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
In attendance:	**Professor Chris Coggins (Waste Management Consultant)**
	Professor Jim Swithinbank (Sheffield University)

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EVIDENCE FROM:

DR ANTHONY HADEN-TAYLOR
(Recycled Refuse International)

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on

Monday, 18th October 2004

(09:30:42 - 11:02:03)

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DEPUTY RONDEL: I will just introduce the Panel to you.

(**Senator Le Maistre, Professor Swithinbank, Senator Vibert, Carol Le Quesne, Deputy Rondel, Deputy Duhamel, Professor Coggins and Deputy Hill were introduced to Dr Haden-Taylor.**)

DEPUTY RONDEL: I have to read to you … it is Dr Haden-Taylor, isn't it?

DR HADEN-TAYLOR: That is right.

DEPUTY RONDEL: I have to read you the following statement and you will find a note in front of you. 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.

DR HADEN-TAYLOR: Thank you very much.

DEPUTY RONDEL: You have obviously submitted a submission, an extensive submission. Would you, please, like to give details of that submission to the Panel and I would like to put, shall we say, a 15 minute period on your submission and then we will take questions from the Members. If you would like to start?

DR HADEN-TAYLOR: Thank you. Thank you, Deputy. The submission that I made was really in response to the advertisement which required at least some suggestions and to put some alternative technologies that might be available, that incineration is not the end and there are others, some of which are tried and some of which are tested. I went through a range of different technologies in fact, having taken an overview of Jersey, looking at its particular needs and its limitations and constraints. Then I looked further at the British example, which I think we all have to do really because we follow England very largely, or at least England follows Europe, so

we have to follow Europe if we can.

So, in that context, I looked at the different waste arisings and the technologies and the disposal methods and, as we know, only 97½% of waste in the United Kingdom is actually landfilled and only 2½%, approximately 2½ million tonnes, is actually incinerated through 11 incinerators. There are some more … there has been … for the last 10 or 12 years there has been virtually no incinerators being passed, but there are one or two now emerging largely, I suspect, because there is a huge pressure on land take and on the fact that, apparently, 85% of the population of the United Kingdom lives within 3km of a landfill and so I think there are some health issues, perceived health issues, about landfills.

So I looked at that and then I looked at the various technologies, and there are a range. I didn't include ours, because I thought it was inappropriate to actually be batting for one's own team. So I only looked at the other technologies that exist. Since then, I think Thermoselect, which is a pyrolysis/gasification process based in Karlsruhe, has now, on its third warning, been closed down completely at a cost of €430 million, and that is because of its failure to comply with emissions within the European Union and, more particularly, the Waste Incinerator Directive.

So, given that, we then looked at an overview as to what perhaps we could achieve, because I have seen various documents about, you know, waste minimisation, waste recycling, composting and so forth which may be appropriate for Jersey. I don't think some of the experts realise, some of the people in flats in Jersey, as to where they are going to put their compost heaps, but there are some amusing thoughts about that. Certainly there is a need to rationalise the collection system. The parish based system has its inefficiencies. It also has its costs savings because a lot of the equipment is actually second hand and well cared for and kept on the road at a very low cost. I suspect that if we had a state-wide collection system, it would cost more money and the equipment would cost a lot more, but it would have a number of greater efficiencies. Whether the public would see that I don't know, but there certainly would be some efficiencies.

There are some issues about the restrictive covenant over Bellozanne. Clearly that is

going to make it very difficult to find a payment mechanism that is going to work. There has got to be some form of gate fee for any technology, and whether that gate fee is borne by the States or borne collectively by the parishes is a moot point. The polluter pays, that is the principle in Europe, and I suspect, therefore, that waste generators, whether they be restaurants, supermarkets or factories, or even farmers, they all generate waste and, therefore, they must make a contribution towards disposing of that waste.

I think the incinerator has its merits. They are certainly a lot cleaner and a lot more efficient than they were. However, there is a large cost associated with keeping those emissions clean. The stack cleaning equipment represents more than 50% of the operating cost of an incinerator and the figure that has been banded around at the moment of sort of £30 or £40 a tonne to operate the proposed incinerator is wildly off the mark. I think experts in this room will probably confirm that they will be substantially greater than that.

Also, the downside is that, even if there is going to be a pre-sorting of waste associated with an incinerator, that waste, all the recyclables or the recoverables, are going to be dirty. We have a direct example in the United Kingdom that the aluminium from a can bank, like an aluminium can, would generate £175 a tonne. Aluminium from the process that we are promoting is £960 a tonne and we have a contract with British Alcan which actually demonstrates that. The same with Corus, where dirty steel, which may have baked beans and labels and so on, where someone has helpfully put a banana skin inside as well, probably has almost zero value, when in fact, with world pressures on commodities, we are achieving close to £170 a tonne for clean steel.

That in reality, if we translate that to Jersey, is approximately £2 million of real money that currently is not being recovered. In fact, Bellozanne admit that I think they recycle about 15 tonnes of metals out of several thousand. The plastics are 3½ thousand, 3,540 tonnes, of plastics at the moment. Those are all being incinerated. There are capabilities for recovery. We make roofing tiles out of PET and brown glass in Barbados. We make all sorts of other recyclables. We are also using a reversed depolymerisation process, which can actually extract at a rate of 90% diesel fuel directly from plastics. So there is absolutely no reason, in my view, that 3,500

tonnes of plastics should be incinerated. It is an easy way to sweep it under the table and say "Let's get rid of them that way", but there are a number of processes which can use plastics very successfully.

I think there is also the fact that we are shipping out between 50 and 100 tonnes a week of shredded wood, which is costing the States nearly half a million pounds. Clearly that is, you know, being slid through some budget and it is wholly unjustifiable. We are having to pay for back loads by trucks. They are taken all the way to the other side of Manchester, where, you know, we could actually bring in a small board plant and we could actually produce some employment and produce 3,000 tonnes of board a year from this timber. Instead, we are paying half a million pounds to get rid of timber where we could use the same very half a million pounds to subsidise a board manufacturing operation that will be certainly satisfactory for what we need.

So there are many issues that I think have not been addressed by Babtie Fichtner. I think that the quality of their report has a substantial amount of "wordprocessoriritis" about it. It has been sort of generated. It is probably more appropriate to Wigan than it is to Jersey. A lot of the statements are very generic and they are not apposite to Jersey, in my view. Similarly, I think the cost associated with that report, which are something like £975,000, is a huge amount of money for something which in fact I am sure experts around this room -- and I know two of them, or I have met two of them -- would be very happy to do for half the price or even a quarter of the price and with exactly the same quality. So I think there has been an unjustifiable waste associated with that.

I have to say that Babtie Fichtner have in the past been expounders of incineration. They have not noticeably been expounders of any other technology and they have not in the last five years, as far as I am aware, actually been successful in placing an incinerator anywhere else in the world. So we do have some concerns that there is a very narrow view being taken of the incinerator technology by people who tend to be substantially incinerator orientated people. I think it is refreshing to see other experts at your Panel here who actually have a much, much broader church view of the technologies that are available, although some of them have some

reservations.

Just in summary, we have been very successful in operating our plant since 1999. The original prototype was 1994. In 1999 it was commissioned. It has operated continuously extracting the maximum amount of recyclables at the maximum grade A prices and producing a fibre which has until very recently been classified as an animal by-product largely associated with CJD, "Mad Cow Disease" and so forth because of the animal element, bones and flesh that might be within the MSW. Fortunately the Environment Agency and DEFRA (which is the Department of the Environment, Food and Rural Affairs) in the United Kingdom have spotted something in the statutory electricity generating instrument which says that any biodegradable element of municipal solid waste must be regarded as a biomass. Not only that, but because animal rendering is at 140 degrees and our process is 160 degrees, it therefore exceeds all animal rendering requirements and, therefore, renders the MSW as a biomass.

