifies those key areas around well integrity and the like — water management, hydraulic fracturing — that would need to be put into the MRSDA act to deal with coal seam gas. Those components are largely aligned in the petroleum legislation. Then when it comes to knowledge gaps, the water science studies and also some other work we have done has identified a range.

If I take you to page 52 in our submission, there is a list there of things like the permeability of the seal rocks, so the overlying rock layer and its integrity in terms of preventing the movement of water or gas through it is quite a critical one, because it gives you an idea of how fluids are going to move underground. The delineation of the gas resources. We have quite limited information in some areas about the geological formations, so where things might move under the crust. The composition of some of the materials themselves and whether or not you would actually need to use hydraulic fracturing in some of the structures is unknown — and the only way to find that out is actually to do direct sampling of those structures and understand it.

The relationship between groundwater and draw down and river levels and aquatics ecosystems — there are number of flow-on effects there that we have not covered, again because it is a first-pass assessment. And the sort of mitigation measures you might put in place to offset water supply to farms, or something like that, the studies assume that for consumptive uses those things could be technically offset, cost has not being considered — that is an investment decision. In terms of offsetting the impacts on aquatic ecosystems, that is a larger task to understand because of the volume of water, the timing of the water and the quality of the water that is involved, and the potential treatment and transport methods that might be involved. So there are a number of gaps around that.

There are also gaps, if you are going to apply a multiple land use framework, to get the information that needs to be fed into it so you understand what the issues are, what the trade-offs are and how you are going to actually try to work out any synergies and/or deal with any negative impacts. There is a whole piece of work around that. At the moment, until you know where the gas actually is and if it is of a commercial scale, it is very hard to focus in on an area and say, 'Right, that is where it is going to be. We will now work through this range of factors and actually put the material up to make an informed decision about it'. We are right back to square one in terms of understanding the geology, the prospectivity and the broader environmental factors.

Mr YOUNG — Can that be achieved with the moratorium still in place?

Mr HURST — Some parts can. We can do certain elements on the precompetitive side on the geology — such as the seismic survey in South Gippsland is filling a gap — but in terms of actually understanding what is in the ground, ultimately it requires drilling to get the geological information, the geotechnical information, and it would probably require boreholes to test the permeability of the source rocks. That is a large cost and taxpayers will be paying for it.

The CHAIR — We have sufficient time so I am going to go around again, but we might do it in reverse order.

Ms DUNN — I am interested in what sort of oversight the department might have in relation to projects under licences and permits issued by the department. How does that work in terms of your role in oversight?

Mr HURST — I might pass to Ross McGowan as ED of earth resourcing regulation.

Mr McGOWAN — The process by which we oversight the industry is one based on risk. We will look at and categorise each particular site and each activity. We will categorise the risk that is associated with those particular activities. We will also look at the requirement for work plans and extract conditions on particular licences to satisfy ourselves that all of those matters that we are concerned about will be addressed. And obviously in the permitting process prior to the allocation of licences there are a range of referrals that will be undertaken to other agencies to ensure that they are comfortable with certain activities that might be going to be undertaken. There is also the environment effects process that will be undertaken if that is required under the planning act. So a range of activities are put in place to satisfy ourselves. Then we have an inspection regime based on risk, as I said, looking at those areas of risk which we believe need to be looked at. We would modify and undertake our audits and inspections according to the risk that is categorised on a particular site or activity.

Ms DUNN — To follow on from that and to try to understand that inspection regime, if it was assessed that a particular operation has a high risk, what sort of regime would be in place in comparison to a low-risk operation? I am trying to understand the difference in the two profiles.

Mr McGOWAN — It would depend on what particular activity is being undertaken, but it might mean that we have more regular inspections, more regular audits, more regular monitoring — so environmental monitoring. We may call on the Environment Protection Authority to also be involved. The regulatory

environment is quite a complex area. We also work closely with WorkSafe on the worker health side of the business. We try to work collaboratively together to ensure that not only are the environmental impacts controlled but also the workplace is a safe workplace.

