STATES OF JERSEY

SCRUTINY COMMITTEE

BLAMPIED ROOM, STATES BUILDING

WASTE MANAGEMENT STRATEGY

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Present: **Deputy Phil Rondel (Review Chairman)**
Senator Ted Vibert
Senator Jean Le Maistre
Deputy Rob Duhamel
Deputy Bob Hill
Deputy Gerard Baudains

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QUESTIONS AND ANSWER SESSION FOLLOWING PRESENTATION BY MR NICK DAWBER (ENERGOS ASA)

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on

Monday, 7th February 2005

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DEPUTY RONDEL: Before we start, I have to read to you the following because there will be questions and answers once you have given your presentation. Although the presentation will not be recorded, when we get to the questions and answers, they will. It is important that you fully understand the conditions under which you are appearing at this hearing. You will find a printed copy of the statement that I am about to read to you on the table in front of you.

Shadow Scrutiny Panels have been established by the States to create opportunities for training States Members and Officers in developing new skills in advance of the proposed changes of government. During the shadow period, the Panel has no statutory powers and the proceedings at public hearings are not covered by Parliamentary privilege. This means that anyone participating, whether a Panel Member or a person giving evidence, is not protected from being sued or prosecuted for anything said during hearings. The Panel would like you to bear this in mind when answering the questions and to ensure that you understand that you are fully responsible for any comments that you make. Thank you. If you could give us details of yourself and your company, please, Sir, and then the presentation, which will not be taped.

MR DAWBER: Thank you, Senators and Deputies. My name is Nick Dawber and I am responsible for the Energos Division, which is part of the Ener-G Group. I am Managing Director of that company. What I would like to do is just to give you a brief summary of the Ener-G Group, so that you have got an understanding of not just the Energos technology but what is behind that, and then I will move on to the Energos technology and concentrate more on the Energos plant and its track record.

Mr Dawber gave his presentation

DEPUTY RONDEL: I would like to thank you for the presentation. Given the time constraint, we will go straight into questions. Given that we need these questions on record, although you have given us the presentation, with some of them obviously you will already have given us the answer. Could you tell me, please, how many plants do you have in Europe that fit the "two-plus-two" criteria, that is more than two plants operating and also they have operated for more than two years?

MR DAWBER: There are now six operating plants, one in Germany and five in Norway, all of

which have been in operation over two years and all of which … well some go back to 1997, but the oldest working large full size plant has been in operation since 2000.

DEPUTY RONDEL: Thank you. Could you give me, please, the volumes … now, prior to that the size of the plants -- you showed us some of the plants on the screen -- i.e., in relation to population and volumes of waste that go into those plants?

MR DAWBER: The size of the plants … you have seen the line modular plant is capable of taking 40,000 tonnes per annum of waste through it. That would allow a community the size of 100,000 to dispose of its waste through a single line 40,000 tonne plant, as is done in the Christensen region. In the Stavanger region there is a population of 250,000. There is a high degree of recycling being undertaken and, consequently, the amount of waste that actually goes through the plant is 40,000 tonnes per annum.

DEPUTY RONDEL: Thank you. Deputy Duhamel?

DEPUTY DUHAMEL: Yes. If the community ended up producing substantially less in capacity of waste that is capable of being processed by a single line plant, would your plants in fact be able to still process the waste by running for, say, shorter periods?

MR DAWBER: Yes. I mean, the plants will go down to less than 30,000 and down to 20,000 tonnes per annum if necessary. What happens as a consequence of that, of course, is that efficiencies in the process are effected, but it can still process it and the end result of low carbon ash and very good emissions is still achieved. It is just obviously the issue of the economics.

DEPUTY DUHAMEL: A second question if I may. You indicated that above a capacity of 10MW the process can go towards electricity generation with low risk and it was preferable to combine heat generation and to put it into a system to heat houses and things like that. Could you actually perhaps give an indication of the pipe distances between the plant and the customer for the combined heat and power and what would be an upper limit as to how economic it would be to provide that pipework?

