ECONOMIC DEVELOPMENT AND INFRASTRUCTURE COMMITTEE

Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria

Melbourne — 27 August 2007

Members

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Mr M. Middleton, Marketing Manager, Ozmotech Pty Ltd.

Necessary corrections to be notified to executive officer of Committee

The CHAIR — Welcome to the public hearings of the Economic Development and Infrastructure Committee's Inquiry into Mandatory Ethanol and Biofuels Targets in Victoria. All evidence taken at these hearings is protected by parliamentary privilege. Comments you make outside the hearing are not afforded such privilege. Could I ask you to state your name, if you are representing an organisation, your position within the organisation, and the business address?

Mr MIDDLETON — Certainly. I am Marc Middleton, the marketing manager of Ozmotech Pty Ltd, 752 Blackburn Road, Notting Hill.

The CHAIR — Thank you; over to you, Mr Middleton.

Mr MIDDLETON — I thought I would start today by running a short animation — it takes 4 minutes or so — of our particular products. We have been very conscious when preparing for today not to become too company-centric, but it has been difficult because when you talk about the industry in the alternative fuels industry we are alone in what we do. There is nobody else in the world who does what we do. And waste to fuel, in the sense of biowastes, et cetera, is still very much a developing industry, whereas our system is now complete. It works. We are building one, as we speak, in Ireland, where it is a proven technology. So we stand somewhat apart from the rest of the industry in the long term, because we are in that position already. Having said all that, so that you understand what we do and what we can do for a range of community benefits and triple-bottom-line benefits, I thought I would run a short animation and a very, very short PowerPoint presentation, just so you can see some aspects of the systems operation. I will then read a prepared presentation, if that suits you, and be happy to then have a discussion. Does that suit you, Chair?

The CHAIR — Thank you.

Animation shown.

Mr MIDDLETON — It is a bit promotional, I must confess, but it serves its purpose.

Those gases now represent all of the heat source. Except for start-up we do not need to bring any gases in from outside at all. It has a production efficiency of 90 to 92 per cent. That is feedstock dependent. If you get 100 per cent PEs, et cetera, that are really clean you can get above that, but the reality is that there are contaminants, particularly moistures. It is also part of our long-term research program to be able to handle high levels of contaminants and different types of contaminants and moistures. But, importantly, it can handle mixed plastics, unlike most recycling processes that need to separate out. We do not handle PET, which is also an issue for us, but equally PET has a very high residual value as a waste product, so we are more than happy for people to separate the PET and send it off to do whatever PET does — turns it into carpets and that type of product. The PEs, PSs et cetera are very good for our system — and polypropylene.

There are four key areas. They are the environmental benefits, which we will briefly go on; the operational stability, which is now proven because the system is up and running, and I have some photographs of the real one; fuel compliance, which also is now addressed; and financial viability, which we will go through today. Feedstocks, as I mentioned. Most plastics, things like bins. Things like chemical drums, with the ability to handle contaminants, et cetera. And particularly used oil bottles under the national packaging covenant, which is a big problem; our system not only handles the plastic bottles, et cetera, but also handles the residual oil inside. It cracks it down into fuel and lights as well. We are working with the NPC. They are doing their own research on collection systems, et cetera. Because we can handle contaminants we are in a strong position from that point of view. That is plastic purgings from manufacturing processes. Plastic bottles, bottle caps from domestic consumer use. Shrink wraps — that is just perfect because they are very long carbon chains, and that is as good as you can get. That is beautiful stuff.

I will move into the footprint. This is the actual plant. Before we sent the plant to Ireland we built it so that it was complete and up and running over in Altona, just to make sure everything worked. It cost a fortune but we felt it was necessary. This is the very first one in the world, so we thought we would make sure it worked here before we struck any issues over in Ireland. We have about 16 people over in Ireland as we speak reinstalling this plant over there. This one has a bit of an expanded footprint, only because we had so much land to put it on. Generally you could put it on a block of land of about 50 metres long by about 40 metres wide for the plant itself. You need things like plastic storage and tanks, et cetera, but the footprint of the plant itself is quite tight. In Ireland it is going inside a building which has been built specifically for the purpose. That in fact is the main distillation column that you

saw in the animation, and on the right-hand side the large vertical tank is a gas scrubber. That allows the system to be very low in emissions. We got works approvals through the EPA and the local council and all that sort of thing quite comfortably.

