REPORT ON PROCEEDINGS BEFORE

PORTFOLIO COMMITTEE NO. 6 – PLANNING AND ENVIRONMENT

INQUIRY INTO ENERGY FROM WASTE TECHNOLOGY

At Macquarie Room, Parliament House, Sydney on Monday, 7 August 2017

The Committee met at 10:00

PRESENT

The Hon. P. Green (Chair)

The Hon. L. Amato
Mr J. Buckingham
The Hon. J. Graham
The Hon. S. Mallard
The Hon. M. Mason-Cox

The CHAIR: Good morning and welcome to the inquiry into energy from waste technology. This is the third hearing of the Portfolio Committee No. 6 inquiry into energy from waste technology. This inquiry is examining the waste disposal industry in New South Wales, including relevant legislative and policy provisions, the impact of waste levies and the capacity of the industry to meet future demand. The terms of reference also consider the need to identify and to manage the risk of monopolisation in waste disposal markets, the role of energy from waste technology in addressing the State's waste disposal needs and opportunities to encourage a circular economy within the industry.

I acknowledge the Gadigal people, who are the traditional custodians of this land. I also pay my respects to elders past and present of the Eora nation and extend that respect to Aboriginal people who may be present today. The hearing today is the third of four hearings we plan to hold for this inquiry. Today we will hear from NSW Health, MRA Consulting Group, the City of Sydney, Sutherland Shire Council, Wollongong City Council, Southern Sydney Regional Organisation of Councils, Shoalhaven City Council, Associate Professor Bernadette McCabe, Dr Ali El Hanandeh, Outotec and Active Tree Services.

Before we commence, I will make some brief statements about the procedures for today's hearing. Today's hearing is open to the public and is being broadcast live via the Parliament's website. A transcript of today's hearing will be placed on the Committee's website when it becomes available. In accordance with the broadcasting guidelines, while members of the media may film or record committee members and witnesses, people in the public gallery should not be the primary focus of any filming or photography.

I remind media representatives that they must take responsibility for what they publish about the Committee's proceedings. It is important to remember that parliamentary privilege does not apply to what witnesses may say outside of their evidence at the hearing. I urge witnesses to be careful about any comments they may make to the media or to others after they complete their evidence as such comments would not be protected by parliamentary privilege if another person decided to claim an act of defamation. The guidelines for broadcast of the proceedings are available from the secretariat.

There may be some questions that a witness could only answer if they had more time or certain documents to hand. In these circumstances witnesses are advised that they can take the question on notice and provide an answer within 21 days. I remind everyone here today that committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. I therefore request that witnesses focus on the issues raised by the inquiry's terms of references and avoid naming any individuals unnecessarily.

In terms of delivery of messages and documents tendered to the Committee, witnesses are advised that any messages should be delivered through the committee secretariat. To aid people with difficulty in hearing, there is an opportunity to sit closer to the front seats. We ask witnesses to speak into their microphones and to keep their microphones close to them so they can be heard. I ask anyone present to turn their mobile phones to silent or switch them off for the duration of the hearing.

BEN SCALLEY, Director, Environmental Health Branch, NSW Health, affirmed and examined

The CHAIR: I welcome our first witness, from NSW Health. Do you have an opening statement you would like to present?

Dr SCALLEY: I do.

The CHAIR: Thank you.

Dr SCALLEY: Firstly, I would like to thank the Committee for inviting NSW Health to appear at this inquiry and assist in the deliberations into the potential health risks or health impact from energy from waste facilities. I will have a focus on air quality impacts in these brief opening remarks. To do this I would like to talk very quickly about the current air quality situation in Sydney and what, if any, additional risk energy from waste may produce and how also to consider, as we would routinely do, any potential benefits from these projects against these potential risks.

It is important first to mention briefly that our current air quality in Sydney and New South Wales is good, but even at this level it can still cause adverse health impacts. Relative to most industrialised countries, the greater metropolitan region around Sydney has comparatively good air quality. Even in the rest of the State it is generally good. But there is a lot of work done internationally in areas that have even better air quality that strongly shows there would be potential benefits to improving our air quality even further. This is especially strong in the area of particulate matter emissions. That is why we consider particulate matter very closely when considering air quality impacts of any proposal, because if these are minimised and reduced further we know that there would be health benefits from doing this.

Everyone is susceptible to air quality impacts. However, there are particularly vulnerable people that it is important to consider. The evidence is strongest for vulnerable people being those with chronic cardiovascular disease as well as respiratory disease. Because people tend to have higher rates of disease in areas of socio-economic disadvantage, it is important that we consider where these air quality impacts occur; they can have greater impact in different areas.

Energy from waste facilities can have a variety of impacts in terms of air quality, both particulate matter more generally but also a number of specific chemicals being both gases and particles. Many of these substances are associated with health risks, but the risks to the population from emissions from energy from waste facilities obviously very much depends on the specific chemicals in the emissions and also how much of these substances are emitted. It is my understanding that the characteristics of the emissions from these facilities is determined by the amount and type of feedstock, the combustion processes specifically used, and the efficiency of air pollution control technologies employed to reduce these emissions.

Unlike many other industrial sources of air pollution that might use a single source of fuel—that is, a coal-fired power station or many industrial processes—energy from waste facilities can derive their feedstock from a wide variety of sources. This poses a difficulty in predicting the health risks, because if the feedstock and the air pollution differ it is very hard to predict what the health risks may be from these facilities. Put simply, it is important that we know what is being burnt in the energy from waste process in order to properly assess the potential health risks from the air pollution coming out of the facility. Some other important considerations when assessing population health risks are the extent to which the population is exposed to emissions and the susceptibility of the population surrounding the area, which I mentioned previously. Exposure and susceptibility will depend on the location of that facility and the demographic and health characteristics of the population around that area, especially socio-economic disadvantage.

Lastly, I just wanted to briefly talk about any potential health benefits of these proposed facilities. It is important to consider these potential benefits. I note it has been mentioned in a variety of different sources that these facilities might reduce greenhouse gas emissions. I am unable to comment on the validity of these claims, but these potential benefits would need to be weighed up against these potential health risks as well. It should also be noted that many human activities do have air quality impacts. Transport, mining, industry and agriculture all have some impact, including energy generation by coal-fired power stations. We need to consider what the impacts might be from these comparative to other potential sources of energy, but noting that some of those sources can have essentially no air quality impacts.

There are also impacts more broadly on the rate of recycling that I know the Environment Protection Authority [EPA] has discussed previously, but I do not have expertise in this area. As health risks associated with any energy from waste facility will be specific to the facility, any assessment of the overall benefit of a facility needs to be done on a case-by-case basis, especially when the feedstock can differ so broadly. Broad

statements are really difficult in this area. In conclusion, energy from waste facilities that can expose a large population to potentially hazardous substances need to be really carefully considered. The uncertainties regarding the waste to be burnt as well as uncertainty regarding the performance of the plant make it very difficult to determine what the health risks might be from a proposal. It is important that those things get worked through. I would be happy to take any further questions at this point.

The Hon. JOHN GRAHAM: Thank you for your evidence already this morning, which has been very helpful. I will start at the general policy level. Given the views you have set out, you are not opposed to this technology altogether? There may be circumstances where this technology meets the tests that you have just outlined and there may be instances where it does not. Is that correct?

Dr SCALLEY: Yes. The EPA, I understand, is the Government lead in this matter and it has a policy that is relevant to this area that you have probably heard about previously. As a general rule, we would not have concern about the basis. It is always based on what the health impact and benefit would be of any proposal, and that is not specific to energy from waste; that is across the board.

The Hon. JOHN GRAHAM: Yes, but I want to ask about the specific waste incineration proposal at Eastern Creek that has been the subject of much discussion in the Committee. You have talked about the area that surrounds that particular project. You have talked about socio-economic disadvantage and looking at the demographic and health characteristics of the sorts of communities that these projects might be located in. This area of Western Sydney is one of those areas where those health characteristics and those socio-economic disadvantage questions will be higher than in some other bits of Sydney. That is correct, is it not?

Dr SCALLEY: West and south-west Sydney is an area that has higher rates of socio-economic disadvantage and for some of those diseases I have mentioned.

The Hon. JOHN GRAHAM: The thing you did not refer to was the physical nature of the Sydney Basin. The Committee has received some evidence about air quality in the course of its deliberations. Is there anything you would like to add about that particular question as it relates to air quality?

Dr SCALLEY: That is a really important point. The EPA normally has the most expertise in that area. Sydney is a basin and is a single air shed, especially in the areas south-west of Sydney. There are some greater air quality impacts than in other areas that are more related, as I understand it, to geography and how the air moves around that area. For example, ozone impacts tend to be higher in that area so it is an area that is somewhat impacted by these issues already because of that issue alone.

The Hon. JOHN GRAHAM: What you are describing is a double impact: firstly, where the health characteristics might be worse in some of the surrounding areas but, secondly, where the physical characteristics might exacerbate the air-quality aspects.

Dr SCALLEY: Issues related to air quality in the formation of the ozone do tend to be worse in that area, as you mentioned, and also people are more disadvantaged, so they are already being impacted by air quality.