In that context, I am having further meetings with Environment Agency lawyers and Lord Whitty on 1st November at the Ministry of Environment. He is one of the Ministers of the Environment on 1st November. In fact, three days ago we signed a series of contracts in Thailand and Elliott Morley, the other Minister of the Environment -- there seems to be a lot of them -- was present by the invitation of the British Ambassador and the Prime Minister of Thailand in actually witnessing the sale and the signing of a number of contracts relating to energy from waste using our technology. In addition, we have been successful in winning tenders in Indonesia, South Africa and most recently the city of Tehran. We are actually handling or processing and under construction processed plants covering about 9 million tonnes of municipal waste.

This has been subject to huge scrutiny by other experts, by banks and by the World Bank. We have been asked by the World Bank to involve ourselves with the hurricane countries, Barbados, St Lucia, etc, etc, Grenada, relating to the problems associated with waste following Ivan. We are also supported by the World Bank in the Philippines, Laos, Cambodia, Vietnam, Thailand and China, where our technologies have been approved by the Ministry of Technology in China and the Ministry of the Environment in China. We have been invited to submit

submissions for Los Angeles, for 10.6 million tonnes, 5 million tonnes for St Diego and we are already on the approved list. So world-wide we have been very successful, remarkably more so than in the United Kingdom.

The reason why we are not successful in the United Kingdom, or up until now, is that Mrs Thatcher induced the local authorities to privatise their waste collection and disposal, as a consequence of which long term contracts between 25 and 30 years were entered into as justification for some form of capital expenditure that would be shouldered by private industry. Those contracts are not expiring until between 2006, 2007 and 2008. We are at the moment the preferred technology for seven local authorities in the United Kingdom, where we have in fact gone through various public tenders and we are at the stage now of working final contract drawings.

We have associated ourselves with Semcore, which is a Singapore Government owned major contracting company and waste collector and processor and they have an engineering division, projects management, called Simon-Carves based in Manchester. So we have a global delivery capability. We have an approved technology. It is no longer embryonic. It is using technology that has been around for 200 years. The only novelty is the fact that we are putting waste into an autoclave rather than baked beans or Heinz soup, which is normally where … and also hospitals use them for sterilisation.

So that is really where we are. Our report stands as it is and really I am here to answer any questions that might arise as a consequence of it.

DEPUTY RONDEL: Thank you very much, Dr Haden-Taylor. I will put the first question. If I could just reiterate something? Could you give me the dates that you are operating your plant in the UK, when you started operating?

DR HADEN-TAYLOR: The first one was in 1994 in Clatterbridge, which is near Sheffield. It is a suburb of Sheffield, isn't it?

PROFESSOR SWITHINBANK: I am not aware of that.

DR HADEN-TAYLOR: It is right adjacent to the incinerator. There is a waste plant there. It may not be exactly Clatterbridge, it may be something else.

DEPUTY RONDEL: And how many plants have you got in the United Kingdom?

DR HADEN-TAYLOR: And then we built another one in 1999 down at Davis Brothers, which is Bridge End, but we are not responsible for its management, but we are responsible for its underlying operation. The management are formerly waste landfill operators, so they have very much a different attitude of how things ought to be managed.

DEPUTY RONDEL: Right. What down time, if any, have any of your plants had since they have been in commission?

DR HADEN-TAYLOR: This one, the Davis Brothers' plant is in two parts. One is the autoclave operation which reduces the municipal waste, unsorted waste, down to fibre and clean recyclables. That has had very nearly a continuous operation until recently, when it has been dismantled because it is being upgraded because of a Bridge End contract which will increase the throughput to 350,000 tonnes from its present 60,000 to 80,000 tonnes. So that is being dismantled, but otherwise it has been continuous, pretty well continuously operated.

The gasification side is made by a company called Graveson Energy Management. That has been a disaster. We have disassociated ourselves from that technology because of the financial problems associated with that company. They are finding it very difficult to get it to work and, although it is a proven piece of technology in terms of gasification, which is the same as we use to make coal gas -- heating up coal in an oxygen-free environment releases a gas from the coal and that is called coal gas -- the same process when taking this homogenous fibre produces a synthesis gas and it is fairly well accepted.

We have gone more towards the technology that is being used by Slough Heat & Power, which has been "accepted" -- accepted in quotes/unquotes -- but in dialogue with Mr Bennie and Mr Richardson of PSD and also Babtie Fichtner that if we are to use that as the rear end, in other words for disposing of the fibre, then that would be an acceptable, proven technology which they would be prepared to accept. As a consequence, if we marry our technology, which is the autoclave, with other propriety technology for disposal of biomass … and there are 30 or 40 plants operating in Finland and at least 50 plants operating in Denmark built by Babcock Vøland. There are a substantial number of examples of very successfully taking biomass with

about 35% moisture and combusting it. Now, biomass is the waste wood, shredded wood and a variety of other things, particularly in Scandinavia, where they gasify and they use the steam for district heating and also for electricity generation. So there are probably 60 locations that we could take Members of the States to see this in operation in Scandinavia and those have been accepted by Babtie Fichtner, that if we are to go down that road, and it would certainly still come in under the budget that we described of circa 40 million, they would therefore find that … well, they couldn't dispute it and, therefore, it would be something which they would look at very seriously.

DEPUTY RONDEL: Thank you. Senator Vibert, could I ask you?

SENATOR VIBERT: Yes. Good morning.

DR HADEN-TAYLOR: Good morning.

SENATOR VIBERT: You are aware, of course, that the Scrutiny Panel is an evidenced based panel and is looking at confirmation of evidence given before the Panel to ensure that what we are told is in fact the facts. The first question I would like to ask you is whether you can produce to the Panel evidence, letters, contracts, heads of agreement with any of the countries with which you have signed up on all these projects?

DR HADEN-TAYLOR: Yes, I can.

SENATOR VIBERT: And can you tell us when you would be able to do that?

DR HADEN-TAYLOR: A matter of days.

SENATOR VIBERT: Right. Also, could I ask you what reference plants there are in the UK where we can actually refer to about the success or otherwise of the plants?

DR HADEN-TAYLOR: Well, as I said, the Davis Brothers' plant deals only with the autoclaving, the extraction of clean recyclables and the production of the biomass fibre. The best reference point for the disposal of the biomass is Slough Heat & Power at Slough, which is a 40 megawatt power station run using wood waste and biomass.

SENATOR VIBERT: Is that owned by your company or is that somebody totally separate?

DR HADEN-TAYLOR: No, it is totally separate, but it is tried and tested and approved technology.

SENATOR VIBERT: But do you own that technology or do you have any rights on that technology?

DR HADEN-TAYLOR: No, no, no we don't, but we have working relationships with Babcocks and with a number of other manufacturers, leading class manufacturers, who are happy to co-operate with us.

SENATOR VIBERT: Hmm hmm.

DR HADEN-TAYLOR: So we are packaging, if you like. We are producing our front end technology, but we are packaging the back end in at a price in order to give value for money to Jersey.

SENATOR VIBERT: So do I take it that what your company, so that I can understand it and the Panel can understand it, basically your organisation will put forward a technology that you would say is a proven technology and you would then use that technology rather than something that you have developed, your company has developed and sold?

DR HADEN-TAYLOR: Exactly.

SENATOR VIBERT: So you are actually using various technologies from other companies?

DR HADEN-TAYLOR: World class companies who are manufacturers of proven technology. We are packaging it with our own autoclave and steam boilers, which are, again, bought in from major manufacturers of steam boilers. All the equipment is manufactured by the top 20 British companies, all with proven track records, all with long-standing service agreements and proven track records.