Ms DUNN — Thank you for that answer. In terms of a more regular inspection and audit regime — I know it is hard to say when you do not actually have a specific example to draw from — if we are looking in the scale of high risk, is that in the order of an annual visit or more than annually? I am just trying to get a sense of what a more regular regime would look like.

Mr McGOWAN — It would be my view that if we were dealing with high-risk activities, then more than annual would be appropriate, but again it would be based on risk. If that meant that we had to concentrate more effort in a particular place or particular activity, that is what we would do. It is really about the outcome — making sure that companies are achieving environmental outcomes that we require them to do under the act, and to do that may require a certain number of inspections. To be prescriptive about the number of inspections, when we can be outcomes driven, is not necessarily the way in which we would do things. We would base it on risk.

Ms DUNN — Absolutely, and I completely understand that. In terms of the ultimate responsibility for risk management, and in the dreadful scenario that something might happen in terms of accident management of contamination or clean-up activities, who is ultimately responsible for that risk management and clean-up?

Mr McGOWAN — There is a range of safeguards in place. Certainly we have our legislation, the MRSDA and the Petroleum Act — the penalties under those acts with respect to compliance or non-compliance. If there were an environmental impact, clearly the EPA would be involved. They would necessarily have their legislation to fall back on. For example, if we were to use a mining example, we have bonds in place. The bonds are there, held by the Earth Resources Regulator, to help remediate the site back to an agreed rehabilitation plan. We hold that money, so it would be a bank guarantee with respect to mines, and quarries in some instances, to rehabilitate those sites. So there is a range of things that we could call upon and do to remediate the issue.

Ms DUNN — Ultimately it sounds like the cost, to a degree, falls back on the operator where there is a capacity for them to actually pay.

Mr McGOWAN — In the first instance we will be compelling the operator to do that, exactly.

Ms DUNN — Okay; thank you.

Ms SHING — I have got a very quick one. I will take you to part 7.3.2 of the submission, on page 61 at the top of the page. It refers to the risk of subsidence being moderate to high in relation to coal seam gas in Gippsland. We have heard evidence that subsidence risk generally in this particular subset of unconventional gas extraction is in fact low. That is one example of the competing views that we as committee are having to grapple with. I would like to get some more information, particularly given the high net value of land in terms of agricultural output in Gippsland, to understand how it is that this particular position has been arrived at — and I suspect, Paul, that is a question perhaps to go to you — but also to get your views on what you understand to be the case around the viability of coal seam gas for the brown coal as we know it to be deposited in Gippsland, given the current technology for extraction.

Mr McDONALD — Thanks, Harriet. In relation to subsidence in Gippsland, for example, you will note as part of the water science reports we looked at aquifer depressurisation, we looked at hydraulic fracturing and subsidence. We know in Gippsland there is subsidence in the order of around 2 metres around coalmines for extracting water. When we looked at the coal seam gas extraction or development scenario in Gippsland you will see that the maps have a high impact for certain areas, and that is because you will notice that the coal seams are actually in hydro contact with the groundwater. They actually sit inside the groundwater, so to extract the gas you need to extract the water. What happens when you extract the water out of an aquifer, depending on how much water you take, is you can actually compact the sediments. You will see in the water science report that the risk of subsidence has been estimated based on a development scenario, and this comes down to the likelihood of compaction from the overlying sediments. The risk of compaction to deeper tight shale gas, for example, is a lot less because the water that you are extracting is a lot less, so the water's magnitude is less. And the rocks are tight — hence the word 'tight gas' — so the ability to compress those rocks is quite low, whereas the ability to compress rocks that actually are quite porous and contain a lot of water is by its very nature high.

Ms SHING — The second tranche of my question was based upon what we know about technology for extraction of coal seam gas from the brown coal deposits in Gippsland, and the evidence that we have had is that it is not a particularly straightforward exercise, given the quality of the lignite that we are dealing with. Do have any comment in relation to that as far as the data that you are gathering around the viability of a potential industry — obviously without wanting to prejudice the outcome of the data analysis that you will be doing over the coming months?