The Hon. JOHN GRAHAM: Thank you for that. You have set out three criteria that these emissions will depend on: firstly, the amount and type of feedstock; secondly, how the plant performs; and, thirdly, what the emissions control aspects are. I want to turn to the first of those, the amount and type of feedstock. One of the concerns that has been put in front of the Committee is that we do not know what that feedstock will be, particularly given the large size of it. Are you able to shed any light on what that might be?

Dr SCALLEY: On what the waste would be?

The Hon. JOHN GRAHAM: Yes.

Dr SCALLEY: No. I do not know. We are primarily concerned with what the outputs would be in terms of health. The EPA, on my understanding, would regulate the waste in general and the proponent would be talking to them about what would be the characteristics of that waste. But within NSW Health, we do not interact on what would be the feedstock.

The Hon. JOHN GRAHAM: The EPA has told the Committee that they also do not know what this feedstock will be. Is that of concern to you in making the assessments you have to make from a health point of view?

Dr SCALLEY: Yes. As I mentioned in my opening remarks, the concern we have is that the control over what is the waste going into the facility is a key determinant, and the uncertainty surrounding that leads to an uncertainty in us saying what the health risks of the facility are.

The Hon. JOHN GRAHAM: The EPA gave evidence to say that they do not support this proposal; they cannot support this proposal without some better answers on that feedstock question. Would you agree with that assessment?

Dr SCALLEY: As in our response to the environmental impact statement [EIS], we agreed with that. One of the key issues there was uncertainty about how we assess the health risks of the proposal. One of the key parts of that uncertainty is not knowing what will actually be in the feedstock going into that facility.

The Hon. JOHN GRAHAM: The EPA also agreed in relation to the EIS to which you have just referred that it was supposed to provide improvements in relation to information about odour assessment, soil and water assessments, and site contamination investigations, and that these were all incomplete. Is the EIS complete from your point of view? Does it provide enough information in its current form for government to be able to give this the tick?

Dr SCALLEY: Just to clarify, we would not be approving or not.

The Hon. JOHN GRAHAM: I understand that, yes.

Dr SCALLEY: But, in its current state, is it sufficient for me to be able to characterise the health the risk of it? No, it is not.

The Hon. JOHN GRAHAM: The most fundamental question for you is that feedstock question.

Dr SCALLEY: Yes, that would be the major question, although there are others.

The Hon. JOHN GRAHAM: Can you tell us about the others?

Dr SCALLEY: I suppose, as I mentioned, the feedstock coming in is a key one because it is one of the major uncertainties. I also mentioned—and here we rely on expertise in other agencies, mostly the EPA—the effectiveness of the ways to treat the air emissions that might be coming out and to minimise them. If you have uncertainty about what is coming in and you have uncertainty regarding how good the technology may be in reducing those emissions—and we would rely on the EPA for that part—then the uncertainty of what is coming out as in the air-quality emissions leads to the uncertain health risks. Our expertise really comes from when we know what the emissions are coming out, characterising the health risks, so we are sort of last in the chain.

The Hon. JOHN GRAHAM: One thing that impacts on this, and on the judgements you have to make, is the scale of this proposal; not just the double uncertainty you were referring to. Does the scale of the proposal and the fact that is has to source the feedstock from far and wide to meet the large numbers make your job harder?

Dr SCALLEY: The scale is not necessarily as much of a concern for us. I understand that maybe other agencies have concerns about that, but what I really need to know is what the air quality impacts are at the end. I would not have the expertise to comment on the scale and what the technology can perform at that scale.

The Hon. JOHN GRAHAM: But it does go to the uncertainty around sourcing that amount of feedstock, including from competing facilities that are either existing or planned across the Sydney Basin or possibly beyond. Questions have been put to the Committee about exactly where that feedstock will come from and how it might change over time. Does that go to the feedstock question you are raising?

Dr SCALLEY: It may have impacts, but I do not have the expertise to know what that influence would be.

The Hon. JOHN GRAHAM: The evidence put to the Committee is that it will be difficult to say. The other concern the EPA put to the Committee was that it has not been shown a reference facility elsewhere in the world, which is something that is fundamental to its policy. Do you have any view on that?

Dr SCALLEY: We definitely lean on the EPA's expertise there, but my understanding is that the overseas reference facility that was used was much smaller in scale.

The Hon. JOHN GRAHAM: At the moment you lean on the EPA for some of those fundamental questions, and the EPA has told the inquiry that it does not support this proposal in its current form with the current information. That is reasonably decisive when it comes to your consideration of these human health impacts, and that has to weigh very heavily and we should take that very seriously.

Dr SCALLEY: For a lot of the consideration we give to this issue, we would rely very heavily on the EPA's assessment of those fundamental issues.

The Hon. JOHN GRAHAM: You talked about what goes in being very important, but one of the things that did concern me was the evidence provided by the company when was asked; it was much less concerned about that view. It was told that significant concern has been raised about the lack of ability to identify what is proposed to go into this facility, and was asked if it was arguing that it did not matter. Mr Roddis, representing the company, said: "Largely, if we take the guidance of the proponents of the facility, no, the content of the waste is not important." Do you have a view about that statement?

Dr SCALLEY: I think the content of the waste is important because the content potentially results in what the emissions are, depending on the treatment technology. My understanding from the EPA and others is that there can be issues when treating certain types of waste in ensuring that there are no substances in the emissions that cause harm to health.

The Hon. JOHN GRAHAM: Is that not fundamental? It is one of the three key criteria that you have set out, but we have the company saying it does not matter what goes in.

Dr SCALLEY: Once again, I think the feed stock is really important.

The Hon. JOHN GRAHAM: Thank you for that. Lastly, I want to ask about the other evidence the Committee received, which relates to some of the monitoring. The argument was made that because of the way Australian standards are applied and because we do not have the continuous sampling processes which are used elsewhere, there might be spikes in the emissions that relate to particular events in the incineration process. I am interested in your view about whether or not that is something that should be of concern to the Committee.

Dr SCALLEY: Do you mean the monitoring from the stack?

The Hon. JOHN GRAHAM: Yes, I believe that is right.

Dr SCALLEY: Sorry, was your question that there was concern that there might be spikes?

The Hon. JOHN GRAHAM: Essentially, the evidence put to the Committee, particularly from the National Toxics Network, argued that because we do not have continuous-sampling technology—that is, the AMESA technology—which can continuously sample for hundreds of hours and capture the full range of operational variability, there will be spikes that are not necessarily picked up in the less continuous sampling that might be used in Australian conditions, even though the emission standards are quite strict. I wonder if you could shed any light on that?

Dr SCALLEY: We are multiple steps away from that situation in that we are currently looking at the potential impact. But monitoring would obviously be relevant to that once the facility was up and running. It depends on the substance that they are monitoring for because some substances have long-term guideline values. Short and moderate increases in the concentration are not relevant in determining the health risks for them, whereas for other substances those short impacts can be relevant. It depends on the substance, but for many of these substances, it is the long-term years and years of exposure that are of relevance.

Mr JEREMY BUCKINGHAM: For the benefit of the Committee and the report, can you outline how NSW Health is involved in these processes? You said the EPA takes the lead in these matters, but how are you involved in these types of developments, and who takes responsibility for providing input from NSW Health?

Dr SCALLEY: As with a lot of different planning processes, the Department of Planning and Environment is a key agency in assessing the appropriateness of the proposal. The EPA is an important regulator in understanding this space for a few different things, including air quality and waste. When an environmental impact statement is put on public display the public can comment on it, but it is also an opportunity for government agencies to comment. When we or others consider there to be a potential health risk, we will often do a response to the environmental impact statement. We have put in two responses for the proposal around the Eastern Creek prospect area, as we would routinely do on developments. We do not have a strong regulatory role in this space, but because of potential or perceived health risks we often put in responses to these proposals, and that is what we have done here.

Mr JEREMY BUCKINGHAM: When you say "we" you are referring to NSW Health, but that has manifested into the Western Sydney Local Health District's centre for population health in this submission?

Dr SCALLEY: Yes, Western Sydney Local Health District is part of NSW Health. We have a number of local health districts, each of which has a public health unit or a population health unit, and the relevant local public health unit is the Western Sydney Local Health District.

Mr JEREMY BUCKINGHAM: NSW Health is making a health risk assessment and is assessing the health risk assessment undertaken by the proponent for the Next Generation facility out in Eastern Creek. What

standards does NSW Health rely upon and what is it comparing it to? Is there a national standard or an international standard for load and type of chemical when making these types of population-scale assessments of proposals?

Dr SCALLEY: Do you mean for the air quality impacts?

Mr JEREMY BUCKINGHAM: For all of the environmental issues that are outlined, including particulates, but in particular for air quality, what standards are used? I am sure that there is a range.

Dr SCALLEY: I might use the example of particulate matter, which is probably one of the really important air quality impacts. There are NEPMs, National Environmental Protection Measures. One of them is used for PM2.5, and it is often compared against. There is a yearly NEPM standard for that, and a 24-hour standard. The standards are not standards where we would say that below that level it is safe, because there is no lower threshold for which particulate matter does not have a health impact. In my opening statement I mentioned how international evidence shows that even if we were to improve air quality current levels to below the current standards, there would still be some benefit. The standards are an aspirational target, perhaps. They are not a level that you have for some substances, where you can say it is safe below this level.