SENATOR VIBERT: Right. Could you inform the Panel what data is actually publicly available on ----

DEPUTY RONDEL: Before you move forward, I think Professor Swithinbank has something.

SENATOR VIBERT: I am so sorry.

PROFESSOR SWITHINBANK: No, I am happy to come in after.

DEPUTY RONDEL: Right, okay, carry on.

SENATOR VIBERT: What data is actually publicly available on waste inputs, your process, autoclaving, and fuel preparation for gasification, plus mass balances and energy balances? Do

you have any publicly available data on those issues?

DR HADEN-TAYLOR: Yes, absolutely. I can provide you with a quantity of that. There is no question of that, no question. We have independently audited figures by the likes of Semcore and so on and Powergen, who have taken the fibre, looked at the calorific values, looked at the trace elements and whatever else is left within there. So, yes, we can provide you with a wealth of documentation in that context.

SENATOR VIBERT: Good, thank you. Could you also let us know who holds all the various patents of the systems that you are actually advocating?

DR HADEN-TAYLOR: Thermosave Engineering, which is our wholly owned subsidiary in the United Kingdom.

SENATOR VIBERT: Right. And so anything that you are putting to us as being part of your organisation you actually hold the patents through another wholly owned company?

DR HADEN-TAYLOR: Yes, exactly that.

SENATOR VIBERT: And one of the questions I wanted to put also to you on behalf of the Panel is whether you are familiar with the waste implementation programme of the UK, the new technology workstream and the Waste Technology Data Centre which is actually managed by the Environmental Agency?

DR HADEN-TAYLOR: Yes, we have worked very closely with them in the past and in fact the last meeting with the Environment Agency was a couple of weeks ago.

SENATOR VIBERT: And do you know if you are on the Waste Technology Data Centre, whether your company is on that?

DR HADEN-TAYLOR: I don't know, but what the Environment Agency did say is they are going to post our technology on their website specifically because of this … the United Kingdom have been claiming that they don't have a biomass industry and with this breakthrough that now, under the statutory Electricity Generating Instrument that describes our fibre as biomass and not animal by-products, it is therefore going to have a fairly sweeping effect on the fact that, with 45 million tonnes of municipal waste and 55 million tonnes of commercial waste, potentially 100 million tonnes in the United Kingdom could become biomass and ergo achieve some renewable

energy targets well on time.

This is the reason why, the only reason why, it has not been formerly done is a bog down with lawyers, and that is the reason why I am meeting Lord Whitty on 1st November with a team of lawyers, with a view to seeing if we can place a clear interpretation on it. On that basis then, we will be posted formerly on the Environment Agency and the DEFRA site and we are posted fairly regularly on the Department of Trade, UK Trade & Industry site.

SENATOR VIBERT: You see, the difficulty the Panel faces -- and I am sure this applies to the Public Services Department, although we haven't discussed it with them -- is that when we go to look on the Waste Technology Data Centre, which carries with it the equivalent of approval to some degree by the Environmental Agency, we can't find your company listed anywhere on there. Is there an explanation for that?

DR HADEN-TAYLOR: The Environment Agency licence was actually granted to Davis Brothers (Waste) Limited and not to us because they were the site owner and machinery operator.

SENATOR VIBERT: So would their name be on there?

DR HADEN-TAYLOR: Oh yes it is, because we … unfortunately it is applied not to the owner of the technology but to the operator.

SENATOR VIBERT: Right.

DR HADEN-TAYLOR: It is specific. It is an IPPC certificate relating to the site operation, the operation of the specific site.

SENATOR VIBERT: Right.

DR HADEN-TAYLOR: So it is site specific, it is technology specific and, therefore, it is operator specific in the same context.

SENATOR VIBERT: Right. Thank you for that. If I can just turn to some economics for a second, how does your process or equipment (I think it is best probably put) fit with renewables, with meeting Landfill Directive targets and waste stabilisation?

DR HADEN-TAYLOR: We have found that unsorted municipal waste is reduced in volume not by weight by 85% during the first few minutes of the process due to the breakdown of using

steam inside the pressurised vessel. We, by extracting the recyclables -- the aluminium, the glass, the plastics and ferrous materials and including the pollutants such as batteries -- are able to take all of these things out and therefore what is left is purely a fibre. That has been approved by DEFRA as a landfill cover. It has now more recently been described as a biomass and, therefore, has more meaningful implications in the medium term. We have about 4% of what is called clean inerts, inert material, which is basically pottery shards, fragments of brick and concrete and bits of earth and gravel. That we have, which is clean and sanitised and dust-free and can be disposed of quite happily to … it is almost used for land forming by the side of roads or wherever. There is no leachate, there is no gas, there is no greenhouse gases that will arise from those, so we are able to really produce a close to zero landfill solution, because the ash when the fibre is combusted, the ash represents only 5% of the weight. So if we have 100,000 tonnes, it is 5,000 tonnes of clean ash. That clean ash has no harmful trace elements in it and, therefore, can be used for the manufacture of readymix concrete, hydraulic concrete elements or concrete blocks. Therefore, you effectively have as good as makes no odds 100% or certainly 95% landfill diversion and recycling ----

SENATOR VIBERT: Is there actually anywhere where that ash can be analysed by our people?

DR HADEN-TAYLOR: It has been. It has been.

SENATOR VIBERT: No, by our people.

DR HADEN-TAYLOR: Oh by your people. Yes, we can certainly give you the ash I have also got independent analyses made by Semcore Industries, who are proposing to use our biomass in their renewable power plant just north of Newcastle. So they have done extensive tests on the combustion and the analysis of the ash.

SENATOR VIBERT: The reason I ask is we actually have a well known authority on ash as one of our experts and he has explained to us that in fact ash, he needs to look at the ash and do it himself.

DR HADEN-TAYLOR: Then we will give him a bag of ash.

SENATOR VIBERT: Thank you, indeed. Finally, the last question I would like to ask you is what recyclables can we actually obtain by the system?

DR HADEN-TAYLOR: Remarkably without sorting, any form of sorting, the recyclables, which are the various varieties of plastics, are recovered without any labels, without any food deposits, they are … if they are high density plastics or PVCs, they basically go back to their original molecular form, which is a ball. The temperature within the autoclave is such that it does not make the plastics sticky, so it doesn't come out like a suede shoe, which will render it unusable. The PET, which is basically the Coca-Cola bottle, Pepsi Cola bottle or whatever, those come out free of labels and even the pilfer proof collar, that is removed. That has a market value of circa £300 to £350 a tonne. The HDPE, high density plastics, they have a range of between £150 and £250 a tonne, but they do have applications on-Island. We could use them very easily, using the parasitic heat that is generated from the plant and also the electricity, which could quite comfortably generate employment and some exportable or locally used products.

SENATOR VIBERT: Right. Thank you very much.

DEPUTY RONDEL: Deputy Duhamel?

DEPUTY DUHAMEL: Thank you. Within the Strategy it actually indicates that the preferred course to be taken in respect of recycling and composting would inevitably take out some 35% of the materials. Bearing in mind that other European countries are running at substantially higher figures than that, could you perhaps comment on the potential for removing larger quantities of materials and to what extent your front end system would be able to do so?

DR HADEN-TAYLOR: If we take a very broad brush view that glass represents 5% of waste, plastics 15% and metals 5% and clean ash another 5%, you have achieved 30% recycling in one hit. There is the new Packaging Directive. The Packing Directive of the European Union previously prescribed that all packaging had to be recycled. They realised that was probably too wide a gambit and, therefore, they have actually narrowed it because they have said "Whoops, pizza boxes are actually soiled, so we can't recycle them and various other items." So items which previously were … there was an obligation by the manufacturer, by the retailer and by the user, the end user, the purchaser, that everybody had to recycle 25%, that has now been found to be unworkable because a great deal of the paper is actually contaminated by food and, therefore, there has been an amendment to the Packaging Directive which actually excludes food

packaging except the outer cartons. That has been the case. So pizza boxes, which represent quite a large amount of good cardboard, actually cannot now be recycled. That is just an example. So we are able to achieve as high as can be.