Mr McDONALD — Thank you. Going on the studies we have conducted under what is publicly available information — we also sought to get extra information from companies who are operating in the Gippsland-Otway Basin as well, and some of those were forthcoming to inform the studies — when it comes to the extraction of the coal seam gas in Gippsland, as with all unconventional gas in Victoria, there are no commercial quantities of gas that have been discovered.

I understand that there has been a gas content been derived from the coal seams in Gippsland. This was done quite some time ago, and to my recollection it is only one reading. That area about the viability, if you like, of extracting the coal seams in Gippsland is not unique but it is unusual and not like the case in Queensland. There will be a number of studies that need to happen before to see, A, about the resource — if the resource is there — and the resource is all about, 'Is there gas actually trapped inside the coal seams?'. And if there is, what is the likelihood of actually extracting that gas? Those studies are at very, very early stages from my understanding of what the company has submitted.

Ms SHING — Thank you very much, very helpful.

Mr RAMSAY — Just a quick question, if I may, Chair. At the last hearing we had in Torquay there was discussion around a petroleum licence called PP163. Lakes Oil holds the licence. That is due for expiry in October, and I understand the minister has suspended all exploration at this stage. I am wondering, given there is no requirement for consultation in relation to petroleum licences, what sort of advice would you be giving to the minister in relation to that particular permit coming up for expiration in October, given that this committee will not report before then and that licence then will probably, I assume, go into never-never land. Could you give an indication of the advice you might give to the minister in relation to that permit?

Mr HURST — I will refer it to Ross.

Mr McGOWAN — Thanks, Simon. What we are able to do with those particular licences, because of the moratoriums, is suspend the activity on the licence and extend the licence for another 12 months, on application.

Mr RAMSAY — So Lakes Oil will be able to apply for an extension of that licence for 12 months at the expiry date?

Mr McGOWAN — That is my understanding, yes.

Ms BATH — I am interested in produced water, and I have had some conversations with farmers in the Longford area and with respect to other submissions in our committee hearings. I am hearing sometimes some differing views around this. I know one option is to bury the produced water back under the ground. That is option A, and I think it is on page 61 of your report there. I have heard that great potatoes grow with this produced water, and then I have heard that was the worst, the water quality is not there — I am differing. Can we learn something from another jurisdiction, from Queensland or somewhere else in Australia, in relation to produced water, around the management and quality of that produced water, because it is a concern?

Mr HURST — I might pass that to Sharon, if you do not mind.

Dr DAVIS — I think I have to take that one on notice actually in terms of what is being done in other states on co-produced water. I guess I would say that disposal of co-produced water underground in Victoria would need to be licensed. That is one point to note, which I think we mentioned last time. But I will take that on notice.

Mr DALLA-RIVA — Anthony, just going back to some of your evidence before, you indicated that in terms of trying to identify — and this is one of the issues that Shaun raised earlier — we are trying to get a feel for whether there is actually a substantial base of unconventional gas available.

Mr HURST — Yes.

Mr DALLA-RIVA — So the first base is to try to identify. It is sort of like the chicken or the egg, because at the moment we have obviously heard, witnessed, visited many community organisations, activists' groups where you would have to say — with a pun intended — the gate has been locked essentially in terms of the capacity for even considering exploration at any level to determine whether there is gas available. Because I think in the early stages I am trying to get the idea that there may in fact be not a substantial level of any unconventional gas, so all this is for naught, and it may be more available in the other states where it is currently in production.

I am trying to understand, from the committee's point of view, where you have huge community perception or otherwise, where the industry, in my view, has essentially lost the opportunity to argue the case, yet — and this is my question is to you — there is an indication in the presentation that for us to establish whether there is in fact unconventional gas we should perhaps allow some exploration. But I am worried that even some exploration — or, as some of the witnesses in the regional areas called it, exploitation — would not even be allowed. Do you have any comments about how you or how the department would perceive the capacity for some form of exploitation or exploration that would then pacify the community outrage that is currently in existence?

Mr HURST — That is a very good summary of the challenge before us all.