We tend to look at the standards as a guide to cumulative impact, so the impact in an area over time from different industries and different factors. There is also what we call the incremental impact of a facility—imagine we looked at what the impact in terms of air quality is in an area and then what the additional impact would be from adding that facility into the area. We normally look at both the standards for an overall level and also the incremental impact. Using both of those we then consider the appropriateness of the facility. That is for PM2.5. There are lots of different guideline values internationally and in Australia for all different substances. I am not sure where I would start there.

Mr JEREMY BUCKINGHAM: On that point, is there a central repository for the standards or does NSW Health have to go out and cherry-pick different standards? Is there a standard for each of the issues, such as dioxins, particulates, ozone? How does NSW Health know which standard to use?

Dr SCALLEY: For most of the major substances concerning air quality, there is a NEPM level, such as the PM2.5 for the small particulate matter and PM10 for the larger particles. You mentioned ozone and for oxides of nitrogen, specifically, and a few others there are set Australian standards.

Mr JEREMY BUCKINGHAM: Who oversees, administers and sets those NEPM standards?

Dr SCALLEY: I think they are done at the Federal environmental level, but not by NSW Health.

The Hon. JOHN GRAHAM: That is for setting, but the question was about monitoring.

The CHAIR: Who monitors compliance?

Mr JEREMY BUCKINGHAM: Who has a role in regulating those standards and assessing risks?

The CHAIR: Who makes sure the levels are being complied with?

Dr SCALLEY: Answering that is a bit complicated in that the Environmental Protection Agency is the regulator for air quality in New South Wales. The person who monitors in New South Wales the ambient air quality impacts is the Office of Environment and Heritage [OEH]. Some monitoring is also done by the industry in different areas.

Mr JEREMY BUCKINGHAM: So the regulator is the EPA, but OEH does the monitoring?

Dr SCALLEY: They run the monitoring stations.

Mr JEREMY BUCKINGHAM: And feeds it back to the EPA?

Dr SCALLEY: All that information is publicly available.

Mr JEREMY BUCKINGHAM: Does it get fed back to the EPA as a matter of course?

Dr SCALLEY: Being from NSW Health, I am not sure I can comment on the relationship between the two agencies.

Mr JEREMY BUCKINGHAM: You said that to characterise their health risk you have to know what the outputs are and flowing from that you have to know what the inputs are to assess those against appropriate health standards. If you have a proposal for something new, including new types of feedstock or scale, you cannot do a proper health risk assessment, can you?

Dr SCALLEY: The health risk assessment is a process that often uses models of information to try to determine what the impacts of something would be and, not always but often, it is done on proposed things that do not exist yet. The fact that the proposal does not exist, does not stop a health risk assessment, and a good health risk assessment, necessarily being done. But it is the uncertainty surrounding all those things that I spoke about previously that is the issue with the health risk assessment, not that it would be using modelled, hypothetical or future issues.

Mr JEREMY BUCKINGHAM: But you cannot do the modelling in this case, because you do not know what is going in.

Dr SCALLEY: My understanding is that the concern with some of the EPA issues concerning the modelling that is used is that if you do not know what is going in and the feedstock, then modelling the air quality impacts coming out is not possible.

Mr JEREMY BUCKINGHAM: That is why the local health district [LHD] in its conclusion says that it is unable to fully determine the proposed facility's actual or potential impact on human health and therefore cannot be supportive, principally because the proponent cannot provide details of what will go into the facility. One of the things with that facility is that a large proportion of the feedstock for the waste from energy facility is put down as "other". Is this a grey area that NSW Health is prepared to live with? Our assessment is that in the order of 20 per cent of the feedstock is unknown. Could the health district accept that it will never know everything because of the uncertainty principle, but it can live with some level of uncertainty and factor that uncertainty into its modelling and still make a risk assessment that is robust and will protect the public interest?

Dr SCALLEY: I suppose we always live with some uncertainty. Often we use things like a sensitivity analysis—for example, for the situation you might model it based on a number of different waste scenarios. Often in health risk assessment we would use the worst-case scenario—say, all of the unknown waste came from the waste that would have the highest health impacts—and then work out what that would be. There are ways around uncertainty, and there are ways that we can make an adequate characterisation of the health risk assessment with some uncertainty. There are technical approaches to it. Having said all that, I think there is a lot of additional uncertainty that I have already mentioned related to this.

Mr JEREMY BUCKINGHAM: I assume these assessments are based on these facilities operating as they normally should. Does the health district do an assessment of a catastrophic failure, a fire or a disaster on a local level? That would mean having a LHD doing an assessment of the potential health impacts for a small population over a short period if something goes very wrong. These waste to energy facilities are large industrial processes that are complex. There are examples of them catching on fire. Would the health district do an analysis of the impact on human health of such a scenario?

Dr SCALLEY: It is important to point out that the health district does not do the analysis; it is the proponent who does the analysis. I think the environmental impact statement as a requirement from the EPA has certain worst-case air quality impact-type scenarios. I do not know what the characteristics and criteria are for those requirements. The environment impact statement [EIS] does include some assessment of when the plant is not functioning optimally what the greater impact might be.

The CHAIR: Can you clarify your comment "there are ways around uncertainty"?

Dr SCALLEY: I suppose I somewhat explained that, which is that in some situations what you can do is a sensitivity analysis. The example that was given was the 20 per cent waste being from unknown sources. If you have enough information there to be able to predict what would be the worst situation, say that came from the waste that has the highest of a certain type of substance, then you could include the worst-case waste where it all came from that and do that sensitivity analysis that way. That is a way to deal with uncertainty that is often used in health risk assessments, of a whole different number of health risks assessment we do. That is what I meant by that, but not all uncertainties.

The Hon. LOU AMATO: In your opening statement you said that the air quality in Sydney was good but it can still have effects. There seems to be a contradiction in terms there. Could you elucidate for the Committee what you mean by that?

Dr SCALLEY: What I mean is comparatively good.

The Hon. LOU AMATO: Compared to what?

Dr SCALLEY: To international situations.

The CHAIR: Like China? Exactly who?

Dr SCALLEY: To a number of cities across Europe and North America. We would have comparatively good air quality standards to most industrialised cities. But having said that, there are health impacts from our current levels, and there would be health impacts even if we improved it from the current situation because there is no lower threshold for which air quality impacts, from particulate matter specifically, at which they do not have an impact. If you keep improving until you get to zero, there will always be health impacts.

The Hon. LOU AMATO: Does your model in the Sydney Basin take into consideration different times of the year and different types of weather conditions? There are times of the year when the air in the Sydney Basin is still. Do you also take into account population projections when you are looking at your models?

Dr SCALLEY: I do not know what you mean by "models"?

The Hon. LOU AMATO: When you are comparing your standards.

Dr SCALLEY: The standards for particulate matter specifically are done on a daily basis or a yearly basis. On a daily basis they tend to be much higher standards and the yearly basis is somewhat of an average over the year. For example, there are certain seasonal trends in air quality that I think you mentioned.

The Hon. LOU AMATO: Correct, particularly south-west Sydney and looking out towards the Blue Mountains. In summer there is the threat of bushfires, which produce even more particulate matter.

Dr SCALLEY: Particulate matter can be seasonal, especially in winter with woodfire heaters. You mentioned stillness. In the middle of winter there tends to be inversion layers that trap.

The Hon. LOU AMATO: Because it is a lot heavier.

Dr SCALLEY: It traps at low levels so the air quality impact can be higher. Stillness in summer is also important for ozone. Ozone generation at ground level requires still air for the mixture of the pollutants and ultraviolet light. Still summer days can be quite important for ozone generation as well.

The CHAIR: Do you do modelling on the influence of climate change or considerations of projected climate change?

Dr SCALLEY: The Office of Environment and Heritage runs a system that projects what a number of different factors will be into the future from different climate models done in partnership with I think some university groups. I am not sure if that work has been done specifically or not. It would probably be best to address it to them.

The Hon. SHAYNE MALLARD: Air quality and concerns around that has been very much the focus of the discussion and the presentations from the community when we have been at Blacktown. I was interested in your statement that there was generally good air quality in Sydney. You cannot apply that equally across the entire Sydney metropolitan area I would not think, being from Western Sydney myself. The Committee has heard that the applicant has had some well-regarded consultants do work on their emissions and air quality questions. I asked questions of AECOM regarding the work they had done and, paraphrasing, they said there were no increases in emissions in their modelling. Does your area test the work that is done by their consultants, the environmental impact statement, or does the Environment Protection Agency?

Dr SCALLEY: By "test" would you mean assess the validity?

The Hon. SHAYNE MALLARD: Test the validity, the work that they have done.

Dr SCALLEY: For the health risk assessment side, going from the emissions to what the health risk would be, we do definitely look at that. I think the issue here is more about the certainty of what the air quality emissions will be. It is more the EPA side of it.

The Hon. SHAYNE MALLARD: How could the consultants do the modelling on receptors—which we learnt were people—in the locality of the proposed facility? How could they do the modelling when they do not know the inputs, which is back to Mr Jeremy Buckingham's line of inquiry?

Dr SCALLEY: Once again, the issue with health is with that uncertainty. Until we have greater certainty about what the potential emissions could be and more certainty around that, we cannot comment on the health risk, be they, I think you used the word "minimal", or not.