MR DAWBER: I probably can't give you a detailed answer to that one, I'm afraid. My apologies for that, but the distance that the heat can be transferred could be significant. It really is dependent on the costs incurred, the pumping cost, the height difference between the plant and

where the customers are and the route which the pipeline takes. I think in the Stavanger region the pipeline itself, which is operated by the energy company as opposed to the plant, is in the region of 2km, but that is only my own estimate. My apologies for not being able to give you a definitive answer on that.

In my experience, the ability to transfer heat allows you to go quite some distance. It is all very much the cost, the infrastructure cost issue, and then the amount of energy that is consumed in pumping the hot water round the system. But, for instance, in Poland there are district heating schemes that are several kilometres long in terms of their distribution process. There are four, five or six kilometres from where the heat is generated to where the customer is based. So it can be done. It is a question of the economics and having a look at that specifically. Clearly the most effective way of recovering the energy is to use it directly to provide heating either in the form of steam or in the form of hot water.

DEPUTY DUHAMEL: Have you any indication as to the relative costs of providing the infrastructure compared to the cost of providing the plant?

MR DAWBER: Unfortunately I don't, because that area is generally undertaken by the customers. Our scope of supply would normally be to provide the plant and the interconnections with their distribution system rather than to put the initial infrastructure in required for heating. That is our area of speciality. Again, distribution of waste or district heating schemes are very much dependent on what the issues are, in terms of where you are going to put the pipelines. Is it going to be under roads; is it going to be in grass verges alongside the roads; is it going to be overground; is it going to be underground? There are so many different connotations of how you deliver that energy that it would be difficult to give you an estimate, I am afraid.

DEPUTY DUHAMEL: So would it be fair then to assume that, for a community that hadn't invested in the infrastructure pipework to provide for a combined heating and power system, that would tend to push any solution towards having a plant fairly closely located to the customer?

MR DAWBER: If you were looking at heating in the city, the customers in the city, then my first opinion would be that it would probably be unlikely to be economic because of the small scale, the small number of lots of different customers and the interruption that it would cause in terms

of installation around the city. If you can find a customer, such as an agricultural use, greenhouses or an industrial steam consumer, then they are the more ideal type of customer.

DEPUTY DUHAMEL: Okay. Thank you.

DEPUTY RONDEL: Deputy Hill?

DEPUTY HILL: Can you give us some indication of the type of waste your machine or your facility would be able to cater for widespread? I am sure it would take a fair bit.

MR DAWBER: The only difference between ourselves and a mass burn incinerator would be that we would prefer not to have large amounts of steel in the process because that would interfere with the transport system on the grate. Under normal circumstances, we would remove … we would take black bag waste and we would put it through a shredder and then through a magnet system, recover the metals or the steel and then put the rest of it through the process. So, as long as we are not taking in … as long as we can prepare the fuel to approximately 50mm by 25cm, it is the height of the bed that is on the grate that is important to us, then we can handle it. So as long as it can be shredded it can be put through.

DEPUTY HILL: Could I include, for the want of it, animals, carcasses?

MR DAWBER: You could.

DEPUTY HILL: Hospital waste?

MR DAWBER: You could. The waste that you would … you would want to limit the moisture content to about 60%, so you could put liquid wastes and mix liquid wastes into the waste stream or inject it into the grate above the grate. So there area number of different things you can do and it can handle that. The moisture actually has a positive effect on the use of lime. It will actually reduce the lime consumption in the process. So it has some added benefits, but it does also have a slightly negative effect in terms of the energy produced, because part of the energy that is produced is then used to convert the water into steam. So, consequently, it will reduce the energy recovery element, but it can have some financial benefits in terms of lime consumption.

DEPUTY HILL: Thank you.

DEPUTY RONDEL: Getting back to the presentation, you gave figures or showed figures on bottom ash and fly ash. Could you give those figures out for the record, please?

MR DAWBER: For the fly ash production of general municipal solid waste, it is generally around about 3-3.5% of the waste going into the process. In a typical plant burning 39,000 tonnes of waste in a year, the fly ash … the amount of lime and carbon put into the process would be approximately 800 tonnes and 3.5% of the waste going in would come out in the form of fly ash. I can give you the exact figure. (**Pause**) So approximately 1,360 tonnes per annum. Clearly what dictates the amount of fly ash that is produced is the amount of lime that is used, and that is dependent very much on the waste stream going in, so this is typical for a municipal solid waste. If you have a commercial waste that has a higher chlorine content, then the amount of ash produced would be higher, but this is typical for a municipal solid waste.