As in the animation, it satisfies any standards requirements for fuel compliance, and in fact we can tweak the system and turn certain aspects of it up or down. One of the great features of it is that it produces a fuel with a very high cetane rating. Normal Australian cetane rating specifications are 46 to 51, and ours comes out at an average of 57 to 62. That means that the fuel burns very, very cleanly inside the engine. Engines run more smoothly, they start more easily, they are quieter and there are far lower emissions.

The CHAIR — Could you give us those figures again?

Mr MIDDLETON — Yes. In fact the figures are here; they are in the document that I handed over this morning. There they are, the fuel specs, with the average standards — that is, Australian standards. You can see that our cetane index is higher, our flashpoint is on spec, our density is on spec — all of them. We are low in sulphur. In fact if we get 100 per cent clean plastics with no contaminants then the sulphur could be as low as 2 or 3 parts per million. Next year it comes down to 10 parts per million, national standards. Viscosity is obviously for flow; with ash content we are about one-third — no, 3 per cent; then there is lubricity and PAH — that is, particulates, smoke, soot et cetera — which we are well below as well.

In 2001 we applied to the Federal Government. There was an article published in the *Herald Sun* and some bright spark from the tax department read it, rang us up and said, 'You realise that you will be subject to excise with the fuel you produce?'. We said, 'Well, no'. We challenged the ruling and we were successful. The ATO — this is from the ATO's own website — gave us a ruling that diesel produced from waste plastics is not an excisable good, and that the reason for that is 'the fuel produced is too far removed from the original source'.

The error that some people in the Federal Government were making is that they were still linking the fuel to the original crude oil, rather than considering that the link between crude oil and the fuel that we produce is broken at the moment the plastic becomes a waste — that is so say, it ends its first useful life at that point, we believe. Also there are technicalities. It is chemically different. A chemist can look at fossil fuel and look at our fuel and tell the difference. We have unsaturated carbon ends; fossil fuel has saturated carbon ends. There is a range of elements that differentiate it from standard fossil fuels. But also one of the key aspects is that the perceived link between our fuel and the original depletable fossil fuel resource is broken at the point at which it would either go to landfill and therefore be at zero value, if not a cost, as distinct from going off to be turned into a valuable high-energy diesel fuel.

This is the list that was first put out by the Prime Minister on 16 December 2003. This is the definitive and, as at today, unchanged list of alternative fuels. Under biodiesels comes ethanols. At the moment they attract excise concessions of 100 per cent, up until 1 July 2011, at which point they will then only incur 3½ cents, and it will be incremental until 2015, when they will still be charged only 19.7 cents — that is, 50 per cent of the current ruling. Our fuel and any other fuel that is not already on that list in the first four of the section is subject to excise because the act says that all fuels for use in internal combustion engines will be subject to excise except those that are on the list. For the last two years we have been unsuccessful in getting the Federal Government to add waste-derived fuels to the list, and that is a major factor for today.

Just to go through the benefits from production itself — this is comparing the plant emissions against refinery emissions to produce 1 litre of fuel, and the information is in the document I have given you this morning — is 420 grams per kilolitre produced of emissions for fossil fuels. Canola is five times that amount; soybean is nearly three times. Waste oil is only 42 per cent because waste oil is given a zero environmental burden at point of manufacture. That is to say, when they turn waste oil — that is, cooking oil — back into a diesel fuel it does not carry any of the environmental burden in the lifecycle that was taken up in order to produce the product in the first place. Tallow is above, and as you can see, even allowing for an environmental burden for the manufacture and lifecycle of plastics, is still below fossil fuels.

The next one is the most important though. This is out of the exhaust pipe of an engine using the fuel. All the non-renewable fossil fuels, and of course, that is normal standard BP diesel — or Caltex or whoever it may be — are rated as one. You will see that in carbon monoxide emissions thermofuel is only one-fifth of the carbon emissions of fossil fuel, 86 per cent of carbon emissions of NO_2, only half the particulates, and biodiesels are in the

last column for comparison. So, in fact, biodiesel puts out more NO_2 than thermofuel diesels, and again this information is in the document you have.