The Hon. SHAYNE MALLARD: Surely any increased health risk is unacceptable for you as a health practitioner?

Dr SCALLEY: NSW Health is always very keen to minimise any health risks from any development.

The Hon. SHAYNE MALLARD: Particularly in a community that already has, as you said in your statement, higher levels of cardiovascular lung disease. NSW Health would have an obligation to try to protect that community from further deterioration of their health.

Dr SCALLEY: We are always keen to minimise. However, I think we have to consider the health impact rather than the health risk because the health impact is a bit broader. I am not commenting specifically here on any one development, but sometimes development also has health benefit more broadly. If a development had a small health risk but also brought in a health benefit through other means, be it employment or other improvements across society as a whole, there might be some health benefit that is very large with an extremely small health risk. In those situations there might be a risk to consider.

The Hon. LOU AMATO: What about carcinogens? How do you know what is going to come out of that when roughly 20 per cent is unknown? How are you going to know the impact?

Dr SCALLEY: And that is the issue. Because we do not know what is coming out, assessing the health risk from a number of these different substances is not possible.

The Hon. LOU AMATO: It is not possible to determine the health risk to the population because you do not know what is going in, you do not know what is coming out.

Dr SCALLEY: Yes, that is true.

The Hon. SHAYNE MALLARD: We had evidence from other operators in the United Kingdom [UK], particularly, operating similar operations of about 20 per cent size in the heart of Paris and in the middle of the UK near the populations where the waste is generated. You mentioned the balance and other benefits. Surely they must have addressed the health impacts in those examples. The European Union [EU] regulations are pretty stringent.

Dr SCALLEY: I could not comment on those other facilities, but the crux of what I am commenting on is the way that the EIS for the Eastern Creek facility was justified, and also really leaning on the EPA's view; that is, we do not know what the emissions will be from this facility, therefore we cannot determine the health risk.

The CHAIR: Thank you very much Dr Scalley. You have given us some very helpful evidence. If we look through it and determine we have some more questions, we may put those on notice. The team will help you with that and you will have 21 days to answer them. I do not think you took anything on notice during the evidence. Thank you for your presentation. It will be very helpful for us in further consideration of this report.

(The witness withdrew)

ADI PRASAD, Environmental Consultant MRA Consulting Group, affirmed and examined

MIKE RITCHIE, Managing Director of MRA Consulting Group, affirmed and examined

The CHAIR: Would either of you like to present an opening statement?

Mr RITCHIE: Yes, please. Hopefully the Committee members would have received our submission. I will take a few minutes to outline MRA's position. MRA is a public policy adviser to a number of technology providers in the industry. We advise government, the NSW Environment Protection Authority, industry technology providers and local government, so we are a full service adviser around the waste and recycling sector. New South Wales is one of the best recycling States in the country. Its recycling rates are up to 65 to 70 per cent. While it has the largest recycling sector in Australia of about 11 million tonnes of product put back to the productive economy, approximately seven million tonnes still goes to landfill each year.

I am sure the Committee is aware that that breaks down into household waste, commercial waste and construction demolition waste. For the household waste, there are only two landfills in Sydney, Lucas Heights and Woodlawn, which some 200 kilometres from Sydney. We are now restricted in terms of municipal solid waste [MSW] disposal to only two landfills. One of the considerations for the Committee is that, in particular, there are a limited number of disposal options for municipal waste. The industry has been arguing for a long time that a move into energy from waste opens up that market and creates more opportunities for energy recovery but also for disposal of waste that would otherwise be destined for landfill.

In that regard, in 2015 the New South Wales EPA established the Energy From Waste Technical Working Group, of which I was a member, along with one of my colleagues, Ron Wainberg, who you heard from at the last sitting of this Committee. Out of that arose the New South Wales energy from waste policy. That policy has three fundamental principles built into it: One, do not cannibalise recycling; in other words, maintain the recycling sector we have and create the impetus for continuing to grow recycling in New South Wales; two, meet group six air emission standards, or best practice air emission across the world as applied in New South Wales; and, three, be a bona fide energy generator; that is, you are not there simply to dispose of waste. Those three principles underpin the energy from waste policy and every applicant that puts forward a proposal needs to prove that they meet those three tests.

I have been involved with the development of energy from waste policy, and I certainly endorse those three principles. I might talk later, if the Committee wants to, about how table 1 in the energy from waste policy could be reformed. It is still a little lacking, and it has some uncertainty built into it, which we can talk to. Fundamentally, the energy from waste policy that the NSW EPA created is the best and most detailed energy from waste policy in Australia, without doubt.

I make a couple of other points. Any proposal for establishing infrastructure in New South Wales is currently being heavily undermined by the movement of waste to Queensland. I am sure you have heard about that, with $10 disposal in Queensland, the arbitrage opportunity for moving waste out of New South Wales to Queensland is certainly not the fault of the waste industry. I have used the analogy of Townsville banana farmers moving their bananas to the Sydney market. It is not their fault that they get paid more or save money by shipping to Queensland. It is an abject failure in public policy. I sheet that to the Queensland Government who removed the $35 landfill levy, which was the arbitrage value that we are currently seeing. It has probably grown to a $40 or $50 arbitrage value now.

There are two quick solutions I will put on the record. The first is that the Queensland Government reintroduce a landfill levy, which is by far the most appropriate because it would stimulate further recycling business in Queensland, which is poorly serviced at the moment, and has a poor recycling record. Secondly, that this Committee consider attaching the levy liability to the waste itself, so it does not matter where you send the waste, the liability is sheeted back to the New South Wales Government and Treasury. That small change could fix the arbitrage and the loss of tonnes to Queensland immediately. I personally say that the arrangements with the levy and loss of waste to Queensland is as big an issue, if not a much bigger issue, as the energy from waste discussions that you are having specifically today. I would add that the levy in New South Wales, if you want to grow recycling further, needs to increase over time. We would say by $1 to $2 per year per tonne and that that be hypothecated to the kinds of issues you are dealing with today—better data, better regulation and better enforcement. I would encourage the Committee to look at continuing rises in the levy as a strong market signal to improve recycling and to bring on new technologies.

The waste industry has the ability to abate about 57 million tonnes of Australia's greenhouse gas emissions, or 9 per cent, and it can do that in two primary ways: one, by recovering materials back to the productive economy and reducing emissions from all those other industries—take aluminium or glass as a case in point. Secondly, in a move to energy from waste, it can avoid the burning of 48 million tonnes of coal and thereby reduce Australia's emissions by the net of the direct emissions from burning waste offset against the savings in burning coal. The net effect is about a 9 per cent saving in Australia's greenhouse gas emissions and we would say that energy from waste has a major part to play, as does recycling, in abating Australia's greenhouse gas emissions. I made the point earlier that there are only two landfills left in Sydney for municipal waste. The Committee needs to consider any energy from waste policies in the context of the "do nothing" option and particularly the opportunity cost of building another landfill for municipal waste in proximity to the city.

A couple of final comments and I am happy to take questions. You will have noticed that the data you are working with is 2010-11 data. That is a very serious issue for the waste sector. The EPA has this data, it is just not on the public record. We have been calling for many years for the Bureau of Statistics to play a better role in bringing that data together so that committees such as this one are dealing with 2017 data and not data that is six or seven years old. You will have heard from some of my colleagues about the need for an infrastructure State environmental planning policy [SEPP] or some kind of planning measures to facilitate infrastructure. As you heard from the previous speaker, at the moment all infrastructure is developer-driven or applicant-driven. There is no overarching State plan for waste infrastructure, whether that is energy from waste or landfills. The physical placement of the infrastructure is a reactive process that is developer-driven and, in my view—and in the view of most of the industry. I see a role for the State in establishing a State infrastructure SEPP for waste. Some will say it should be an essential service and treated as such. I will leave that to yourselves.

What we do need to be very mindful of is firstly the erosion and loss of buffers around existing infrastructure—that is issue number one. Issue number two is the facilitation of new infrastructure. We need about $5 billion worth of investment per year across Australia in infrastructure in waste, at least $2 billion of that in New South Wales. That is a major employment opportunity. These are green collar jobs. We need to facilitate that kind of infrastructure growth, particularly if we are trying to grow recycling above its current 70 per cent towards 80 per cent. These are long-term green collar jobs and the State has a key role to play in facilitating that via some kind of planning arrangements.

Some of my colleagues have spoken about the broad opportunities for energy from waste. I will quickly outline the three. There is thermal treatment of waste, which you are considering in respect of the Dial A Dump application—mass burn incineration or thermal treatment of waste. The second is gasification, which is heating waste with limited amounts of oxygen. Pyrolysis is the one I really want to turn to. It is heating waste in the absence of oxygen. Pyrolysis is interesting because it is the only technology we know that can convert timber or lignocellulosic waste from volatile timber back into stable carbon. We can plough that carbon back into land and sequester atmospheric carbon dioxide back into land as biochar via the pyrolysis technology.

