

# TRANSCRIPT

## STANDING COMMITTEE ON THE ENVIRONMENT AND PLANNING

### Inquiry into unconventional gas in Victoria

Sale — 1 July 2015

#### Members

Mr David Davis — Chair

Ms Samantha Dunn

Ms Harriet Shing — Deputy Chair

Mr Shaun Leane

Ms Melina Bath

Ms Gayle Tierney

Mr Richard Dalla-Riva

Mr Daniel Young

#### Participating members

Mr Jeff Bourman

Mr James Purcell

Ms Colleen Hartland

Mr Simon Ramsay

#### Staff

Secretary: Mr Keir Delaney

Research officer: Ms Annemarie Burt

#### Witnesses

Mr Dane Stewart (affirmed), manager, resource development, and

Dr John White (affirmed), government and community liaison, Ignite Energy Resources.

**Necessary corrections to be notified to  
executive officer of committee**

**The CHAIR** — I ask Dr John White and Dane Stewart from Ignite Energy Resources to come to the microphone and give us your name and contact address.

**Dr WHITE** — I am John White from Ignite Energy Resources [REDACTED].

**Mr STEWART** — My name is Dane Stewart. I am from Ignite Energy. [REDACTED].

**The CHAIR** — Can I get you to make an introductory statement? Then we will ask some questions.

### **Visual presentation.**

**Dr WHITE** — First of all, thank you very much to the committee for allowing/enabling us to appear and present some information and answer some questions, hopefully, on behalf of Ignite Energy Resources and in particular Gippsland Gas. We are an Australian company based in Victoria. Gippsland Gas is a wholly owned subsidiary of Ignite Energy Resources. We are an integrated resources and technology company. We are seeking to develop and operationalise new technologies to make use of/create new products with lower emissions than are currently experienced from lignite in Gippsland.

Lignite is commonly known as brown coal. It is actually termed lignite under the act here in Victoria. It is very young organic material. We have a large exploration licence over a very vast amount of lignite at many depths, from expressions at the surface down in multiple layers to as deep as 1200 metres throughout the area of our licence. It is a bit hard to see, but on the first slide is the country to the south-east of the Strzeleckis from around about Barry Point up along the coast to the lakes and stretching in towards the Latrobe Valley.

This country between 5 and 20 or 30 million years ago was very lushly vegetated. It must have been an era when there were very much higher CO<sub>2</sub> levels in the atmosphere than there are now. There were magnificent stands of trees. They were more like conifer trees, more like Norfolk pines, in those days. The climatic conditions persisted, and a horizon of 1000 or more metres of vegetative material was laid down in between sea incursions, which laid down sand and silt and sometimes limestone. So there are multiple layers of lignite, which is really just old peat, and it is still very wet and very vegetative. Even down at 700 metres, where we have cored and tested, there is still living biology in this rather organic material you call brown coal in the valley. It is actually lignite. It is a marvellous resource. It is extremely clean; it is low in contaminants of all types, like peat material. The problem with its use in the valley is that old power stations seek to burn it, in effect, and have to evaporate the water and create enormous amounts of CO<sub>2</sub>.

Our company is looking to exploit the natural gas in the deeper lignite seams. This is really almost organic material. The gas we have sampled from 700 or 800 metres deep around Burong in some trial wells we drilled many years ago — six or eight years ago — has been tested, and it is biogenic gas. Really, the point I want to make to introduce is that this is a different geological and physical circumstance from the gas in old black coal, which can be hundreds of millions of years old, having been driven down and which has all sorts of what you may say are contaminants in it. The water that we have sampled from the lignite seams around Burong is of agricultural quality. We provided the water to the farmer to his great satisfaction, and he irrigated lucerne and potatoes and was very happy during the drought of six or eight years ago.

I want to say that I welcome this committee, I welcome the science review and our company welcomes it because, really, a lot of facts need to emerge about the true nature of this potential clean gas resource, which is of vast potential quantum beneath Gippsland. Our company is committed to doing it to the complete satisfaction of regulations, in harmony with farmers and helping farmers to enjoy more water — clean water — that we will bring up and improved infrastructure. In a gas field like this a particular well will last between 7 and 15 or so years. We would be committed to restoring the land at the end so that you would in effect not know that the process had occurred.