The next slide is a summary of the other document in percentage terms. In fact, you can see that when we use different plastics we get different results. These are not greenhouse gases, which is part of the issue. Carbon monoxide, NO_2 and particulates are not greenhouse gases; there is no direct correlation between that CO_2 equivalent, which is unfortunate, but we are unable to argue to the Australian Greenhouse Office that we offer greenhouse gas emissions benefits until we produce sufficient fuel to run long-term tests, which will not be until March or so in Ireland. The carbon monoxide, the NO_2 and the particulates are smog, and so any reduction obviously has some benefits for the community so far as reduction in haze and smog et cetera.

One of the things we will discuss today is renewal energy and alternative energies. The US EPA has defined renewable energy sources as regenerative, and that is biodiesels and all of that sort of thing. We would argue that the waste stream makes waste virtually inexhaustible. Melbourne will produce just the same level tomorrow as it did yesterday, and the same the day after, in that it is an inexhaustible supply of waste over the foreseeable future; that is to say 15 to 20 years. There will be reductions because of good community education et cetera. We like the *Oxford Dictionary* definition that says 'energy fuelled in ways that do not use up natural resources or harm the environment'. We just qualify. Clearly we do not deplete any resources and we are beneficial to the environment.

I will flick through this. The slide talks about the link between fossil fuels and crude oils and our produced fuel. Obviously we are diverting large amounts of plastics away from landfill each year — about 6800 tonnes a year away from landfill. I think we can just about finish with the slides. As I mentioned Ozmotech approaches the inquiry from a from a slightly unique position inasmuch as we are not a producer of biofuels or ethanols. We are a Melbourne-based, wholly Australian-owned company. In fact, I have been there that long that I thought up the company name and designed the logo. Our chairman was a client of mine and briefed me to write the original marketing strategy. Unlike many alternative fuel production, Thermofuel is a fully operational and proven system. We have an aggressive research program. The first plant, as I mentioned, is under installation in Ireland as we speak. Our interest therefore today lies not specifically in targets as in the terms of reference, but in definition.

I would like to state early in the submission that our prime objective is for all governments, particularly the Federal Government, to broaden their definition of alternative fuels to include those produced from waste or other methods that do not impose on or deplete the earth's natural resources. I have left a copy of this for Hansard, so perhaps it is not necessary to read out the whole thing. Naturally we recognise that state governments can only play an influence role in federal matters, but the industry needs to garner as much support from as many quarters as possible to support the continued research and effective and viable operations of a variety of new energies.

We note that the AFE's submission a year ago to the Environment and Natural Resources Committee sought actions, including state government support for changing the fuel excise regimes to appropriately recognise the value of biodiesel to the Australian community as a cost-effective, environmentally benign local fuel source, but that excise concession was already in place and was in fact in place at that time. It was embedded in the fuel excise act of 2006 but was in place at that time. Similar concessions apply to ethanol and surprisingly to LPG because it is a depletable fossil fuel resource. However, regardless of the broad environmental benefits attached to the production of fuels, our fuel and others from waste are not considered alternative and therefore continue to incur the full 38.143 cents per litre.

Whilst we acknowledge and support the ideals of the act itself and the production of biofuels as a method of deferring the demand on limited fossil fuel resources, we continue to be very frustrated that fuel from a waste resource, namely plastic, does not receive the same consideration. This is despite each system diverting almost 6800 tonnes of plastics away from landfill each year. Members of the Committee may know that in 2004 Victoria recycled almost 95 000 tonnes of waste plastics. Having five Thermofuel plants in Victoria alone would divert an additional 30 000 tonnes of waste plastics away from landfill. We in fact do not impose on the existing recycling stream because we take a lower value plastics — commingle, more contaminate. We would therefore under the first terms of reference seek that the Committee recommend that fuel produced from defined waste be recognised as an alternative fuel and be included in the mandated targets that this Committee is considering. We also seek that the government have a procedure in place to sympathetically review new waste-to-fuel projects that deliver environmental benefits to the community and have the effect of deferring the demand for depletion of fossil fuels. By definition, interestingly enough, because the CSIRO has just received $56 million from the Federal Government

for coal-to-fuel research as the development of an alternative fuel, I have to say our company struggles with that position.