It is the only technology we know of that can be commercialised to actually reverse climate change by sequestering atmospheric carbon dioxide back from trees and back into land, and in doing so also add nitrogen, phosphorus and potassium [NPK] to it and create a fertiliser for farmers. It has incredible opportunity. What it is lacking at the moment in the energy from waste space is research and development [R and D] funding. In the context of an energy from waste inquiry, I would hope that you would explore pyrolysis as one of those next-gen technologies that really needs State and government engagement, particularly in the R and D space. I will leave my introductory comments there. I am happy to take questions.

The Hon. JOHN GRAHAM: Thank you for your submission. You have given us a real overview of some of these issues. On the broad policy questions that you have raised you have largely endorsed the existing New South Wales policy in strong terms, but you referred to some uncertainties within that. What did you mean by that?

Mr RITCHIE: At the back of the policy—I am sure all Committee members have a copy of it—is table 1. Table 1 refers to the inputs and outputs from processing facilities. The first is that the processing facility per se is not defined in the policy at all, so it is very unclear for an applicant to know exactly what a processing facility is and whether it has to do maximum sorting of waste or minimal sorting of waste. It is unclear what its purpose actually is, except that all processing requires material to have gone through a processing facility, except for source-separated streams.

If you are talking about mixed waste, which is essentially what we are talking about, it must go through a processing facility and it is unclear what that facility needs to do to it. It might lift one plastic bottle and constitute a threshold test. It is unclear until an applicant puts an application in front of the Environment

Protection Authority as to what the EPA intends to do with those threshold tests. We have sought for a couple of years now for the EPA to release a document. I understand they have either done or commenced work on defining the processing facility. That is one that certainly needs to be released because otherwise you see applicants coming before the Department of Planning and Environment with applications that might reference that facility in different ways.

The second is that the thermal treatment limits established in the policy—the 40 per cent, 25 per cent or 100 per cent threshold tests—relate to the input material to a processing facility not the output material from that processing facility. They are all, if you like, reversed. They talk about a percentage of the input tonnes as opposed to a percentage of the output tonnes. It would make more sense if the processing facility were clearly defined as to what its minimum standard was—let us say 75 per cent of available recoverable recyclables have to be pulled out by the processing facility and then a percentage of the residual coming out the back of that facility can then be thermally treated. That would make a lot more sense. I think the reason it was done this way was that there was no definition of a processing facility and there were no minimum standards for these types of plants, so therefore the only number that the EPA could hold onto was the input tonnage.

The Hon. JOHN GRAHAM: Thanks. That is useful. I want to turn to this question you have raised about data. I think your views were helpful on that question. Both for the industry and for committees like this it would certainly be helpful to have more up-to-date information. What is the stated reason for that not being the case?

Mr RITCHIE: In New South Wales, partly a robustness test or a verification test to go back to local government, who are one of the suppliers. Two years ago with the waste regulation reform in New South Wales the EPA required all licensed facilities to supply real-time data to the EPA. That is a major step forward. Having said that, unlicensed facilities are not required to report, small landfills are not required to report and local government does only a voluntary report.

The Hon. JOHN GRAHAM: But why can we and the public not know the information held by the EPA?

Mr RITCHIE: If the verification period was a year or two, and I think one year would be reasonable, then in my view there is no reason you should not have that one year after it is received.

The Hon. JOHN GRAHAM: Thank you for that. I want to turn to the specific proposal out at Eastern Creek that you have briefly referred to. We received evidence this morning about the importance of the feedstock to proposals. I think you were present as the view was put by NSW Health that, for their purposes and also for the purposes of the EPA, knowing what goes into that feedstock is pretty fundamental. Do you have any views you would like to put to the Committee about the feedstock for that specific proposal?

Mr RITCHIE: I do and I just need to make a short declaration that I have done some work for the applicant, more recently with requests from the EPA and the Department of Planning and Environment for more detailed information around the application of the energy from waste policy to that facility. MRA has been doing some work on that. I will obviously declare that and steer clear of confidential information.

The Hon. JOHN GRAHAM: That is appreciated.

Mr RITCHIE: But in broad principle, the energy from waste policy is unclear in terms of its approach to what waste goes into facilities. It talks broadly in terms of the municipal solid waste [MSW], commercial and industrial and construction and demolition streams and a limited number of source-separated streams such as tyres or wood waste. The Committee needs to be clear that when you are talking about commercial and industrial waste you are not defining a particular waste type or characterisation—you are talking about a broad suite, a stream or a river of waste, if you like, mixed up with all sorts of different materials in it, whether that is rock, stone or rubble and timber in the case of construction and demolition waste and piping or whatever through to MSW, which has obviously food and similar waste streams in it.

To go to the level of specificity that the previous witness was talking about is not realistic in the context of a large-scale processing facility. They are just not going to sort those kinds of tonnages, and nor do they for most facilities around the world unless you are talking about refuse derived fuel or process engineered fuel [PEF], where those streams have specifically gone through a processing facility to create a thermally known characterised bale of material. If you are talking about a general energy from waste facility that is, if you like, a mass process, it is receiving what it receives.

The EPA has taken the view—rightly, in my view—that it needs to ensure that the process is capable of treating any waste stream with certainty rather than relying on an applicant to clean up a particular stream in a particular way every day without failure because the technology is specified to that particular waste stream. The

EPA, if you like, has erred on the side of caution, not just in respect of this application but all applications across New South Wales for anything to do with waste to say the technology needs to be robust enough that it does not require a high level of specificity at the front gate to ensure that the technology is suitable. It has to be robust enough that it can handle it.

The Hon. JOHN GRAHAM: Which, particularly for a project of this scale, sounds like the appropriate approach.

Mr RITCHIE: Correct. Because you do not want to know, and the EPA cannot guarantee, that a particular individual who is pulling piping at the front of that facility happens to have been trained right and did not go off on a sickie on Tuesday and was replaced by someone who did not know.

The Hon. JOHN GRAHAM: My question to you, though, is this: This is a very large-scale project. The feedstock matters. How much of this feedstock is tied down at the moment of the 1.2 or 1.3 million tonnes that we might be talking about?

Mr RITCHIE: The original application was not particularly well defined. But I can state to the Committee that the Department of Planning and the EPA have sought further information in respect of the particular material streams and how they fit specifically with the criteria outlined in the energy from waste policy—a general principle. But you go to a point, though, in that debate where you are asking an applicant to know exactly from whom they are contracting the tonnes, and that is one point too far because we do not require that of any other applicant for any other development in New South Wales.

The Hon. JOHN GRAHAM: One of the other points you have made in your submission is that this is a competitive market. There are other people chasing this feedstock as well.

Mr RITCHIE: Correct.

The Hon. JOHN GRAHAM: That is a factor here, is it not?

Mr RITCHIE: Correct. There is a balance in there for the Committee. You cannot seek 100 per cent or absolute certainty about feedstocks. By the way, even if you were, you would be securing a stream, not a feedstock in terms of known characterisation. I make that point again. Even if you know that it is coming from ABC Proprietary Limited and it is a mixed stream, you do not know what is in it.

The Hon. JOHN GRAHAM: Yes. I want to ask you about this on the feedstock question. We have had two views put to the Committee about the feedstock: firstly, that what goes in to the feedstock is fundamental to what comes out; and, secondly, and this is the view of the company, no, the content of the waste is not important. With which of those two views do you agree—the EPA and NSW Health, or the company's view?

Mr RITCHIE: I am not sure I would characterise the last point is being the EPA and NSW Health versus the company. I would say this: The EPA always has resolved to build technology that is robust enough to handle any waste stream, irrespective of whether or not on a particular day a particular material finds its way into that load, because you are talking about a bin that is out the back of a company with people that are not trained to put particular waste in particular bins. That is the reality of the waste stream with which you are dealing so the technology has to be robust enough. If you want to talk about some plants around the world that limit, for example, polyvinyl chloride [PVC[or chlorinated wastes, that would always be an advantage to reduce the risk of furans and dioxins coming out of it. But most technologies are built be robust enough that they can handle the normal loads of those materials.

The Hon. JOHN GRAHAM: Chair, I might just finally ask the witnesses view on the Queensland waste levy. Thank you for your evidence. I think that was helpful for the Committee. On your second proposal to deal with this—option one is the Queenslanders fix this and option two is that we attach the levy to the waste—can you give us any information about how legally sustainable you think that approach is, given one of the real issues here is the constitutionality of the New South Wales approach?

Mr RITCHIE: The proximity rule was an attempt to limit the transport of waste more than 150 kilometres. The Government decided when it was likely to go to court not to take that action in the court to enforce the proximity rule. We now have a strange situation where the proximity rule is on the statute books but the agents within the EPA have said that it is not being enforced. We are trying to advise clients as to whether it is actually a statute or it is not and where to make their commercial decisions. That is a very difficult situation. We need to resolve that urgently.

We are also losing 600,000 tonnes, potentially 1 million tonnes, of waste out of New South Wales to Queensland, which is not available to bona fides recyclers in New South Wales. We definitely need to fix it. As

I said, the simplest is for Queensland to have its own levy. That way you do not interfere with the section 92 proposal.

The Hon. JOHN GRAHAM: Yes, understood. I am asking you about the second proposal.

Mr RITCHIE: If you attach that the levy liability to the waste, as long as the statute is built in such a way that it does not matter where the waste is disposed of. If it is disposed to landfill or the moon for that matter, then the liability arises with the person who sent it and that person cannot absolve themselves of liability. We believe, and all the evidence is, that that satisfies the section 92 constitutionality issues.