I endorse many of the economic and employment benefits that Rob Annells described. On this slide you can read where we are. We believe there is gas in the deeper lignite seams. There are increasing gas prices in Australia. I will make a comparison. I travel to the States a lot. In the last three to five years the price of energy — electricity and gas — has almost halved in the States. In Australia in the same period, for a number of reasons, it has almost doubled. That is a real shame, because it is hard on poor people and it is hard on industry.

America is bringing its manufacturing home from China; we are still sending our manufacturing away. We should be looking for all sustainable and sound ways to create more energy supply at lower prices.

That is our vision: to unlock the potential of this particular resource that our company is fortunate enough to have the right to try to access. We must do that with the complete cooperation, agreement and will of the community. Our approach is to start the exploration, start trying to find out how much gas is there and how to exploit it safely, with the agreement of the government and the community. We will adhere strictly to all regulations and legislation. We will make suggestions where they can be improved, if we see that. We would like to work transparently.

I think the great thing, to go to the bottom of the box at the right, is that we do not think we will frack. We do not think we can frack, because lignite is rather wet. It would be like fracking a peat bog. We need to work out, though, if we can develop this gas. We do not know today. It is R and D, in effect. The testing and drilling we have done on a farmer's land showed that the water we drew up was, in effect, new water from way, way beneath existing aquifers. It is agricultural quality, without treatment. We have processes to bring biological fertiliser from lignite to farmers, and we have proved on hundreds of farms that we can help the farmers increase their soil carbon content.

I am part of a group that has just won a project under the Emissions Reduction Fund worth \$50 million with 30 or so farmers to increase their soil carbon — to sequester CO<sub>2</sub> from the atmosphere and improve the quality of their soil. Our vision is to bring this knowledge to farmers in Gippsland, particularly on that fairly sandy country to the south-east of the Strzeleckis, and actually sequester atmospheric CO<sub>2</sub> using the water, should we ever be allowed to develop, from the deeper lignite seams. We could be aiming at a zero net emission energy development. That is quite exciting. It is visionary. It is untested, at least in terms of the gas availability.

I am sorry that that introduction was a little bit lengthy, but there is a scene of possibility to set. We must do it safely, sustainably and with people's agreement and buy-in. Can I hand over to Dane, who has a much more geological depth of knowledge than I have.

**Mr STEWART** — My name is Dane Stewart. I am a geologist with 12 years experience in a number of different commodities around Australia, including time spent with the New South Wales Department of Primary Industries as an environmental consultant as well as in a strategic and advisory sense. I have broad experience with a particular focus on exploration program management.

The first thing I wanted to talk about in relation to the terms of reference is the prospectivity of the basin. I think it is very important to deal with that first. Essentially it is the 'Why are we here?' question. If the basin is not prospective, then this is all for not much. We have completed an extensive technical review of the basin, stretching back since before our active exploration began in the Burong region. From the information we have collected from our initial drilling program as well as the tens of thousands of wells that have been drilled across the basin by the department and by other explorers, more than any other project I have ever worked on, there is a substantial knowledge base already so we are able to fairly accurately estimate the geology that we are moving through. We have a very good knowledge of what rocks are underground, and from that and from the knowledge that we gained from our Burong drilling program, we were able to estimate a resource. You can see that in the presentation in the top right of that slide. Those are the gas resources within the lignite seams that we have identified. Basically that is our target. That is our assessment of the prospectivity of the basin. That is a best case assessment of what we are aiming for.

**The CHAIR** — What is OGIP?

**Mr STEWART** — That is 'original gas in place'. That was the estimate completed by MHA Petroleum Consultants, which is an independent expert organisation that does these sorts of estimates all the time. It is something that has provided us with a firm target and a real reason for operating here. If we did not have that, if we did not have such a strong target or reason to be here, we just would not be proposing to do this exploration and spending this money as we have been.