The United Kingdom recycles about maximum 12%, Scotland recycles around 4½% and Northern Ireland just under 4%. There are going to be some serious financial implications for failing to achieve the 25% target. Mr Blair in fact has increased that target to 30%, but that doesn't have any legal bearing on it. There is no financial penalty associated with that higher target. But we are able to achieve the highest level, given also the fact that local authorities will have extracted clean commercial paper, which also must be added to the recycling target; and paper can represent anywhere up to 20%, but if you said clean, it probably would be half of that. So we are achieving potentially as much as 40% recycling.

DEPUTY DUHAMEL: Okay, thank you. One other one. You actually referred to the price of dirty aluminium as being some £175 per tonne, but if put through your system and a clean aluminium was produced, the price achievable on the open market would be some £900. Are you in a position to actually substantiate that?

DR HADEN-TAYLOR: We have a contract with British Alcan, which says £960 per tonne for clean aluminium. When they were looking at the Echo-Decho system, which was to be put into East London, sponsored by Shanks, they were actually saying that they would be reluctant to purchase aluminium from that process because it is in fact both dirty -- in fact it is dirtier than it would actually be even via a can bank -- so we have arrangements with Corus and with British Alcan at prices which are of the magnitude that I have described.

DEPUTY DUHAMEL: One other. You also mentioned that some 3,450 tonnes of plastic were produced by the Island's waste stream and suggested that it may not be sensible to incinerate this plastic. Could you just elaborate a little further on that?

DR HADEN-TAYLOR: Yes. I think plastic is a resource, 3½ tonnes of drains parts, for example, if you were thinking of going with our technology and, say, £40 million, you could spend that in putting drains in for the rest of the 42,000 houses that exist on the Island that don't have public sewerage. You would need a huge quantity of plastic drain connection parts. It is a

relatively low technology, an injection moulding machine and terribly simple and we could therefore make not only parts for Jersey but also export them, make them a nice green colour and say "Whoopee, it's recycled" and we would be able to sell them both here for the local market and abroad.

Just as another example, 8,000 metres of electrical conduit are imported by Normans every year and sold specifically to Jersey Telecoms. That is a huge amount of waste air that is being transported from the United Kingdom to Jersey, at a huge cost to us, and therefore ultimately to we who pay the bills. So, yes, we could actually produce very good quality, continuously extruded conduit from the waste plastics. The technology exists and it wouldn't necessarily use 100% of the waste plastics. You might have to mix it on the basis of 50/50 with virgin material, but you would certainly be able to meet a great number of the local demands by using plastics and, therefore, would not need to burn it.

In addition, using a proven depolymerisation process, you can actually get a 90% efficiency for converting waste plastics back to diesel and that process is patented. It is available in Germany. The cost is probably … it is around about £5½ million, but such a process would produce … that would process 50,000 tonnes, so a relatively small module which actually handles about 5,000 tonnes, you are looking at something in the order of about a million pounds, and that could be brought on to the Island and it would produce close to 100% efficiency -- it is about 90-something per cent -- so 3½ thousand tonnes of plastics is, say, 3,200 tonnes of diesel oil. That is a process that is proven, it is available and it could be brought to this Island.

DEPUTY DUHAMEL: Thank you, and one final question then. Bearing in mind your comments about contamination, organic contamination, of paper, should the Island be moving in the direction of source separated organics or continue with a mixed bag system?

DR HADEN-TAYLOR: There have been a number of arguments. In the United States, in California, the cost of segregated or kerbside collection using two to three boxes or the blue box system, it ranges between $140 and $180 per tonne. In Canada, we are looking at $190 to $230 a tonne, but that is Canadian dollars. You are looking in … a test was run in Northern Ireland at Cookstown by the Department of the Environment and 50,000 tonnes and £142 a tonne was the

segregated collection cost. I don't believe Jersey should be spending close to £10 million a year on having a segregated collection system. I don't think it is affordable. I don't think it is justifiable. Our technology absolutely negates any requirement for Mr and Mrs Housewife to put anything anywhere.

The only thing that I would recommend, if you were going down the … which is what the British Government is looking at, is a two bin system. One bin is for everything and the other bin is for glass. Glass is a hazard. It is a bit of a bother in our process. It is not a difficult thing to extract, but glass could be separate, so the British Government is hung on a twin bin system and they are subsidising twin bins and giving everybody 50p on the bin, which is terrific, but what they are thinking about in places like the tenements of Glasgow where you have got two bins and having to hunt bits and pieces, I just don't know. It is not workable. It is extremely expensive.

People are … there was a British … there was a BBC programme last year which said that people were not prepared to segregate. They were paying their money for their rates and, as far as they were concerned, tough, someone else ought to be sorting it, it was their problem and it is not the waste generator's problem and all you would do is, if you were to impose source segregation, what would happen is they would take the bag of rubbish to the office and dump it in the bin outside their place and it would be non-source segregated. You wouldn't be able to know where it came from and that would be the end of it.

In Finland, which is probably the most sophisticated system, which also is adopted by Luxembourg and Germany, five bins, with an electronic chip in each bin, so if you have a party and there is too much glass, you get charged for it. Now, the consequences are that Finland produces quantities of compost and it is unsaleable. They pay to have the farmers take it away. Why? Human error. Little Jimmy in the middle of the night drops a Coca-Cola can in with the food waste. Immediately that is contaminated. There is no way of extracting it. So the result is we get costly. I was talking to HTV, which is actually the municipality that runs Helsinki, and they have more than a million people for which they collect waste. They find bicycle parts and they find all sorts of bits and pieces in the waste and they keep rendering composting or

segregation not really at all viable. It isn't viable. It is hugely expensive. It is a waste of a resource. On this Island it will just absolutely double or triple our waste bills and the public wouldn't accept it. We have enough difficulty as it is in getting waste out on to the road in a bin, you know, for people to collect, so I think we would have an awful lot of trouble if we tried to make twin bins or more.

DEPUTY DUHAMEL: Okay. Thank you.

DEPUTY RONDEL: Would your company be looking at all Jersey's waste, including scrap metal, waste oil and composting, or would it just be household waste?

DR HADEN-TAYLOR: Our process has successfully been able to break down the cellulose based materials such as potatoes, so 20,000-odd tonnes of agricultural waste per 10,000 tonnes of green waste, the branchage materials. That would very comfortably be processed in the autoclave. The municipal waste, unsorted can also go into the mill. So it would take those as being the areas of our expertise. I think the fragmentisation of motor cars under the End of Life Vehicle Directive is extremely good here in Jersey. It is probably one of the starring examples of actual efficiency, you know, where Jersey has got it right. If it ain't broke, don't fix it.

I think we could work with the fragmentisers to take any items that will come into the municipal waste stream and take those items down to the fragmentiser and say "Look, put it through your shredder." There is no point us spending £1 million on another shredder if you have got one down the road that will do the job and the amount of material that is going to be coming or arising within the municipal waste stream is relatively small, so we don't see that as being an issue.