The CHAIR: I just want to ask a quick question. In relation to legacy landfill, is there an opportunity to go and dig that back up and put it through energy from waste?

Mr RITCHIE: There is.

The CHAIR: Have you looked into that and what the implications of that would be?

Mr RITCHIE: The implications are that the technology is fairly well known around the world. The EPA has a policy that digging up and exhuming old landfill waste is not appropriate. To date they have said, "We're not going to allow the exhumation of waste in New South Wales." There are good health reasons for that. A lot of waste in New South Wales is contaminated by asbestos when it goes into the ground, so there would be quite significant occupational health and safety [OHS] issues too.

The CHAIR: So let sleeping dogs lie?

Mr RITCHIE: In my view—unless there is another environmental reason for digging it up, such as that it is leaching or it is causing environmental harm. Then I would take that point.

Mr JEREMY BUCKINGHAM: Mr Ritchie, thanks for your evidence this morning so far. It has been very interesting. One of the fundamental reasons New South Wales and other jurisdictions are looking at energy from waste is because of the issue of climate change, and governments, communities and corporations are seeking to reduce greenhouse gas emissions. Yes?

Mr RITCHIE: Yes.

Mr JEREMY BUCKINGHAM: You have stated in your submission and during your submission today that you believe the net effect of energy from waste could be a reduction of up to 46.7 million tonnes of CO2 equivalents per annum in Australia. That is based on an 11-year-old report from SITA and it is based on the presumption that we will continue to burn coal, is it not?

Mr RITCHIE: Yes. The biggest gain is the offsetting—is coal emissions.

Mr JEREMY BUCKINGHAM: That is right. The 46 million tonnes effectively is from offsetting coal. But actually, if you look at that report, the impacts in terms of CO2 equivalents [CO2E] from burning coal is actually an increase as opposed to landfill of 1.8 million tonnes per annum, is it not?

Mr RITCHIE: I am sorry. Restate that for me, if you would.

Mr JEREMY BUCKINGHAM: The report said that if we put some of this waste to landfill—the seven million tonnes of various waste streams—it would actually mean there is less CO2 going into the atmosphere than would be the case with burning it.

Mr RITCHIE: If you do not take into account the offsetting of coal, then you are having half a debate. But I take your point. What happens when you put organic waste into landfill? It decomposes in the absence of air and generates methane. Methane has a 25 times carbon forcing effect than is CO2E. So methane is a very potent greenhouse gas—very potent. It is one of the highest.

Mr JEREMY BUCKINGHAM: Yes, but your modelling says that if you put it on the ground, it is 12.1 million tonnes per annum. If you burn it, it is 14.8.

Mr RITCHIE: Correct.

Mr JEREMY BUCKINGHAM: By burning it and setting aside the coal, the actual net effect is an increase in greenhouse gas emissions.

Mr RITCHIE: If you do not take into account the coal offsets—

Mr JEREMY BUCKINGHAM: Then burning it increases greenhouse gas emissions.

Mr RITCHIE: There are two points to make there. In the broad maths, yes, you are correct. If you burn the waste it has a net CO2E emissions of about 14 million tonnes. If you put it in a hole and you bury it, it

generates methane, of which we capture in New South Wales about 50 per cent of all methane that comes out of landfills. So the net effect of emissions is 12 million tonnes.

Mr JEREMY BUCKINGHAM: That is right, but you have localised that. You could drive that further down.

Mr RITCHIE: The industry has been particularly good. Most of the CO2 abatement in Australia that has happened from the Carbon Farming Initiative has been why 60 per cent of all projects have been waste.

Mr JEREMY BUCKINGHAM: Effectively, are you saying that if you disregard the offsetting, burning the waste streams actually increases CO2 equivalent emissions to compared to landfill?

Mr RITCHIE: On the maths, yes, but I do not understand how you can offset the coal burning.

Mr JEREMY BUCKINGHAM: Because you go to renewable energy. In the past four years, New South Wales has already reduced the coal it is burning by 25 per cent. So we are burning only 20 million tonnes per annum now. What is the lifetime of these energy from waste facilities? How long will the Eastern Creek one be operating?

Mr RITCHIE: Somewhere between 30 and 50 years, depending on how often it is refurbished. There are modular technologies inside, so the shed does not need to refurbished very often. You would expect some sort of upgrade of the technology every 10 years. It could be there for 30 to 50 years.

Mr JEREMY BUCKINGHAM: There are serious jurisdictions around the world that have already moved away from burning coal, and a lot of the science is saying that we have to move away from burning fossil fuels by 2030. So if you disregard the offset issue, then, effectively, by going to energy from waste, you are locking in a technology for 50 to 60 years and that will be increasing CO2 emissions, are you not?

Mr RITCHIE: I would posit it in a slightly different way. The Government has said it wants to reduce organic waste to landfill massively; we need to get food waste, timber and paper out of landfill. That will have the effect of reducing the 12.8 million tonnes of CO2 emissions from landfills, because we are putting less organic waste into landfill. That is a big tick from both industry and the environmental movement. Yes, we need to get organics out of landfill. Separately, we have 7 million tonnes residual waste that is either going to landfill, as it does now, or could go into energy from waste facilities.

Mr JEREMY BUCKINGHAM: No, that is not true, is it? Because it could be reprocessed. Your hierarchy of wastes says that the number one thing is avoid and reduce, and the second one is reduce and recycle. It should go through that. It is not an either/or proposition. It is not that we landfill it or burn it; we could re-use and reduce it, could we not?

Mr RITCHIE: The Government's policy is to try to grow the 70 per cent up to 80 per cent. It has established an 80 per cent target.

Mr JEREMY BUCKINGHAM: But if we lock in a technology that is burning it, that is not going to happen, is it?

Mr RITCHIE: With respect though, the Government's policy says you cannot burn recyclables. The energy from waste policy says you can burn only the residual of residual waste.

Mr JEREMY BUCKINGHAM: Yes, but that comes down to what you determine to be residual. If you have high levies and you have not got this energy from waste technology, then you create the incentive for people to decide, firstly, that they will not make the waste, and, secondly, that they will find a re-use for it. That is a statement. What is your view on the Eastern Creek proponent's facility taking waste directly from the source and not sending it through some form of materials recovery?

Mr RITCHIE: It cannot under the energy from waste policy. The energy from waste policy requires mixed waste, including municipal solid waste, commercial industrial waste, and construction demolition waste, to go through a processing facility. That is the definition of how mixed waste finds its way into an energy from waste facility. It is only source-separated materials, and there are very limited streams where it can go directly. I make this point generally, not about this application, but, by and large, the waste that would go into any energy from waste facility has gone through sieves or filters to ensure that recyclables cannot find their way, or a very small proportion if there were any, from a generator into an energy from waste facility.

I would encourage the Committee to make exactly the same rules about landfill. We are establishing a very high bar for energy from waste facilities not to cannibalise recycling, but we do not have anything like the same controls on waste going to landfill. The EPA has started to look at minimum standards for construction

and demolition processing. In my view, those are the kinds of things that the Government should do more of, in respect of waste that is going to landfill.

Mr JEREMY BUCKINGHAM: With respect, Mr Ritchie, I have limited time and there may be other questions. The Eastern Creek proposal does not have a sieve or a filter; it takes waste from the generator and goes directly to the proposal and the tipping bay, where construction and demolition waste and commercial waste are tipped directly into it.

Mr RITCHIE: That is not correct.

Mr JEREMY BUCKINGHAM: You are saying that is not true?

Mr RITCHIE: Correct.

Mr JEREMY BUCKINGHAM: According to the New South Wales energy from waste policy, or according to your understanding of the proposal?

Mr RITCHIE: I am not going to speak specifically to the proposal.

Mr JEREMY BUCKINGHAM: I am across the detail of the proposal, and that is what is being proposed. You think it is in breach of our policy.

Mr RITCHIE: I will give you some examples. The waste streams that are going into the facility are X processing yards and construction and demolition processing yards, such as Benedict Industries and construction sites. Most of them are from processing yards, and it is the residual of the processing yards. There is a debate, which we have led to the EPA, about onsite processing. I made the point earlier about what constituents a processing facility. We raised with the EPA the question that when you are demolishing the IMAX theatre and you have someone sorting concrete and steel into piles, and some residuals have to go to landfill, does that constitute a processing facility.

The EPA has said it might, subject to us providing the evidence. We said that that was unclear and the EPA needed to be much clearer. In that regard, in that limited number of circumstances it might constitute material coming from a generator going into a thermal treatment plant, but that is a very limited pool. The vast majority of them must go through a processing facility. In the case of the applicant, he talks about the Genesis facility, which is a processing facility that generates residual that would otherwise go to landfill. Under the policy that is eligible to be thermally treated.

The CHAIR: Order! We are not here to do development application approval on this proposal. It is not in the terms of reference. The witness is making it very clear he does not want to go anyway near the particular proposal Mr Buckingham is talking about. He has made it very clear that the evidence he is giving is according to what he is here to give. We will not go down that line. We need to move on. Mr Ritchie, you are free to answer the question, but I want to err on the side of caution by saying that we are not here to discuss a particular proposal.

Mr JEREMY BUCKINGHAM: We are.