We are looking for really three things to assess the prospectivity of a particular basin. There has to be the capacity, so there has to be the volume container for this gas, and then within that we have to assess how much of that container is actually full, which is the saturation. Then the final thing is the permeability or how easy is it for the gas to flow out of that container once a well has been drilled into it. To that end, we have learnt a fair bit

from our initial exploration program and our desktop study of the basin, and it is that there is gas present within the lignite seams. As John said, it is biogenic, so it is low in CO<sub>2</sub> and other contaminants. The water produced is of agricultural quality. It can be used in those activities. With all this information we have gathered so far, we have been very active in assisting the Victorian government and Geoscience Australia with their — —

**Dr WHITE** — Do you mind if I just say something? We have both said it is biogenic gas. It makes it very different to the gas on the east coast coal seam gas fields, which is thermogenic in old, black, hard rock coals. Ours is soft, lignitic, peat-like material. Thermogenic gas is created over hundreds of millions of years by being buried deep under temperature and pressure. The gas in our young, almost near the surface lignite but down to 1200 metres, is created by biology chomping away at the organic material, as happens in a landfill — to organic material put in a landfill — which is commonly tapped with pipes on every landfill and fed into the grid or electricity generation. It is very different; it is very important to understand this is different.

**Mr STEWART** — And exciting. I am speaking professionally as a geologist. I am excited about exploring here because it really has not been tested for gas content and gas producibility yet. We know a lot about what is there in terms of geology. But it has not been explored as a potential gas resource yet, and it is exciting to try to gain that knowledge. As a geologist, you are always very keen to understand something that has not been understood before, and we really do have that chance to understand that at the moment. While drilling is currently not allowed, we look forward to the time when we can assess that and gain that knowledge.

I was just saying that we have been actively assisting the government and Geoscience Australia with their current research into the basin, its prospectivity and the groundwater resources, and we will continue to do so. We have been very open with all of our information. It has been a fantastic experience to be able to work closely with the regulator to understand what their drivers are and undertake any extra work that we can do that will help them to gain a basin-wide understanding.

I will go on to regulation and the environment now. As you can see on the right-hand side of the slide, that is a typical coal seam gas well. In some ways it is a good analogy for what we are trying to do in lignite in terms of the set-up of a well. It is important to note that groundwater is protected at all times, as the previous speaker said. This is no different; in fact it is much more stringent in terms of recognition of the departmental guidelines that we follow to drill these wells. They are comparable in terms of the drilling process to all the other drillholes that have been drilled, and it is cased through all the surface aquifers by two layers of steel and then an intervening layer of concrete.

What I am talking about here is essentially an exploration well. We are nowhere near the stage of an operation at the moment. We really are trying to figure out a ground truth this resource estimate that we have done and figure out the commerciality of the resource that is under there. We are a really long way away from understanding what an operation here might look like, so we will not know where any surface infrastructure would be or how many wells or even employees or anything like that. This is purely, as John said, research. There is potential for a commercial operation here, and we recognise that. That is why we are here. However, we are a long way away from being able to define exactly what this operation will look like. It is very much a preliminary assessment of our theory about the basin.

To that end, I would like to focus mostly on the exploration side of things. I cannot readily defend the impacts of an operation because I do not know what they are yet. But with respect to exploration, I can say that there are negligible impacts. As John said, we are not fracking; we really are just trying to understand the properties of the coal in terms of gas composition, and from that we build an understanding of a reserve, which is the commercial resource, basically. To that end, we also recognise that there is fair level of both scrutiny and concern from all members of the community about what the possible result might be. We have undertaken a number of different strategies and consultation efforts to help all stakeholders to feel comfortable with what we are doing.

We have doing a baseline groundwater study around any proposed exploration areas, and that has involved sampling and characterising a number of the different aquifers that we would be going through. If you look at that picture, every aquifer that we pass through down to the lignite has been sampled and characterised so that we have an understanding of the baseline quality and metrics of each of these aquifers. That has been handed to the government as well for their studies. I believe we have really gone above and beyond what has been required of us. In an academic sense, we have tried to contribute to the body of knowledge up-front so that down the track we can answer all these questions almost immediately.