DEPUTY RONDEL: And give the figures also, please, for bottom ash?

MR DAWBER: Bottom ash, typically 15% of the waste going in. If the waste does contain ash already, then that ash will also pass through and come out in the same form as it went in.

DEPUTY RONDEL: Thank you. Deputy Duhamel?

DEPUTY DUHAMEL: Yes. You indicated that if the system was running according to the European Directives for emissions and running, therefore, very clean, it wouldn't be particularly economic and fly ash production at those levels would be expensive. Could you actually amplify a little bit on those comments as to what would be the normal operating conditions and thereby under which you would ----

MR DAWBER: In terms of the chlorine and fluorine levels, you would tend to be in the region of probably 40% under normal operating conditions for a reasonable lime consumption. The NOx and the carbon monoxide are not affected by lime consumption. They don't … the formation of carbon monoxide and NOx is not dealt with by the filter system. That is purely a combustion control system and those levels of CO and NOx can be achieved for a considerable part or most of the time. We would tend to operate the plant generally. You can see the NOx on this plant was 78. We would tend to operate at around 100 to 120 under normal conditions.

DEPUTY DUHAMEL: And an additional one, if I may. Would your system, I think you indicated that it would run on refuse derived fuels.

MR DAWBER: Yes, it would.

DEPUTY DUHAMEL: Is there any indication that your system is actually better run with a prepared fuel rather than running on ordinary MSW?

MR DAWBER: It is a question of economics because there is a cost of preparing a fuel in an RDF plant. If the primary reason is to do recycling and take out the recyclate that is useful, then you can end up with … that cost is incurred anyway, but in order to put a plant in just to prepare an RDF, where the market for recyclates isn't necessarily there, then I would say that there was no financial benefit in preparing an RDF. The plant will run probably slightly more reliably with a better prepared fuel because the transport mechanism will be less susceptible to damage. Occasionally if you get steel, larger chunks of steel, going through it, then it can cause some damage to the transport system, which invariably would have to be repaired. The system has been designed to replace it relatively quickly and minimise down time, but there is … you know, large chunks of metal are not favoured, but it can take it. If you look at the Sarpsborg plant, you can see lots of cans and steel going through the process because the delivery of waste or delivery of waste fuel in that particular case is done off-site and obviously their magnetic removal system is not very good. The process survives no problem in that respect, but clearly the more refined the RDF is, then that is going to have a positive impact on future reliability. It is a question of what is economic.

DEPUTY DUHAMEL: Okay. Thank you.

DEPUTY RONDEL: Senator Le Maistre?

SENATOR LE MAISTRE: Actually following on from that, what link do the operations that you have described have with the collection systems operating? Is that an integrated system with yourselves or is it private contractors working with the local authorities?

MR DAWBER: Generally, I mean, our purpose is to provide the facility to the waste management or the local authority. Generally it is fitted in within an integrated system. So if you take the Forus plant, that is owned by the local energy company and the local waste management company and combined the waste management company has a recycling process or an integrated solution, so a lot of the organic waste and a lot of the plastics and papers are removed at source and recycled separately. So what comes into the plant is purely … is just that

waste that isn't recycled. But it depends on the discipline of the person who is producing the waste as to what they put into their bins. Some of the outlying communities in the Stavanger region are not recycling and that is pure black bag waste that is coming into the process. So fitted in with a source separation process, then it reduces the amount of waste that is collected and delivered to the plant in the first instance. If you take another option, which is to have a materials recycling facility, like they do on the Isle of Wight, where there is a high degree of recycling going on and then there is the RDF production, then you can take the waste into the prepared waste.

SENATOR LE MAISTRE: For comparison purposes, do you know what percentage it is in the Isle of Wight, for example, that is recycled from the total?

MR DAWBER: Looking at the island, I would say probably in the region of 20% to 30% of the waste coming into the recycling process is sent for combustion.

SENATOR LE MAISTRE: Right, so 70% is recycled?