If we can move down the slide perhaps: we would request that the Committee recommend the establishment of a set of guidelines for which alternative fuels are defined as: a renewable feedstock as mentioned before, as a virtually inexhaustible supply that does not deplete the earth's natural resources; that imposes no environmental burden; are, by definition, non-depleting; offer a negative environmental impact or extend the life of fossil fuel resources; and waste destined for landfill would qualify under all those criteria. It is not sufficient however, that fuel produced from a feedstock should automatically be included. It will be a further requirement that production and use of the fuel could deliver at a minimum similar emissions either greenhouse gas or potential toxic gases, to common fuel. We would like to tender into evidence, as I have done this morning, a recent submission made by us to the Federal Department of Environment and Water Resources, which shows the benefits I have outlined.

Finally we would encourage the Committee to recommend a range of tangible support mechanisms to encourage continued development of the product and waste-to-energy industries. They would include: formally recognise fuels produced from waste resources as 'alternative' and advise and strongly encourage the Federal Government to follow suit; unequivocal support for parity of alternative fuels offering the defined benefits; mandating of alternative fuel use in government vehicles; fast tracking of approvals; and continued research through ETIS and other schemes. I might put the formal part aside.

We have got about $300 million worth of orders all around the world, yet we cannot put one in our own backyard. We are embarrassed and frustrated to the point of distraction whereby we are unable to bring clients to Australia to see a plant working, to our own facility. Our R and D program is difficult when the only major full operating plant we have got is in Ireland and the next 10 that we build are all going overseas. In fact the next 30 we have got on order are all going overseas.

When the Federal Government wrote to us in 2005 saying there was to be a review of excise, we had in place a contract with a company called Axiom, and I believe Axiom has been here. It just killed the deal because that 38 cents was not factored into the costing. Axiom had done all of its appropriate due diligence; it had checked and confirmed with the ATO that the excise ruling was valid and it would enjoy that ruling. That was changed three days before it was due to float, having already collected $38 million, which it was forced to return to investors. Our $90 million contract with Axiom and every other person we have been discussing it with in Australia was put on hold. We have not moved a foot forward with the Federal Government since. We are looking for as much support as we can. Again, as I mentioned, we really try not to be company-centric here — the entire industry would suffer from the same response because unless it is on the list as an alternative fuel, there is no avenue for claiming excise concessions within the current structure of the act. Having said that, I am more than happy now to answer any questions or have a discussion.

The CHAIR — In the absence of us introducing a private member's bill in the Federal Parliament, we had better get on to what we can do here in Victoria.

Mr CRISP — But we can write a line in the report serving it up to our federal colleagues.

The CHAIR — I am interested very much if there is any recommendation you would make in relation to Victoria and how from a Victorian perspective we could assist in the development of the alternative fuel industries.

Mr MIDDLETON — That is a difficult issue because we do not want to appear to be coming to the government and saying, 'Give us grants or money'. We already are enjoying very good research assistance through the ETIS grant. Between ETIS and the Federal Government we have got about $2 million worth of research grants, as at today, and we have got more in the pipeline — things like being able to offset, if we are unable to achieve any excise concessions. It all comes back to a definition of 'an alternative fuel'. That is the crucial aspect, because once a nomination of alternative fuel goes through, then we would expect to receive the same excise concessions. In the short-term we would think that some financial support would allow offsetting the cost of the excise, which would then allow us to put a plant here. Certainly in the short term, for us to be able to put a plant here, even if it was just one, let alone the commercial aspects of it and being able to put them in regions. It only needs 100 000 people to justify a plant. So Wodonga would justify one, Geelong would justify one, Ballarat and Bendigo would all justify an operating plant within their region. If we were to receive some level of support, bearing in mind it was only a week ago that we knew we would be appearing so we have not had the opportunity to really sit down and work out

some long-term costings or what assistance would do us best. I will hearken back to the notes. I would like to come back to you on that. I will go away and we will do some costings within our company to see what aspects we can consider.

The CHAIR — You are saying 100 000 people would generate enough plastics to justify a plant?

Mr MIDDLETON — Yes.