In terms of operation, and I think Tim from Lakes Oil touched on this as well, aquifer isolation and minimal environmental impacts need to be achieved for these wells to be economic. You need all of these three things for it to be operational and for it to be an asset that is worthwhile. We cannot have an asset that is not isolated from aquifers because then we would be unable to de-water the coal and produce in any economic fashion. In terms of economics — technical and environmental — it is just not in our best interests to do that. We are going above and beyond industry best practice in terms of exploration and doing so in operation to ensure that none of the impacts that have been discussed are ever going to come about.

As somebody who has worked in Queensland, New South Wales and Western Australia, under both petroleum legislation and mining legislation, I can accurately compare the legislative frameworks under which I operate. The exploration regime that I am currently operating under is almost identical to every other one I have worked under in terms of practice. The structure of the legislation might be different — there might be different terms — but essentially the drivers are the same. The methods of regulating and taking a risk-based approach to exploration are very similar. It is seen across all states. There are slight anomalies around what falls under petroleum and what falls under mining legislation, but ultimately it is the same framework. I am speaking about that just in exploration terms. In terms of operational, I am not sure yet; I am yet to acquire that legislation.

Further to that, there are pieces of federally produced material, like the national groundwater harmonisation framework, that have required states to come into line and provide a consistent approach to assessment of these activities. I do not see there being the need for any wholesale change of the legislation or regulation. I think it is very robust at the moment, and I do not see the need to increase the risk and impediment to industry when essentially we already have a framework that I think is extremely workable.

I wanted to finish on coexistence. Everybody is speaking as though gas extraction and agriculture are mutually exclusive — you can only have one or the other. It is really not the case. All of my experiences, both in mining and exploration and gas, both conventional and non-conventional, have been that they can occur in the same place and in fact they can be mutually beneficial to the landholder and to the operator. Farmers are essentially business owners. They have an asset, which is the land, and once it can be shown that that asset can produce even more using a different style of production — not agricultural but actually gas — and that they do not have negative impacts on each other but rather can actually operate almost in tandem with very little change to agriculture operations, everyone comes out ahead.

To that end, we have had very few problems when dealing with landholders down in Gippsland. The people we have approached have been very receptive to working with us. We do not want to work with anyone who does not work with us, so if people are not even open to our approach, we do not approach them. Further to that, everybody we have approached has been keen to work with us, and to that end we have signed landholder agreements already with the aim of doing exploration on those lands.

Unfortunately, just as we signed those agreements the moratorium came into place last year, and so it has all gone into a holding pattern. There is compensation, and there are benefits for landholders. There are obviously direct compensation payments. However, there are also things like, as John said, the irrigation, using the water extracted from lignite; on-farm infrastructure, so new fences, new roads and gravel, as was suggested by Rob; and the chance for local employment that you otherwise do not get. A lot of the stuff that we do, be it earthmoving or biological or heritage consultants, can be sourced locally down there; in fact it is preferable for us to do that. At least in exploration, it is win-win for everybody.

I have lived in a number of different communities where it is much more advanced and there is almost an operational regime up there. It is a really positive place to work. People are no longer sending their kids away and not expecting them to come back. In fact people are going to university and coming straight back to the town they grew up in because now there is an industry there that they can work in. I think that is it. Questions?

**The CHAIR** — As I understand it, this is quite a different process to the ones we have been talking about before. So you have lignite, which is fresh coal — and tell me if I am saying something that is wrong — very recent, geologically. It is partially decomposed, as it were, and it is a potential source of gas in a biomass sense.

**Mr WHITE** — Correct.

**The CHAIR** — But this is new; it has not been done elsewhere in the world. Is that correct? Do I understand that correctly?

**Mr STEWART** — There has not been a gas extraction operation that has used coal anywhere near as young as what we are proposing. It really is a transition phase from peat to actual coal. There is very little — geologists call it ‘rankification’. So as the coal increases in rank, it increases in both blackness and energy content. We really are at the start of that where you can still see the trees and the leaves and stuff like that. It is just beginning to lithify.