Mr DALLA-RIVA — Yes, that is why I am asking you. If I had the answer, I would make sure the weather was a bit warmer, but anyway — —

Mr HURST — It is getting that way. Look, we can certainly push the boundaries on the precompetitive geoscience work. There are costs if the state does that sort of work. The nature of unconventional gas in its broad scale across the landscape makes that, I would suggest, beyond the financial means of a state government to invest in and carry those risks. That said, if there was a need to identify fundamental rock characteristics of tight or shale or coal seams in particular areas in order to give a little bit more certainty about it, that is certainly not incompatible with the sort of work we have done in other parts of the state looking at geological structures and the like. But to make that investment decision — and if it was a drill hole, you are looking in the order of a million; if it is a borehole, you are looking at several million dollars per shot — that is a significant choice to make, and it is really a government policy decision to make: is that something they want to venture down?

I think it would be about getting those facts in order to inform the further discussion around it. From that, you might also derive some greater confidence around the way that that program is executed. I am mindful that Corangamite Shire Council, for example, recently made the comment publicly about its familiarity with an onshore gas industry — conventional gas industry I quickly add — in the Port Campbell embayment area, as well as the onshore-offshore activities. There may well be a situation where from a geoscience point of view we could do further investigations in partnership with our water colleagues in particular. That will answer one key piece of the puzzle, but it is about refining the confidence around those aspects, I guess, but it will not answer the question, 'Do you have a fully fledged feasible commercial resource?'. It will just provide more confidence about 'Are you on that pathway?'.

The CHAIR — Or not.

Mr DALLA-RIVA — Yes, or not.

Mr HURST — Or not. That is right.

Mr DALLA-RIVA — So following along that line of questioning, as I said, there is great concern about a company or companies being engaged. The evidence was that they are not necessarily going to be looking after the community and the environment. There is obviously the counter from the company, saying, 'We believe there is coal seam gas available, and therefore it is going to generate significant jobs and opportunities for Victoria'. Would an opportunity therefore be for a government to perhaps undertake some of that exploratory work, given that the cost, you have said, with the basis that it would be a government investigation or inquiry into identifying whether there is coal seam gas, and then we could have the question answered once and for all, or is it too difficult that you would need to do hundreds of drilling to rule it out?

Mr HURST — We can do relatively modest regional scales for the work — so single well, maybe two wells or a few boreholes or something like that — which will cost in the order of tens of millions. But if you go to the scale of full production, to go to the other extreme, in Queensland, for example, where there are several thousand boreholes, that is obviously a different scale.

Mr DALLA-RIVA — Yes, I realise that.

Mr HURST — But certainly in terms of refining knowledge about the geological formations, the integrity of aquatard seals — the pieces that are impermeable — getting that information, whether they are fractured and those sorts of things, is about bringing the various layers of geological information together. We have done the seismic in Gippsland; we did a gravity survey there looking at the density. It is about bringing those layers together and forming a view about what the formations look like and what the risks might be in order to then inform a government decision about going that next step. Certainly drilling holes is ultimately the way you find out what is beneath our feet.

Mr DALLA-RIVA — Correct.

The CHAIR — I have two further questions. One relates to page 49 of the submission and notes that the submission alludes to increased competition. Is it your view that if there were additional gas supplies onshore that that might assist with the low competitive nature of the gas market and that it might lead to increased competition and some downward pressure on prices?

Mr HURST — I might pass to my colleague Mark Feather.

Mr FEATHER — I think the point we were trying to make in the submission on this was that gas prices — and you have heard from other parties who are submitting on these issues — are increasingly now linked to international LNG prices. So the point we were making — —

The CHAIR — Although that is actually a choice, isn't it? We could in some way quarantine or reserve supplies for specific markets here. It might be against national policy, but there is nothing constitutionally — —

Mr FEATHER — Yes, the government could do that. That is a policy question and obviously something that this inquiry may want to consider. In terms of the broader question, gas prices are increasingly influenced by international LNG prices. For a Victorian gas find to have an impact on those LNG prices, you would have to find a lot of gas, because Victoria is only a very small component in what is an international market. That is the point we were making. However, there is a lot of work that is going on more broadly through the COAG Energy Council and within the government on trying to drive more competition in the east coast gas market. The ACCC is doing an inquiry, as you are no doubt aware, on competition and competitive barriers to entering the east coast gas market, and they are due to report next year, so questions about competition are really within their field.