The CHAIR — And would they consume the fuel that you produced?

Mr MIDDLETON — Easily, yes.

The CHAIR — They would?

Mr MIDDLETON — In fact a plant would not take all of their plastics waste stream. A city like Bendigo would generate far in excess of what a single plant would take. A small plant for Bendigo would be 10 tonne-3400 tonnes of plastics a year. Bendigo is already very sophisticated in its segregation recycling processes so the plastics would be of good quality for our process — apart from what the Visys or ANCORs or Veolias of the world are already handling. What is now going to landfill would still be well in excess of what we would require. So those cities would easily justify a plant operating in their own community.

Mr CRISP — Just as an estimate, what would a plant be in dollar terms?

Mr MIDDLETON — A 20-tonne plant, including infrastructure, is about $12 million. The plant itself is about 10. You need land; you do not in fact need a building, you can put it outside — it is quite happy outside.

The CHAIR — Do you want another question to tease this out a bit more?

Mr THORNLEY — I want to actually understand the economics of it — completely understand the case on the excise. I think, looking around the table, we would like to help in any way we can on that, so let us take that as read. What are the underlying economics of your fuel production — what sort of fuel cost comes out at the end?

Mr MIDDLETON — Obviously a lot will depend on circumstances, but primarily it depends on the quality of feedstock that is coming through. This does not allow for a commercial return to the client. I only know the costing of the plant from a pure plant point of view — that is from Ozmotech's point of view. I am not considering cost of money, I am not considering the infrastructure required to support the building and the plant et cetera. From the plant itself you could expect a cost of around 45 to 55 cents per litre.

Mr THORNLEY — That is the variable cost?

Mr MIDDLETON — That is the variable cost. Then on top of that you have got your cost of money, you have got your building — —

Mr THORNLEY — You have got your capital costs, yes.

Mr MIDDLETON — You have to make profit. In fact in Axiom's prospectus they allowed for a selling price of $1.03 — I can make mention of that here because that prospectus is in the public domain. My recollection is that they allowed for a selling price of $1.03, which allowed them all of their production costs, all of their cost of money, infrastructure, land et cetera, and profit. They were going to sell the fuel at $1.03. But again, that was two years ago.

Mr CRISP — How much money has gone into the business so far and how has it been funded?

Mr MIDDLETON — Privately funded by the directors. I would expect the current investment to be around $20 million, for which we have got orders now, but again none for Australia.

Mr CRISP — Would you be manufacturing the plant here?

Mr MIDDLETON — Yes. Well, the current plant was manufactured here; it was made out at Sunshine.

It would be true to say that if we are not able to put in any plants here in Australia and not able to access our own equipment for research and for sales and marketing activities and just for having one close by, there is no doubt, I feel, that the company would consider alternatives. I have done costings on it as well within the company on manufacturing overseas and running our entire company.

We have just written a new marketing strategy and a new business plan whereby we are considering a new company based in the United Kingdom and handling all of Europe in the medium term. If we do not have any here, having all the operations under that umbrella would be appealing to the company, I think, because we just need access to one of our own. We cannot put another $12 million in just to put one up so we can bring people in from all over the world and say, 'Look what we can do' and so our research scientist can go out there once a week and run tests and all that. It is just not feasible. That break-even point is the excise. Without it, it is a viable proposition. We have clients with chequebooks at the ready, literally in their back pockets, saying, 'When you get this issue resolved, we will buy one'. There will be one going to Perth, there will two going to Adelaide and I am not quite sure how many going to Sydney, but you can imagine the market there, through Waste Service NSW et cetera. But nobody will buy one while the current excise regime or the current alternative fuel definition stand as they are.

Mr CRISP — I just have a very quick technical question before you wrap up, Chair. Waxing is an issue with some diesel fuels. It was not in your technical specs.

Mr MIDDLETON — No, waxing is addressed by pour point depressants, PPDs, which are additives. Everybody uses them — Caltex uses them, Shell uses them. That addresses waxing, it addresses cold filter plugging points, pour points, all of that. They are environment-specific, so we down in Melbourne have different ones to people in Brisbane. No, waxing and repolymerisation is not an issue for us. It is, I believe, an issue for biodiesels. I am not quite certain on that, but I think.