MR DAWBER: Yes. Biffa at the moment are achieving over 50% recycling in the island, yes, but not all of it would go into … only 30,000 tonnes per year would go into the combustion plant on the island. Forus are taking 40,000 tonnes from a population of 250,000 people, and I would expect a waste arisings in the region of 120,000 tonnes, so, again, there is only 30% to 40% of the waste going into the plant at Forus.

SENATOR LE MAISTRE: Would you accept that when the level of material coming in is close to the 40,000 tonne maximum, that it would be a wise precaution to have a two stream plant to take account of down time? At what point then is it necessary to have a second stream to accommodate down time? Is it at 30,000 or 35,000 tonnes? At what point is it suggested that it should be a two stream plant?

MR DAWBER: On the mainland clearly the issue is not as critical because there are alternative disposal routes, so it is much more critical on an island where there is no solution.

SENATOR LE MAISTRE: Yes.

MR DAWBER: There is no alternative really. Again, it is a question of the economics and where you see the possibility of improving recycling, but I would … it is a difficult one to answer that. It is very much an economic question. I would recommend that, if you have got a peak of waste

coming in in the summer time, where it is probably difficult to achieve recycling with the holidaymakers and the tourists coming in -- they are probably not likely to respond to any initiatives -- therefore you are going to have peaks and, therefore, a double line plant would probably be the initial ----

SENATOR LE MAISTRE: Safe bet.

MR DAWBER: Safe bet so that you have got some built in availability in the event that one of the lines is shut down for maintenance and then you have also got the benefit in the winter time where you can shut down one of the plants if it is not necessary to operate it. So there are some benefits there. The question is whether you would need to go for a third line plant, a third line, but that decision can be taken in a fairly relaxed manner, having assessed all of the alternatives.

SENATOR LE MAISTRE: Okay, thank you.

DEPUTY RONDEL: Deputy Baudains?

DEPUTY BAUDAINS: Thank you. Yes, in an island like Jersey, where we don't have a long list of alternatives for getting rid of our waste, clearly reliability is a major factor.

MR DAWBER: Yes.

DEPUTY BAUDAINS: When you talk about dual line plants, what exactly is duplicated, clearly not the entire plant?

MR DAWBER: No.

DEPUTY BAUDAINS: Is it mainly the primary and secondary chambers, or are there other parts as well?

MR DAWBER: The primary and secondary chamber and the boiler, so the common system would be the steam system, so the steam production would be affected. It would have an impact on the efficiency of the steam turbine, so it wouldn't be as efficient when operating at half load than it would be otherwise because it was designed for the correct normal operating conditions to maximise the conversion efficiency. So there will be some loss there, but, in terms I would say that the main aim here is not efficiency of the cycle but efficiency of the ability to process the waste and to continue to process the waste. So they are completely independent in respect to the actual waste treatment process.

DEPUTY RONDEL: Okay, I will put two final questions, if I may. The chimney height and

also whether water vapour is emitted from the chimney?

MR DAWBER: Okay. The chimney height is very much dependent on the local emissions. Now, it would be my best guess here that there is no issue in terms of emissions in the locality, so 35 metres, under normal circumstances, would be acceptable in an environment where the local air quality is good. If we were looking at somewhere in the UK near a high or poor environmental area, then the height capacity would have to alter, but what we would undertake in those circumstances is a model, a discussion model, and that would look at the background and then we would take the height in the normal way that you would do that when assessing a project, but my expectations are that 35 to 40 metres would be more than acceptable in this environment.

DEPUTY RONDEL: And the water vapour?

MR DAWBER: Water vapour, I wouldn't expect it under normal conditions. You may get very cold climatic conditions which may allow the natural moisture of the water content in the waste to condense, but, under normal circumstances, you wouldn't have a plume. It is very rare that a plume is seen. That is because we don't use … we have a dry flue-gas cleaning system, so we are not also producing the sludges and incurring the costs of operating a urea injection system that a normal mass burn incinerator would require to meet the EU NOx emissions.

DEPUTY RONDEL: I would like to thank you because our time is up and we have a full load this morning, full work load. On behalf of the Panel, thank you for giving us your time.

MR DAWBER: Thank you.

SENATOR LE MAISTRE: Thank you very much.

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