Waste oils, there is a Waste Oil Directive from the European Union. We have … the gasification process could do it, but there are … but you would need to put a great deal of emissions control and cleaning equipment at the end of our stack if we were to do that. So there isn't really the justification to sort of load the cost by having a stack cleaning system that would deal with a few thousand, well a few hundred tonnes of oil, waste oil. I mean, our suggestion was that, I think, there ought to be a free container being given to all the households, that all types of waste oils, whether they are cooking oils or butters or whatever it may be, should be

poured into that and put out with the waste every week or every fortnight, whenever it is full, because it is having a very negative effect on our sewerage. In fact, oil is blindingly … our ultra violet sterilisation equipment at Bellozanne, so the consequences are that it is not operating effectively so we are having, despite the fact that we have been leaders in ultra violet use in sewerage discharge, it isn't working because we have got too much grease. People have been too lazy. They pour it into the drain. So I think the sooner we did that the better. I think it would be a lot, lot better for everybody if we had a segregated oil collection system. It is not going to cost a great deal of money. I mean, probably 50p or a £1 for the container, wide necked. Put it under the sink, everybody, and you could basically once a week, once a fortnight pick it up and have it properly dealt with.

There are some oil refining capabilities, not expensive. You can refine oil certainly to diesel oil standards, not obviously anything better than that. So it is possible. I would hate to imagine what that quantity would be if it was properly collected because at the moment it is being discharged to sewer and it has always been discharged in bottles or containers within the black bag that has been collected. So there is no real capability to audit what that might be in terms of quantity and, therefore, one could not do the business case for refining it, but there is certainly every vehicle, every garage ought to be encouraged to recycle all of its oil, or at least have a segregated collection, brought to a central place and then we will look at whether or not we can actually use it for a variety of applications.

DEPUTY RONDEL: Professor Swithinbank?

PROFESSOR SWITHINBANK: Yes. I am wanting to try and clarify the whole situation, because we are starting with a number of waste streams, or waste materials, and we are going eventually to their complete disposal. It seems to me, if I understand you correctly, that what you are suggesting is essentially the autoclave, which is part of the early process. That doesn't actually dispose of anything. It simply processes it to make it into a fibrous material, if I understand you. But you have given us lots of discussion. Wood, we are not clear whether that is treated wood or non-treated wood, a small factory to deal with that, another little factory to deal with … at one point you mentioned depolymerisation processes. Is this yet another little

process that you would do within the overall strategy? In the case of oil, this is yet another process. So we are coming up with a lot of pre-process material, then the autoclaving and then we go somewhat vague on the taking of that material right through to the ultimate disposal of ash and the quality of that ash.

DR HADEN-TAYLOR: Yes. I don't think there is any vagueness. I think there are a variety of technologies that we are aware of. We have a tyre destruction process that destroys tyres completely. It has got an IPPC certificate. It was developed ----

PROFESSOR SWITHINBANK: Yes, but what is it that you are actually proposing? Are you proposing to do all of these pre-processing … batteries, are you hand sorting batteries?

DR HADEN-TAYLOR: No, we are not hand sorting batteries. I mean, we use a trummel and an overband and drum magnet. I mean ----

PROFESSOR SWITHINBANK: But batteries are not magnetic in general.

DR HADEN-TAYLOR: And then the AD current separator, which will take out the non-ferrous materials. Therefore we know that in 100,000 tonnes there is only 28 tonnes of batteries. I mean, put it in the context, we don't have 100,000 tonnes of municipal waste here, so we have about 14 tonnes of batteries. Now, in my ----

PROFESSOR SWITHINBANK: So are the batteries then mixed up with the aluminium from the AD current -----

DR HADEN-TAYLOR: No. We can have a number of people who would be there just keeping an eye out for the batteries.

PROFESSOR SWITHINBANK: What, hand sorting?

DR HADEN-TAYLOR: Yes, hand sorting them, because the incidence rate is relatively low. Again, there is an argument for, you know, an advanced disposal surcharge. If you turn round and say to people "Look, if you have got batteries, you take your four batteries back to the shop and, if you have those four batteries, then you can be sold another four batteries." It is a piece of legislation which isn't difficult. It has been brought in in a number of countries. You can do that for tyres, you can do that for motor cars. We have advised the Cayman Island Government and they have introduced legislation for a motor car it is £250, for a motor cycle it is £175, for a

fridge it's 30 quid, for a computer I think it is £25 and for a tyre it is a fiver and for that you pre-pay. At a point where you want to buy it, the one time when you say "I have got to have that computer" or "I have got to have that washing machine" or "I've got to have that battery", you pay that premium then. It goes into a central fund. It, therefore, means that you the consumer, you who actually want that value, you can have that value, but you pay for it in advance, with a little hologram on the side of it to prove that when it comes up for recycling in two, three or fives years time, you are telephoned, PSD is telephoned, "I've got this fridge", they come along, there is the little hologram on it saying that 30 quid was paid for when it was purchased.

That is a very simple system. It operates in Canada, St Lucia, Barbados. It works in Trinidad on pre-paid containers and a whole range of bits and pieces and tyres. It works. That is something which we ought to be doing and if we do that, then we are going to eliminate from the waste stream such things as batteries, but, again, they are not a difficulty. They are the only one area that, with the exception of India, that is the only place in the world you can recycle torch batteries at the moment. So they are a problem. They will always be a problem. They will be 28 tonnes a year, possibly lower, 15 tonnes a year that will have to go to La Collette and have to go into what will be a sanitary landfill. That is a problem. No waste solution, incinerator or otherwise, would be able to deal with it any other way.

DEPUTY RONDEL: Senator Le Maistre?

SENATOR LE MAISTRE: You mentioned, Dr Taylor, about many of the plants that you are associated with or have signed contracts with around the world and you have mentioned a whole range of countries from Scandinavian countries down to South Africa, I think, and the Far East.

DR HADEN-TAYLOR: Hmm hmm.

SENATOR LE MAISTRE: If you were to pick one of those countries that you would want to say "Well, look, this is probably the best plant to visit which does the most of what Jersey requires", which one, because you have quoted several hundreds or maybe more, which one would you actually recommend would be up and running that is likely to be the best example for what Jersey requires?

DR HADEN-TAYLOR: Sadly, the contracts to which I have referred are contracts. We are now

… we have funded them. We have involved … in some of them they are conditional with a satisfactory environmental impact study being completed and obviously in some cases independent power producers' licences, independent power selling agreements or licences. So each of these we are at the stage now where we have got these … almost of all of them have acquired these various certificates and milestones before these contracts go live. We also have the funding in place.

Now, as a consequence, there are no plants, save for the Slough Heat & Power, which will show you a biomass, there are probably, as I said, 60 or 70 similar gasification, biomass gasification plants, operating in Finland, Denmark, Sweden and Canada that would be … any one of those you could go and look at and see a biomass destruction or combustion and you would see that as being clean, emission free and fully EU compliant in every case. So there are 50 or 60 of those.

Our process, I think one or two Members … I know Deputy Duhamel has certainly seen the autoclave process and he and others, I think, have expressed satisfaction that it certainly does what it says on the label. You know, we don't profess it to do anything more and so we have a process plant at the front and then we have a process plant at the back, which is anybody's, you know, any one of 20 different manufacturers that we can bring. But they are proven and working and we can take States Members to see them satisfactorily even as close as Slough, which has been successfully operating for 20 years, taking wood waste, which is the 3,000 tonnes of wood waste that we currently ship off the Island at £450,000 a year. We could put that straight through the very same Slough Heat & Power process biomass destruction plant, which is what we are proposing.

SENATOR VIBERT: But what you are saying to us is that we can actually go and see the technology.

DR HADEN-TAYLOR: Yes.

SENATOR VIBERT: But it is not a project of your company's?