The CHAIR — Is there a particular industry that is more interested in using this type of diesel than any other?

Mr MIDDLETON — We would think that companies like bus companies et cetera would find it appealing. There is a bus that literally drives past my office window with a sign saying 'The first bus running on hydrogen'. There would be a great deal of appeal for buses to be running down the street saying, 'This bus is running on fuel made from waste plastics'. There are enormous promotional and marketing benefits to be gained from that. Unlike hydrogen et cetera, there is no proofing required. Because the fuel is standards compliant, there are no engine warranty issues. As long as the fuel complies with standards, warranties remain valid and in force, and quite rightly so. Unlike biodiesel you can use this 100 per cent neat. It is straight out of the machine and into your diesel tank.

Mr THORNLEY — What is the relationship, then, with the landfill operators?

Mr MIDDLETON — Supportive. We have a good working relationship with — —

Mr THORNLEY — Do they pay you to take feedstock off them or how do the economics work?

Mr MIDDLETON — No, there is a transition of costing of plastics happening right now. The third partner in the Axiom deal was Visy. Visy and Axiom had a contract for Visy to supply Axiom with plastics at a rate — I do not know what it was. There is still a large amount of plastics available. In fact our client in Ireland is putting through agricultural plastics, and it is being paid to take them away. So they in fact do not have an excise issue, because that is offset by the fact that they are getting a gate fee. In most other countries there is a limited value, a small value, to the plastics. It is not a recycle value, so it is not around $600 a tonne or $700 a tonne like PET is, because it is a low-value plastic. That will change over the years, but at the same time the increase in the cost of diesel fuel or the selling price of diesel fuel will offset that. In two years diesel fuel may be $1.40, and that will offset some of the costs of the feedstocks.

The CHAIR — Could I have the last question in relation to gas emissions — comparing that with emissions associated with conventional plastic recycling? One of the overheads outlined some of that, from memory.

Mr MIDDLETON — Yes.

The CHAIR — Could you refer to the relevant part in the relevant document and take us through that in a little more detail, please?

Mr MIDDLETON — It is in the printed document that I handed out this morning. On page 5 table 2 is a reduction of the key pollutant emissions against fossil diesel, as a percentage. You will see table 1 puts them out in figures. Of carbon monoxide, if fossil diesel is rated as a 1, then the level of carbon monoxide produced by an engine running on ThermoFuel is 0.2 — so it is about 20 per cent of the carbon monoxide emissions of fossil fuels. Biodiesel's is about half. Again, if I can just make some allowance here, this is dependent on the type of feedstock, plastics that have been put into the plant and also the type of feedstock that is used to produce the biodiesel, so you get different levels with canola, with tallows and fats et cetera. But as a broad average, NO_2 — nitrous oxides — if fossil diesel is also rated a 1, biodiesels in excess of that; they are 1.13. Waste plastics to diesel fuel is 0.86, so that is only 86 per cent — that is for 100 per cent polyethylene. And for particulates, which is smoke, soot coming out of the exhaust pipe, again if fossil fuel is rated as a 1, ThermoFuel — because it is cleaned as it comes through the process; and also starts out from a relatively clean feedstock source; whilst it might have contaminants in it, those contaminants are removed, and that is leaving a very clean basically hydrocarbon-based product as a feedstock — particulates et cetera are 0.06, as against biodiesel's 0.7 and fossil fuel's 1.0. So it is about a 40 per cent advantage with particulates.

The CHAIR — Thank you very much. We have got permission to put these tables in the transcript, which will help make sense when it is put on the internet.

Mr DAVIS — Have we got the source document for this table?

Mr MIDDLETON — Not as part of this, but I would be happy to provide it.

Mr DAVIS — That would be good.

The CHAIR — That concludes this session of evidence. On behalf of the Committee, I want to thank you, Mr Middleton, very much for not only the evidence but the documentation accompanying it, which has assisted one and all to understand your work. You will be provided with a copy of the transcript within about a fortnight. Feel free to correct any typographical errors. I would think because of the scientific names that were used it would be handy to have an email contact, because what is second knowledge to you is not to the rest of us. Thank you very much.

Mr MIDDLETON — Thank you.

Witness withdrew.