The CHAIR: The member might be, but that is not in the terms of reference.

Mr RITCHIE: Any waste facility is required to have a processing facility upstream in order to receive any mixed waste. By definition, mixed waste includes the three streams we talked about. That is how the energy from waste policy works. There is a question about some onsite processing and whether that constitutes a processing facility. That matter has been taken up with both the EPA and the Department of Planning and Environment.

The Hon. SHAYNE MALLARD: The conversation was very helpful and enlightening in terms of the policy. |In your submission you state that there is an estimated 1,000 energy from wastes plants operating around the world. You boldly state that they do not cause air or water pollution if operated under the European Union standard. Then you talk about opportunities for councils, singularly or together, to develop an energy from waste facility for their community to deal with waste from the community and to produce energy for the community. Please talk about the standards and the current status of those facilities in Europe, as well as the local government opportunities.

Mr RITCHIE: The waste incineration directive and the European standards for incineration emissions are the benchmark for the world. Most places have adopted them and the New South Wales Government originally looked at using the waste incineration directive and the emissions standards for the New South Wales policy. The Government then decided to use the Group 6 air emissions standards for New South Wales, which

are an equivalent standard and equally robust. I have no problem with the standards being set. It is then up to the technology to prove its merits in meeting that high bar. I think that is perfectly appropriate.

I was recently in Tokyo, and there are 26 incinerators or mass-burn facilities in downtown Tokyo that are owned by the Tokyo Authority and regulated by the Japanese equivalent of the EPA. There are 26 of them right within the confines of the city centre. I think these technologies are very well developed and robust. That is not to say there were not historical problems with a limited number of thermal treatment plants. I am not an apologist for the thermal treatment plant industry, but I would say that the technology is very robust—for example, there are six in downtown Paris.

I do not think the technology per se is the issue afoot, so long as the appropriate regulations and controls are put in place by the EPA. There are more arguments around the input materials and the policy and threshold tests. I think they are very valid arguments that we can apply to recycling. The EPA has gone a long way, certainly further than any other State, to establish a high bar for inputs in terms of potentially impacting the recycling sector.

The Hon. SHAYNE MALLARD: You referred to mass incinerators in Tokyo. Are they the end result of the recycling process burning bulk waste?

Mr RITCHIE: Yes, the recycling facilities in Japan are very limited—from memory there is about 20 or 25 per cent recycling as compared to our 70 per cent. We are really talking about burning what I would call the residual of the residual. Not only is it residual waste that was otherwise destined for landfill but then it has to go through another process, called a processing facility, so that only the residual of that process is legitimately burned.

The Hon. SHAYNE MALLARD: You talk about the benefit of less truck movements if local government in New South Wales were to go down the path of building such facilities in their communities and so forth. Would the waste still have to leave the community and go through the recycling process, as at Genesis, and then the residual go back into the community to be incinerated?

Mr RITCHIE: Or that processing facility is part of the application, just built as part of the front end of the facility. In most of Europe, it is the regional organisations of councils that purchase these facilities, provided by the private sector but contracted by the communities as an alternative to landfill. The Committee needs to keep that in context: This is as an alternative to landfill that the residual was otherwise destined for.

The CHAIR: We took some previous evidence that Europe is shutting down these facilities and not building new ones. Is that correct?

Mr RITCHIE: No, for example, I just saw three brand-new retrofitted facilities in Japan.

The CHAIR: But that was Japan and not Europe.

Mr RITCHIE: Europe is upgrading and retrofitting. The technology inside these things is modular, so it can be retrofitted regularly, and they are retrofitting regularly.

The CHAIR: Please walk us through the New South Wales graph in your appendix A.

Mr RITCHIE: These are some analytics that MRA did of the relationship between a levy and recycling rates. What it clearly demonstrates is the correlation between them, albeit with a lag. There is a definite lag, which is of the order of four to five years, which we think is the infrastructure build time. It is the work on the internal rate of return [IRR] on balance sheets in boardrooms followed by going out to get approval, and then it takes five years to build anything of substance in New South Wales.

The Hon. JOHN GRAHAM: I thought these figures were really helpful.

Mr RITCHIE: You will see these figures were dated back to 2013-14, which was the most recent data we could get out of the State EPAs. Essentially, it shows that there is a very strong correlation between higher price signals in the market and diversion of waste from landfill. Waste is like a river: It flows downhill until it finds the cheapest price to be disposed of. In this case it is Queensland, so it is worth shipping waste 1,000 kilometres to find a cheaper disposal price. It is testimony to the rule that waste goes down to the cheapest price. The levy is the single most effective instrument anywhere in Australia, and particularly in New South Wales. We would be having recycling rates of 40 per cent right now if we did not have a levy.

The Government is to be congratulated on keeping the levy, but in my view it needs to inch upwards, not in any dramatic way but it needs to continue to send a market signal, particularly in respect of commercial waste. We do not have any big commercial sorting facilities, so that material is going to landfill right now. The IRRs and the returns on capital are just not there yet; we are very close, but unless the levy continues to go up a

little bit, companies cannot make a return by building big sorting facilities for commercial waste. That is the next big gain in terms of recycling rates in New South Wales.

The CHAIR: I am sure you would be familiar with the statistics for the Shoalhaven City Council. Over four years the council has paid to the EPA a levy of $33,352,268 and the non-contestable grant received through the EPA levy grant system is $955,355 with contestable grant funding received of $780,597. That means that only 5.2 per cent of the levy paid was received back from the EPA. Would you say that if you really want to divert waste from landfill one system would be to hypothecate those funds to local councils to build resource centres to separate and deal with waste in their local areas?

Mr RITCHIE: Absolutely yes. If you are asking me whether there should be high levels of hypothecation, the answer is definitely yes. One question we need to ask is: Hypothecating what? Local government only pay one-third of the levy contributions, so 100 per cent hypothecation means that for every dollar local government put in they would get back $3. I do not think that is what local government is arguing; I think they mean 100 per cent of what they pay, which would $30 million for Shoalhaven. Yes, that should be 100 per cent hypothecated, in my view. As I understand it, it is about 60 per cent at the moment. In my view, they should go to 100 per cent.

Of the total pot of the levy, though, I think it is legitimate that a higher percentage of the total pot be hypothecated back, particularly to enforcement—we will all see *Four Corners* tonight, which is about enforcement or the absence thereof—policy making and facilitating infrastructure. It is impossible to build a large piece of commercial waste recycling kit in New South Wales right now; you just cannot make the return on it. A decent capital grant would bring that technology to the fore and employ lots of people. I think there is a very strong argument for both local government hypothecation being higher, approaching 100 per cent of their money, and a higher percentage of the total pot, in my view approaching 50 per cent, back to enforcement and infrastructure.

The CHAIR: In light of your evidence, we might put some questions on notice—I know Mr Jeremy Buckingham has some further questions. You have 21 days in which to respond to any questions, and the secretariat will help you with the process. Your knowledge of these matters is incredible and will be very helpful to us in writing our report. Thank you for your participation this morning.

(The witnesses withdrew)

(Short adjournment)

CHRIS DERKSEMA, Sustainability Director, City of Sydney, affirmed and examined

GEMMA DAWSON, Manager Waste Strategy, City of Sydney, sworn and examined

The CHAIR: Would either of you have an opening statement you would like to make?

Mr DERKSEMA: Yes, I would like to make an opening statement. Thank you for the opportunity to address the Committee on this important topic this morning. As a council committed to environmental leadership we felt it important to provide a written submission and be available for this hearing today. The city has strong waste and diversion targets for 2021 in line with the New South Wales Waste Avoidance and Resource Recovery Strategy 2014-21 and a zero waste target for 2030 consistent with the waste hierarchy of avoid, re-use and recycle. However, council has also adopted an advance waste treatment master plan for energy from waste reflecting our view that zero waste targets cannot be achieved without an energy from waste solution, or at least without unintended consequences such as shipping waste overseas to avoid landfill.

The city supports the New South Wales Government's current energy from waste policy statement that energy from waste can be a valid pathway for residual waste where further material recovery through re-use, reprocessing or recycling is not financially sustainable or technically available. But in order to facilitate energy from waste as part of an integrated resource solution for Sydney with community support we believe there are a number of broad issues that must be addressed. Firstly, we believe that waste management would be best planned for on a metro basis and suggest the development of a Sydney metro waste plan. At the highest level this plan should identify Sydney's role in achieving the current New South Wales State waste targets, set new targets beyond 2021 and clearly define the measures and actions required to achieve stated goals.

While the city supports the current New South Wales waste avoidance and re-use recovery strategy, we believe that the State should consider a metro based approach due to a number of factors, such as the concentration of waste generation, the need to manage resources at the point of generation to facilitate a more circular based economy, and in addition to address some of the governance issues that inhibit optimal waste outcomes in Sydney. The New South Wales Government has seen it appropriate to manage other issues on a metro basis, highlighted by the metro waste plan, regulation in the electricity distribution networks and the establishment of the Greater Sydney Commission to guide land use planning.