DR HADEN-TAYLOR: No, but it is exactly the same technology from world leading class manufacturers that we propose to marry with our technology. I mean, you have got to get the best value for money. You have got to get the best for it to do the maximum amount of things

possible. Clearly what we are suggesting is that, by dealing with potatoes, dealing with branchage material, dealing with municipal waste without any form of sorting does achieve most of the objective. We then get the maximum recyclables and the maximum value for those recyclables because otherwise, if we don't get the maximum value, it isn't economic to move it off-Island, because we have that constraint. By adding the value, it does mean to say we can put approximately 24 tonnes of aluminium --sorry, 14 tonnes of aluminium -- into a 20 foot container and, at approximately £1,000 a shot, you are looking at £14,000. At best, it is 750, let us say £1,000, to ship the container off-Island, so we are looking at a net profit per container of £13,000. At the moment that is not achievable because it is dirty. It is being mixed with car batteries in order to make up weight. It is only being compacted and not shredded, so we are not getting the maximum quantity of aluminium into a container. So ----

SENATOR VIBERT: If I could draw this together so that it is right in my own mind, it would appear that what you are saying to us is that your company is the conduit for this technology, and if you were to do the job for Jersey you would actually be drawing in all the technology to deal with all of these issues that you have been discussing this morning, rather than that you actually own a system that you can come and put in yourself?

DR HADEN-TAYLOR: Yes. We would bring in Peter Brotherhood, you know, the manufacturers of steam turbines. We would bring in Wellman Engineering, manufacturers of steam boilers. We would bring in top quality British names, Babcock Vøland and the like, who would come in, bring in this technology and we would have an EPC contractor such as the likes of Simon-Carves and Semcore, with all the appropriate bank guarantees, performance bonds, 25 year service contracts, lifecycle issues would all be addressed and I think what ought to be remembered is that they will bring in the money. So there is no financial risk for the States of Jersey, none whatsoever.

SENATOR VIBERT: The issue in Jersey is that your actual techniques are described as the Haden-Taylor system. It is not actually a Haden-Taylor system.

DR HADEN-TAYLOR: No, it isn't.

SENATOR VIBERT: It is actually a conglomerate of a whole lot of technologies that you are

going to pull together ----

DR HADEN-TAYLOR: Exactly.

SENATOR VIBERT: ---- to provide this particular plant. Are we getting the picture?

DR HADEN-TAYLOR: Absolutely. But above all, we do have the nine years, nearly 10 years of operating in multi-plant, in taking unsorted waste and producing it into a homogenous material which can be best dealt with either via combustion or via gasification or via pyrolysis. But it does produce a homogenous material. Gasifiers, I think our experts here will confirm, do not operate with heterogeneous material. Heterogeneous material is mixed municipal waste. It has a variety of moisture contents. Our system is very simple. We take 20 tonnes of waste, which is $80m^3$ and you put it into an autoclave. You inject 20 tonnes of steam. Twenty tonnes of steam is 20 tonnes of water. Consequently, we are not moisture sensitive. Incinerators are moisture sensitive. The Sheffield incinerator had huge problems every Easter when everybody went out and mowed their lawns, shoved all the grass cuttings in the black bags, tossed it into the incinerator. It put it out for two weeks. That is the problem with incinerators. So we can't look at incinerators with branchage. I know you want to disagree with me, Jim, but ----

SENATOR VIBERT: I'm not holding him back.

DR HADEN-TAYLOR: No, absolutely, rein him in, rein him in. Anyway, I think, you know, we can deal with the branchage without going down an expensive compost. Crabbé has not worked. Crabbé has cost three-quarters of a million pounds. It is malodorous, it is inefficient and it produces something which nobody wants. So it doesn't achieve any of the sustainable issues, the sustainability issues. The windrow composting situation at La Collette is unsustainable. Any suggestion of buying some other composter, fine, let's buy some composters. We have got some fantastic composting and bagging machine up in Crabbé. What are we going to do with it? Nobody wants to operate it. Nobody can sell it when we produce it, so what are we going to do with it? Are we going to produce compost for the sake of producing compost? Mr Blair suggested we should produce compost. If we do that, we are going to have 20 million tonnes of the stuff in the United Kingdom, which would have a negative value. We will have a negative value here. There has never been anything other than a negative value for

compost unless you can guarantee that it is absolutely premium grade PAS100. That is the European standard of purity of compost, and we have never been able to achieve in Jersey PAS100, never, and we are not likely to.

DEPUTY RONDEL: Professor Coggins, please?

PROFESSOR COGGINS: Thank you, Chair. I would just like to make some comments on some of the points that you have made, and these are just observations and I have jotted down quite a few. Taking, for example, your last one, PAS100, it is not a European standard, it is a UK standard which has been developed by the Waste Resources and Action Programme. It has only been in existence for three years, so it has basically been … there is a lot of emphasis on collecting garden waste in the UK and it is one of materials that is collected.

Most local authorities in the UK are now going down what is generally called the three stream system. One is dry recyclables, the other is garden waste and the third is residual waste. Relatively few local authorities collect glass. Glass containers, normally the focus is on the bank system, and that is a historical issue with regard, as you mentioned, perhaps … partly with regard to health and safety issues.

You mentioned about biomass. Again, in terms of terminology, the term which is used in the UK is biodegradable and in terms you quote 100 million tonnes. For municipal waste the Government uses a figure of 68% of that and that is the figure that is eligible for any income that might be achieved from the renewables.

You mentioned food packaging. I would draw your attention to the amended Packaging Directive, which was published in February of this year, which has much higher packaging, recycling and recovery targets than the 1994 version.

You mentioned £900 plus for aluminium. I am intrigued as to how good that contract is because the prices from last Friday, for example, are £650 for loose of all cans and £700 for densified cans.

DR HADEN-TAYLOR: Yes, but they are dirty.

PROFESSOR COGGINS: But that is very similar for the prices for aluminium.

DR HADEN-TAYLOR: Yes, but British Alcan have put a recycling plant at 80,000 tonnes

capacity and they are prepared to build another one and, as a consequence, what they like about our material is that it is clean. The lacquers have been removed and the beverages, whether it is food or beverage contained within it, has also been sanitised and removed. The consequences are that you do have clean aluminium. It is free from lacquers and, therefore, it is when they are actually smelting that dirty aluminium that those lacquers contain heavy metals. The consequences are that they have to have extensive emission control on their smelters during the time that they process dirty aluminium. They do not need that when they are processing ours. Hence they are prepared to give us the difference between cleaning the stack emissions versus getting the clean material in. We have the contract -- I can exhibit it -- but we have the contract.

PROFESSOR COGGINS: Is any material being sent to Warrington at the moment, which was the plant you referred to, which was the only aluminium smelter in the UK?

DR HADEN-TAYLOR: Yes, that is where we have it.

PROFESSOR COGGINS: But is any material being sent to Warrington at the moment?

DR HADEN-TAYLOR: I suspect there is, but I wouldn't know on a day to day basis what the tonnage is, but I suspect that is correct, because we have a contract which says that.

PROFESSOR COGGINS: And then finally again it is a question of the dynamics of the situation. It is very interesting that this week, or last week, in Tokyo the United Nations has decided to declare automotive shredding residue from fragmentisers as hazardous waste, and that is having potentially a major implication now for the British metals industry in the UK with regard to operations that they run. But those are some general observations.

Can I go back a step and perhaps try and tease out partly what Senator Vibert was talking about? Can you take us through, firstly, the origins of the technology that you have referred to in Bridge End, in terms of obviously you mentioned Sheffield. Was this the Remtech technology that you were referring to ----

DR HADEN-TAYLOR: Yes.

PROFESSOR COGGINS: ---- which was put into Sheffield.

DR HADEN-TAYLOR: That is right.

PROFESSOR COGGINS: Again, obviously, I speak with a certain amount of background on

that.

DR HADEN-TAYLOR: Yes.

PROFESSOR COGGINS: Can you take us through the changes in where Remtech in Sheffield and your company as it stands at the moment and its involvement in Bridge End?