**Mr WHITE** — The gas is in the lignite. It is a question of whether the gas can be extracted economically. It is unlikely, almost impossible, that you can frack it as a means of getting it out. The most likely way to get the gas out is to pump water out from the lignite seams, and they are — —

**The CHAIR** — Which is the opposite process to what is proposed in other situations, where you are actually trying to cause disturbance in the resource.

**Mr WHITE** — Correct. The great thing potentially about this lignitic material, the biogenic nature of the gas and the youth of the material is that the water is quite clean and usable, and it is water within the lignite seam. We are not going to take water from another aquifer. If we were, it would be pointless to pump it because it would not have gas in it. So this is quite different to the east coast situation. Our water, most likely, will not require the extensive treatment and the contamination of salt and the other materials that are in that water on the east coast black coal fields.

Really there are a lot of things to learn about this, and we would make the same proposal. In fact we made the proposal to the government just after the election that in view of the ban on the holes that we had planned to drill on the farms where we had complete agreement and for which we do have work plans, we would like to suggest that one or more of those sampling drillholes be drilled as part of the science study to actually get some facts about the gas and the lignite and the water down between 500 and 1200 metres in many different seams, because without those facts you could argue that the science study is irrelevant because it will not know what is the material that we are talking about.

**Ms SHING** — Thank you very much, gentlemen; that was very helpful. I would like to know a little bit more about the way in which the extraction of water from a lignite source could be a catalyst for or a contributor to subsidence. And in relation to what your understanding is of the geological lay of the land in this particular area, what risks have been identified in relation to potential subsidence, not only for that layer but also for the surrounding aquifer aquatard sections of the land?

**Mr WHITE** — Could I ask Dane to discuss the geological aspects of the water and the lignite seams and any connectivity to other aquifers? Then I would like to say something about the use of the water.

**Ms SHING** — Just in the interests of time, sorry, it will have to be pretty quick.

**Mr STEWART** — I will be very quick. The water we are talking about, the seams that we are targeting, are 500 metres to 1 kilometre down. It is really important to note that we are not removing wholesale any water from near the surface or indeed any of those surface aquifers; they are all protected from what we are doing. In addition to that, the water we are removing from the seam has to be isolated from every surrounding unit, so essentially the coal itself is an aquatard. The water we are removing from — we propose to remove from — the lignite, I mean, it has not been wholesale produced from any well yet, and we are not even proposing to do that in our exploration activities. So from what we are proposing there is no subsidence; there just cannot be, because it is not going to occur.

In terms of an operational framework where if we did produce, the depth at which these seams occur and the amount of water with which we would produce, it is very unlikely that there could even foreseeably be any subsidence whatsoever. However, because we are so far away from that stage yet of understanding, I cannot quantify it exactly other than to say it is a very, very low risk and it is highly unlikely it will be able to go ahead if any subsidence occurs because it just would not be technically, economically or environmentally feasible.

**Dr WHITE** — But as to the potential use, we did in 2007 pump some water from some drillholes on Gregor McNaughton’s property near Burong. That water did have gas in it, which we flared. The water was of agricultural quality, and we built a dam for Gregor McNaughton. He very beneficially used that water, with all approval, for irrigation of lucerne and, later, potatoes. So there is a great opportunity here for, in effect, new

water from completely new sources much, much deeper than the surface aquifers that are currently used. That will be of great value in that country out there, which is pretty sandy and sometimes in a rain shadow.

As I said, we have a whole separate technology and proof of it working, that by extracting humic-fulvic material from Gippsland lignites — and they are some of the highest humic-fulvic-content lignites in the world in the surface-weathered layers — we make a biological fertiliser, which is in effect a carbon-based fertiliser, not a chemical fertiliser. We have demonstrated on hundreds of farms — if you go to Soils for Life, headed by General Mike Jeffery, who has become the national soils advocate under the previous Labor government, confirmed under the Liberal government — where use of this fertiliser can replace chemical fertilisers. It grows greater root growth, more photosynthesis, deposits year-on-year CO<sub>2</sub> turned into carbon by the crops into the soil, holds water, rebuilds biology in soil, increases quality of soil, increases yields.