From the department's perspective, I think the east coast gas market could work much more competitively. We have given advice to this government and previous governments about how we think there is a lot of opacity in the market. There is not a lot of information transparency. There is no gas forwards or reference price in the market, and that makes it very difficult for gas producers as well as gas users to price their risk. There is no forwards price, and without a forwards price it is very difficult. A lot of concerns have been raised by energy users about a lack of information on pipeline capacity and all sorts of issues, so there is a lot of work going on around market reform to drive more competition in the market.

The CHAIR — Information?

Mr FEATHER — Yes, through more information, and gas forwards prices, gas capacity trading hubs and all sorts of things.

The CHAIR — We heard from one group that they had contractual arrangements that if they were able to extract gas they would sell it at an undisclosed price, but under oath indicated it was below the current pricing. It seems to me that is prima facie evidence that there is a potential for individual suppliers to do a deal with an individual end user and put some additional competitive pressure into the market.

Mr FEATHER — Yes, that is right. Absolutely. What goes on in the market is difficult, because it is a very opaque market and there is not a lot of information around. The contracts that are struck are struck confidentially. Esso has recently struck a few contracts with AGL, Origin and a few other parties. It is highly confidential, but it is quite possible that contracts are struck at a lower price. The problem that a lot of the users are facing at the moment is that they are struggling to strike longer term contracts. They are finding that the producers only offer very short-term contracts. That, I think, is just a function of the uncertainty in the global gas market as well at the moment.

The CHAIR — The second point related to greenhouse gas emissions. This is summarised on page 28. There were two aspects to that. The first is substitution or displacement by gas of coal. Is there departmental modelling of any advantages or indeed otherwise of that?

Mr FEATHER — We had done a modelling exercise in 2013 — the department engaged SKM MMA — but the focus of that modelling was mostly around future gas prices and future gas scenarios. I would need to take that question on notice to look at the more detailed aspects of the modelling. The important thing to note with gas is that, from a greenhouse gas emissions perspective, gas for power generation is basically used for the peak. Peaking plant is gas plant. That only comes on your 40-degree days in summer, so it is a relatively expensive fuel to use. The electricity market is already very heavily oversupplied with generation, so on current forecasts you are not likely to see much entry of gas-fired generation in the market. That is the current state of play in the electricity market. Gas is an expensive fuel as far as electricity generation goes; it really only chips into the market during peak times.

The CHAIR — But it has greenhouse advantages compared to the coal.

Mr FEATHER — Yes.

The CHAIR — The second point is around fugitive emissions, and we had some evidence put to us in Torquay about fugitive emissions. I would welcome any departmental input on those submissions as a table, the significance of fugitive emissions as a greenhouse problem and whether that can be quantified in some way or other.

Ms DUNN — In relation to the slide that is up there, the first comment says, 'Impacts can be difficult to predict without baseline data'. I draw the committee's attention and our submitters' attention to page 21 of your submission, which also talks about this issue of baseline data, particularly in relation to biodiversity and habitat fragmentation. In the submission it says that impacts on biodiversity are difficult to quantify without adequate baseline data on prevalence and vulnerability. I just wanted to seek some clarity on essentially what the nub of that is saying. Is that saying that we currently do not have that sort of detailed data on habitat and biodiversity as a baseline for the state?

Mr HURST — I will transfer that to Lee Miezis from the department of environment.

Mr MIEZIS — Thank you for that question. I think what is referred to there is the need to undertake really site-specific analysis. So once we understand where a prospective exploration will occur, then we can better understand what the specific and actual impacts will be on biodiversity values.

Ms DUNN — So just to confirm, we do actually have some baseline data on habitat and biodiversity across the state but not on, say, a site-by-site-specific basis.

Mr MIEZIS — That is correct.

The CHAIR — Can I thank the department for its submission. The secretariat will want to follow up. I think there are a number of questions, too, to be followed up, and I will get Keir to define a list of those and send that across, but there will also, I think, need to be some further discussions on a whole range of different matters. Thank you.

Mr HURST — Thank you, Chair. Thank you, members.

Committee adjourned.