DR HADEN-TAYLOR: It is very simple. When Remtech put the system in to Sheffield, it didn't work, so they went to Beales, BIP Beales, of Lincoln, who are boiler makers and autoclave manufacturers and said "Can you help? You must know about steam" and they said "Well, no, we can't, but we do know a man who does" and that man was Tom Wilson, managing director of Thermosave, our wholly owned subsidiary. He has been involved in steam for 30 odd years, manufactures and has delivered hundreds of steam accumulators to hospitals and steam systems to the likes of Northern Foods, Express Dairies, Pitsburgh Glass, Pollypeck, Courtaulds Hosiery, you know, you name it, a whole list of probably the top 100 at least companies in the UK. He looked at it and said it will not work without steam accumulation and it needs a complete redesign.

As a consequence, we were commissioned to design it, but on the basis that we would subsidise the design and thereby retain the ownership of any drawings and any of the technology, particularly given the amount of experience that 30 years of working knowledge in the steam industry that could be applied to the design or the redesign to make a viable system, that was done and a patent was actually applied for as a consequence of doing that work. We … our work was about a shade under a million pounds. We actually only invoiced £440,000 to Beales. They in turn built the two vessels that went to Bridge End and we then commissioned it. They also built the boilers, or the boiler, and they also built the steam accumulator and the condensate vessels. The other separation equipment was acquired on the cheap from Denmark. Sadly it didn't come with a service package and it has slowly deteriorated in its efficacy.

The actual equipment was designed and built … well, it was built by Beales, designed by us, patented by us and it is a process patent, incidentally. An autoclave was first patented about 200 years ago and, therefore, it wasn't really appropriate that we could do that, but we are able to have a process patent and that is because we take waste coming from the building, unsort it, it

goes into the autoclave, goes through a trummel, which is basically a rotary sieve and there it is under a drum magnet to extract the ferrous, AD current to separate it to take the non-ferrous materials. A fibre is left. There is a picking station and the fibre is then put into a cyclone. Any hearing aid batteries or anything like that and little bits of glass drop to the bottom. It is blown through an air knife, which again is a tunnel, but everything that flies obviously can fly and anything that isn't will slither down and be collected and so we have fibre and that fibre was to be gasified using the GEM process.

We have no involvement in the GEM process. They have found that their gasifier, the pilot one which they operate from Romsey, does operate very well using our homogenous, dry fibre, providing the moisture content is below 3% or 5%, and we are getting a very high conversion rate. I am not associated with GEM. In fact, when the States Members went over about 18 months ago to Bridge End, they were promised beforehand that the plant would be operating by GEM direct and, when we got there, it wasn't. That is due to financial disputes between the Davis Brothers and GEM and nothing to do with the equipment or, more particularly, nothing to do with us. We have only been selling what we can sell. What we have done is packaged now with known technologies, with leading, world class manufacturers of equipment that we can therefore produce a package and, in order to provide the maximum comfort, people of the order of Semcore, 11,000 people and about a nine billion turnover, are able to deliver our equipment. I might add that our equipment has been thoroughly and exhaustively examined by the World Bank, by a variety of different banks and due diligence has been done on it by at least eight different consultancy firms that I am aware of. It depends who is paying though whether you get the … which result you get, because I have seen two from Babtie Fichtner, one for the States and one for a bank and both of those seem to be different, but there we go. I speculate, or I dare not, I suspect, given the warning I just got here.

PROFESSOR COGGINS: So the various changes that I was leading to are linked with RTL Remediation and Jack Allan, all those have never been clarified?

DR HADEN-TAYLOR: No, well, there is competition in the market. You have to accept that there is always going to be competition. You can't have the whole pie.

PROFESSOR COGGINS: I am just referring now to obviously RTL Remediation is the company behind Remtech.

DR HADEN-TAYLOR: Well, that is in liquidation.

PROFESSOR COGGINS: And Jack Allen took over that.

DR HADEN-TAYLOR: And Waste Cleansing and Recycling, which is his other company. That is in liquidation. So periodically … I mean, everything that they have been associated with goes into liquidation, so … and Slane Environmental is in liquidation, so, if you go down the list, it is … you know, I don't know what we can do about it, but they still are out there marketing it, but they haven't been successful and they haven't been successful because they have never built a plant. They have no manufacturing skills. They have switched manufacturers four times.

PROFESSOR COGGINS: And this is? Which company is this?

DR HADENT-TAYLOR: This is Jack Allen, you know, Jack Allen's whichever one you want to put it, Estech, Remtech has gone, RTL, which is the same thing, Remediation Technology Limited, that company has been liquidated. Slane Environmental is limping, BIP Beales has been merged with Cochranes. There was a Beales Remtech. That has been in liquidation. Waste Cleansing & Recycling, which had a licence which it bought for £25,000 from Remtech to sell the technology, relying on an American patent which doesn't exist, that was for £25,000. Alba Resources, formerly Scottish Coal, bought a licence for £250,000, so they were completely conned in buying a licence for Scotland and they haven't sold a plant either. We are the preferred technology in five of the Scottish local government tenders and we have nine current planning applications in at the moment for plants to go in the United Kingdom, that is one in Belfast, five in Scotland and three in the United Kingdom. One is to be announced at any moment in London, where we already have the contract, but we can't actually say what it is for the minute.

PROFESSOR COGGINS: Was it, I understand, GEM who will no longer be operating the gasifier at Bridge End?

DR HADEN-TAYLOR: I don't … well, it's still sitting there because it belongs to Davis Brothers. Davis Brothers paid a million pounds for it, but it was part of a contract whereby,

subject to the first one being built, three more subsequently being sold or bought by Davis Brothers for another £7 million, Davis Brothers are in default on that. GEM are in default because the equipment doesn't work. So there is a general spat between the two of them, which I distance myself from. There is no profit in involving oneself in something which is moribund.

PROFESSOR COGGINS: But, as I understand it, a new autoclave plant is under order for Bridge End. Will that be from your company?

DR HADEN-TAYLOR: We are in negotiation with Davis Brothers for the supply of an upgraded system because Biffa have obtained, using the autoclave technology, an increased waste contract for circa 350,000 tonnes and Bridge End are particularly anxious to see it being processed through the Davis Brothers plant. Hence the old plant has been taken out and we are negotiating now for the supply of ----

PROFESSOR COGGINS: But you haven't actually got the contract, you are negotiating?

DR HADEN-TAYLOR: We control it. There is a company called … There is a company called … (**Pause**) … No, I have forgotten its name. It used to be called Black Bag Waste, which operates the licence now of our technology at Bridge End, and that is the company that is buying and not Davis Brothers. Three of my directors are on the board of that company, so we are landlord and tenant in terms of what we want to buy or not to buy and whether we choose, if that is the appropriate venue, there are alternative venues which would actually bring more credit to the technology than the rather quixotic way in which it is being run at Davis Brothers.

PROFESSOR COGGINS: Then finally, Chair, you mentioned IPPC. As I understand it, the Environment Agency is negotiating with Davis Brothers to have IPPC applications submitted by the end of next March under the window that is available to the UK Government with the Waste Incineration Directive.

DR HADEN-TAYLOR: That is right.

PROFESSOR COGGINS: So that, in terms of the plant at the moment, it doesn't have IPPC ----

DR HADEN-TAYLOR: It has an EA site licence for processing unsorted waste for gasification and for electricity generation.

PROFESSOR COGGINS: But that is not IPPC in terms of the European Directive or the UK

Directive.

DR HADEN-TAYLOR: No, but I have mentioned the IPPC in the context of our tyre destruction plant, where we do have it, which is not yet down there. In fact, it probably will not go there.

DEPUTY RONDEL: Thank you, Professor. Deputy Hill?

DEPUTY HILL: Yes, thank you. A number of points I was going to make have now been covered, but a few things if I could go over.