The great thing is that you are sequestering CO<sub>2</sub> into soils, and that is now a carbon credit under the Emissions Reduction Fund, carbon farming initiative — the only bipartisan climate change legislation there is, put in by a Labor government, confirmed by this coalition government in Canberra. This is a climate change-mitigating activity, it can be a source of revenue for farmers and it can help us head towards a zero net emission economy — of course with more renewables and of course with lower emission. But gas is a lower emission energy source than traditional brown coal power stations.

**Ms SHING** — We might have to leave it there, just in the interests of letting everyone else have a turn.

**Mr YOUNG** — How long is the time frame going forward from now, in a perfect world with the moratorium lifted, before you are in production?

**Mr STEWART** — It is difficult to say but not for at least two to three years, likely longer. However, as everything is on hold now, to mobilise the exploration again, to gain those initial results and then to further use those to calibrate any further activities, yes, it will be at least two or three years before we have an understanding of the reserve — and then after that, development, say up to five, perhaps. But it is very hard to say.

**Ms BATH** — You were saying that this is a different situation to other types — we will call it coal seam gas.

**Mr STEWART** — Yes.

**Ms BATH** — And that there is no fracking, potentially, going to happen, and that we are still working under the same legislation. So basically: the moratorium is there, you cannot move; the moratorium is not there, you can. Is that correct?

**Mr STEWART** — Yes, that is right.

**Ms BATH** — My other comment is that biogas is methane, just for clarity? At the end of the day, it is still methane?

**Mr STEWART** — Yes, that is correct.

**Dr WHITE** — It is pretty much pure methane.

**Mr STEWART** — Yes. There are slight differences in the composition of thermogenic and biogenic, which are pretty obvious once you do the laboratory testing on it.

**Ms BATH** — Two quick questions, then: where else is this done in the world, and are we the sole traders of it, potentially?

**Mr STEWART** — Yes, we are at this stage. Because of the vastness of this resource and its location, it really is a one-off sort of thing. I mean, as a geologist you always try to look to other analogies to begin exploration and understand, ‘Okay, well, what is this like? What techniques can I use to explore this?’, and the fact is that it has not been done — in coal — anywhere near this young before. The one analogy we did use was the Powder River Basin in the US. But that again was a sub-bituminous coal, and that had been underground for almost 100 million years rather 10 to 20, which is what we are looking at down here. So the coal has not been cooked yet.

**Dr WHITE** — As I said, it is more akin to landfill gas extraction, except deeper. It is biogenic gas, as in a landfill.

**Mr BOURMAN** — I will be very quick. It is actually a technical question, really. Looking at the picture of a wellhead, you look down and it goes down into the lignite. Given that lignite is not very viscous, how far will a single wellhead actually be able to extract?

**Mr STEWART** — That is a good question. I have no idea. That is what we are trying to assess. The next program that we had proposed was going to assess just that, to understand if we were able to move water or, if we move water or even pump water down there, how well does it flow through things. And then from that we will be able to understand, ‘Okay, if there were to be an operation, how many wells would we need? What would that spacing need? Would there be any stimulation required?’. We just do not have answers to that question yet.

**Dr WHITE** — Submitters at Lakes Oil are proposing some horizontal drilling into the gas-bearing layers. I mean we could, if technology permitted, perhaps consider drilling horizontally into the deeper lignite so that you can access greater length from a single surface well.

**The CHAIR** — I thank you, Dane and John, for your information. Again, the secretariat may want to talk to you as we go forward. I understand you will put a further submission forward. Thank you.

I thank all of those who have been through these two days of hearings. There are quite a number of people who have been in the audience for the whole period, as submitters or as observers. I thank you for your interest in the inquiry. I thank Hansard and the secretariat staff for their support through this process, and all of the submitters too. Thank you.

**Committee adjourned.**