DR HADEN-TAYLOR: It is always the trouble with being last, isn't it?

DEPUTY HILL: Pardon?

DR HADEN-TAYLOR: It is always the trouble when you are last.

DEPUTY HILL: Yes. Is it reasonable to say, and I don't want to use a pun and make it "tailor made", but the aspect for what Jersey wants, you know what Jersey is and Senator Le Maistre asked a question really about which one would you say would be the best one for us to look at as an example. Would you say it is necessary really for Jersey to have an all singing, all dancing something especially for Jersey which you wouldn't expect to go to maybe Sheffield or elsewhere because if you are Sheffield or anywhere else you can possibly get rid of some waste over there to Manchester or somewhere?

DR HADEN-TAYLOR: Well, you are absolutely right. You are absolutely right, Deputy. I think, you know, it's horses for courses.

DEPUTY HILL: Yes.

DR HADEN-TAYLOR: I mean you would have to have a big shredder in certain plants because you want to get rid of tyres or you want to get rid of desks or mattresses or sofas that will turn up or carpets, but here we have already got quite a number of shredders and other bits and pieces. They will need to be probably upgraded or looked at, but it has always been very difficult because I think PSD have said "Well, look, let's see a plant that does it all."

DEPUTY HILL: Yes.

DR HADEN-TAYLOR: Well, you can't, because this is an island where we need a lot more things than you would normally expect to have in another waste plant in the United Kingdom, where you could actually, say, divert a mattress away and say "I'm very sorry, but I can't process

this mattress, take it somewhere else." The local authority will have to deal with that in a separate way at a public amenity centre, or a television, you know, or a washing machine. But, unfortunately, here everything has to be dealt with. As I said, the fragmentisation programme works extremely well. We have got a very, very high level, 9½ thousand tonnes of steel going off the Island, which is great. The plastics have a … there are thousands of tonnes, which is outside the 3,450 tonnes that I have referred to. There is a huge amount of plastics coming out with motor cars, you know, the innards of motor cars. They should be used. There is a lot of ferrous with a lot of non-ferrous material, engine blocks, gear boxes and so on, where they could have some higher values. So, yes, we have looked at our system and we can say "We know what the green waste is. We know what the agricultural waste is. We know what the plastics are and we know what the glass situation is and we know that we have an ash at the end of it which is, provided we have vigilance in the sorting process, which is 95% mechanical, 5% hawkeye, you know, physical hand-picking, we are in a situation whereby we ought to be able to produce a system that works very well for Jersey, extremely well for Jersey." It is, if you like, tailor made for Jersey because it would necessarily be required elsewhere.

DEPUTY HILL: Are there any examples on small islands that one could look to? You mentioned Barbados.

DR HADEN-TAYLOR: Well, Barbados have brought in consultants. They have come over to England and they have seen everything. It is the same with the Cayman Islands. They have done exhaustive research. They have now put us as the preferred technology and, therefore, we are likely to get the contract some time in the New Year. The World Bank has asked us to come in, however, now, with a sort of emergency aid situation because of the waste that is causing disease, illness and problems ---

DEPUTY HILL: It is a hot country.

DR HADEN-TAYLOR: And, because Ivan has devastated most of their landfills, what they now want to look at is whether we can actually bring on an emergency programme, and we have World Bank support for doing that. So that … I had a meeting last Friday and there is a working committee meeting this coming Friday to see what proposals we can actually come up with very

quickly.

DEPUTY HILL: So what you are saying really at the end of the day is it is possible to get something which may well come under one umbrella for Jersey, but there is not really anywhere else that one can look to see as an example.

DR HADEN-TAYLOR: You can go for the … we can show you the recyclables. We can take the unsorted waste. We can take it and extract those recyclables. We can extract the pollutants, such as batteries. We can extract the glass. We can produce this fibre. We can then take that fibre ----

DEPUTY HILL: Could I ask, is that before it goes in or at the other end?

DR HADEN-TAYLOR: That is before. As it goes into the autoclave, it arrives unsorted, goes into the autoclave and what happens afterwards is a serious of extraction or sorting processes. When we have the fibre, that fibre has the same characteristics as Douglas Fir. It has 11 mega joules per kilogram. It has 35% moisture. That is exactly the same as a Douglas Fir. We take that material and we take it directly to Slough Heat & Power. Slough Heat & Power, which Babtie Fichtner accepts is a model example of technology, which does work and they are going to prescribe that solution for Jersey and they would say that it is acceptable to Jersey. It is proven, it is tried, it is tested and it is a biomass combustor. We produce a fibre -- whether you want to call it biomass or biofuel or bio-something -- it is a fibre that has the identical characteristics of that of Douglas Fir. Since Douglas Fir or pine or soft woods is the fuel that is being used at Slough Heat & Power, we can therefore say -- and it is agreed by Messrs Bennie, Richardson and whatever his name is from Babtie Fichtner, they have all said -- “Well, if that is the case, yes, we agree with you. So the answer is that that is from a recent meeting.

DEPUTY RONDEL: I am conscious of the time. We have got two minutes left before the eleven o’clock deadline and I am aware that Deputy Hill still has another question. Senator Vibert also has question. I will allow those to be put. You can put one, Deputy Hill, and Senator Vibert the other.

DEPUTY HILL: Okay. Just to finish off then, things like clinical waste and carcasses, do you think that is all possible under one umbrella again or would we have to ----

DR HADEN-TAYLOR: We had an Irish delegation with 20 tonnes of waste, 10 tonnes from Dublin and 10 tonnes from Northern Ireland. They went and cleaned out the Sainsbury's supermarkets of all the turkeys and chickens, tossed them all in there and 90 minutes later we couldn't find them. So the answer must be Yes.

DEPUTY HILL: How about cattle and horses and that sort of thing?

DR HADEN-TAYLOR: No. We wouldn't … well, theoretically yes, but there are some aesthetic issues, but certainly in Saudi Arabia they take animals and they take medical waste. They shred them and they put them straight through an autoclave and it works. In France they shred medical waste. Hospital waste, 85% of hospital waste is basically nothing more than dressings and cellulose material, so the answer is yes, but in terms of drugs, the answer is no, the reason being pryons. Pryons are the things that are released from antibiotics, potentially in the released steam. As a consequence there are some issues about cross-contamination.

DEPUTY RONDEL: Thank you. Senator Vibert?

SENATOR VIBERT: I have just got one question and, if I may, make one comment. The question really is this. In the public domain there has been a figure mentioned that you or your organisation could actually do the job for Jersey for about £40 million, compared to £80 million for an incinerator. Now, I don't want to ask you whether that is correct or not, but, assuming that it is, what would we be actually getting for the £40 million? Would you actually design the project, fund the project, build the project, operate the project and would you actually own the project?

DR HADEN-TAYLOR: Yes to all of those.

SENATOR VIBERT: Yes to all of those. Thank you. And my final comment is I just want to say how disappointed I am by one of the answers you gave to the question, which was where we shall we go and look at a plant, because I thought Barbados would have been a natural thing to have said.

DR HADEN-TAYLOR: As soon as it is up and running, I will have your bag packed, Senator, and I will throw in some factor 24.

DEPUTY RONDEL: On behalf of the Panel, I would like to thank you for your submission, Dr

Haden-Taylor, and thank you. We will now have a recess for 12 minutes until 11.15, when we interview our next witness. Thank you.

DR HADEN-TAYLOR: Thank you. Do feel free, any of you, if you actually do have any other questions, do feel free to contact my office and I will be delighted to respond in any way outside of this, you know, if there is any other question you forget.

DEPUTY RONDEL: Thank you very much.

DR HADEN-TAYLOR: Please ask and I will answer it. Thank you.

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