We believe that waste management is best planned for on a metro basis. While preparing the plan the following activities should be undertaken. First, a thorough review of existing and future waste treatment needs and capacity. Such a study was understood to be commissioned by the New South Wales EPA around 2015 and the city encourages the New South Wales Government to publicly release the findings. Studies undertaken by the city in developing its advanced waste treatment master plan suggest that Sydney metro is falling well short of its current and planned non-landfill management facilities if it is to meet the demands of a growing city. Secondly, improved data gathering and reporting methodologies that focus on understanding the generation rates and location for recycling and residual waste and the final re-use and disposal locations is required.

This should be complemented by improved reporting and audit protocols to ensure the community trust needed to drive recycling behaviours and appropriate evidence-based decision making can be made by business and government to best manage waste across Sydney. Thirdly, identifying suitable areas for waste management, for example transfer stations and treatment facilities, and protect these from residential development and other sensitive land uses; facilitate increased collaboration between the Department of Planning and the EPA and consider the designation of waste and recycling services and their corresponding infrastructure needs as essential services under the New South Wales Government Essential Services Act and/or consider the development of an infrastructure State environment planning policy. Doing so would allow appropriate land reservation and zoning for optimal waste management in Sydney.

Fourthly, nominate a single lead organisation as responsible for the development and delivery of the Sydney metro waste plan with support from other agencies and stakeholders. To complement the development of the waste management plan for Sydney there needs to be a trusted source of information on energy from waste technologies. Research undertaken by Southern Sydney Region of Councils [SSROC] suggests that the New South Wales EPA is trusted by the community as the most credible source of information about energy from waste. The city would therefore like to see the New South Wales EPA having responsibility for raising awareness and providing independently verified information regarding the environmental and health impacts of energy from waste to address community concerns.

The city is aware of a range of technologies currently operating or at the early commercialisation and development stage but does not have a view on the preferred technology. We would like to see the EPA undertake some rigorous research into the range of energy from waste technologies, publish the results and lead community engagement with the support of stakeholders such as councils. The current Regional Clean Energy Program is a good example of how the New South Wales Government can lead community engagement and provide the community with factual information on new energy technologies. Global best practice case studies that the city is aware of suggest that when a State agency or equivalent with a broad engagement campaign, the ability to build the required social licence to operate is much greater than if one company or one council proceeds alone.

Finally, the city's own draft Leave Nothing to Waste strategy is currently on exhibition. The strategy acknowledges that to achieve future waste goals on an integrated solution of behaviour change, council and industry collection techniques, logistics and the availability of re-use markets and disposal technologies is needed. It is only when all practical and appropriate management actions and technologies are applied upstream to re-use or recycle materials and that there is still a residual waste stream should energy from waste be considered and energy from waste should be considered in preference to landfill. The city supports waste to energy as part of an integrated solution. Residual waste is still a big part of the waste stream despite many recycling services in Sydney.

For these reasons outlined in this opening statement and our written submission the city welcomes this inquiry and hopes that findings will be used in good faith to facilitate best practice waste management and economic opportunities for New South Wales.

The CHAIR: Thank you very much for a good local government submission.

The Hon. JOHN GRAHAM: With regard to waste data, the Committee has already heard evidence that we could do this better, there could be better data released and made available earlier. Can you tell us what practical problems this provides for an organisation like the city relying on data in the public realm, which is out of date and could be more comprehensive? What does that actually mean for the city?

Mr DERKSEMA: I will start with maybe one example and Ms Dawson might want to provide another. In order to develop our strategy we had to understand the commercial and industrial generation levels within the City of Sydney. The data that was available from the EPA on the generation rates from different commercial operations was quite out of date and not as granular as we would have liked. We had to commission or own study to look at what was the local generation rates from different types of businesses within the City of Sydney.

We are very lucky in the city that we then have a floor space employment census that tells us the different business types per square metre across the whole city. We can multiply the generation rates by the land use types to then determine how much waste is generated in Sydney. In doing that, we now understand that residential waste makes up only 10 per cent of the waste stream in the City of Sydney due to the high level of business. We would not have been able do that unless we had gone out and commissioned our own study.

Ms DAWSON: I would like to add to that that all of those estimates are estimates, so even though we commissioned a piece of work, all we have been able to do is extrapolate data and come up with estimates. What we would really like to be able to do is get hold of real data. One of the big problems that we have had in recent years is that, currently, the only actual accurate weight-based data we have available is the amount of tonnes that goes to landfill. So the amount of waste or materials that go through resource recovery facilities is not made available, and we have no way of asking businesses for that information.

Another point is that in almost all cases, or certainly in the City of Sydney, certainly almost all of the waste that is produced in our local government area is transported out of the local government area for processing and treatment or disposal. There are no processing facilitates in the City of Sydney and, therefore, once that material gets picked up from outside our businesses, we do not have any control of being able to find out—

The Hon. LOU AMATO: You cannot track it?

Ms DAWSON: We cannot track it. There is no tracking. Currently in New South Wales there is only tracking of waste on hazardous waste materials. I think the New South Wales EPA are starting to get returns from recycling and reprocessing facilities on the amount of tonnes that they are managing, but we do not have access to that data.

The Hon. JOHN GRAHAM: They are helpful observations. Were the Committee to recommend that we sought better data and that the data we have is released early, you would be for supportive of those recommendations?

Mr DERKSEMA: Absolutely. I think even closer to home for us is that the protocols around the reporting from local governments could also be made more consistent through clearer standards for each local government.

The Hon. JOHN GRAHAM: Secondly, on the issue of a strategy, you made the point clearly in your submission today and in your written submission about the need for a strategy across the board. I thought that was a point well made. I wanted to ask about the waste treatment and capacity study you referred to commissioned by the EPA in 2015, but yet to be made publicly available. Is your understanding that report has been completed, but not released?

Ms DAWSON: I think it was circa 2015, because I have never seen it. My understanding is that there was a report commissioned in 2015. I think the results were not satisfactory, potentially, and therefore they have gone out to do more work on that study. It is now 2017 and we still have not seen—the capacity data that we have available is generally by consultants actually going out and estimating the treatment capacity of facilities, because they are not obliged to report them.

The Hon. JOHN GRAHAM: Understood. Again, you would support a call for that to be released?

Ms DAWSON: Yes.

Mr DERKSEMA: Absolutely.

The Hon. JOHN GRAHAM: Thirdly, I want to ask about your recommendation to identify single-lead organisations responsible for capacity with then support from other agencies. I was less persuaded on this point. I am interested to hear do we really need to reorganise government to deal with this? You have made a clear case for strategy to look at this issue. What is the problem we are trying to fix by rearranging the government agencies or whoever is in charge?

Mr DERKSEMA: The first step is not necessarily about rearranging government agencies. It is about getting a clearer picture of what is going on in the major waste generation centre for New South Wales, which is the Sydney metro area. Looking at the water sector is not a bad way to start. There is a metro water plan, and while Sydney Water provide the majority of services and obviously would have a lot of understanding and the data, there is an independent agency that says this is the kind of future that is needed in Sydney that takes into consideration of the growing population, the needs of the community, looks at the different technologies that are available, looks at best practice around the world and starts to provide a little more framework to guiding the best solutions from a societal point of view for Sydney.

The Hon. JOHN GRAHAM: Where would you put that function in the existing Government? Who would lead?

Mr DERKSEMA: I suppose we do not have a formal position on that, but the EPA would be seen to be the starting agency, at least, or it could be a consortia of agencies between the Department of the Environment and Energy as well as EPA to start with.

Ms DAWSON: The situation at the moment is that the New South Wales EPA is responsible for delivering the State strategy, putting the targets. They have the money to award to businesses or to councils to improve recycling and that could be development of infrastructure or different collection processes, and that is great, so the money is part of the problem. But there is another big problem, which is planning, getting planning approval, development approvals for waste treatment facilities in metro Sydney. When we speak to the EPA and its concerns about getting these facilities up and running, even though the money is available, operators cannot find a site and get approval because there is a lot of opposition to waste development, plus, there is a lot of encroachment. The value of land is so high, particularly in the City of Sydney at the moment, that to have a piece of land developed purely for waste, the economics do not stack up. You find that waste is going further and further out.

Mr DERKSEMA: Can I add one point to that as well. There has been a legacy issue here. We feel that the EPA's role as a regulator may, at times, inhibit its ability to be an educator and there is a perceived conflict of interest around that. We are seeing that the Department of the Environment and Energy having roles for energy and water in terms of education and programs, so maybe there is potential for them to take on waste programs as well.

Mr JEREMY BUCKINGHAM: The impression I get from your submission and your evidence this morning so far is that the city is flying blind a little bit in terms of the generation of waste and where it is going. I am particularly interested in the fact that you felt the need to generate your own study. Is that a publicly available study?

Ms DAWSON: Yes.

Mr JEREMY BUCKINGHAM: Could I ask that you provide a copy of that for the benefit of the Committee in its deliberations?

Mr DERKSEMA: Absolutely.

Mr JEREMY BUCKINGHAM: I think that is going to be really interesting information. If I am correct, Mr Derksema, you said that in that study only 10 per cent of the waste stream that was identified was household waste, so 90 per cent of the waste stream—I assume that is by weight—is coming from commercial or construction and demolition.

Mr DERKSEMA: Just commercial and industrial, yes.

Mr JEREMY BUCKINGHAM: So you do not do any assessment of the construction and demolition waste coming from the City of Sydney?

Mr DERKSEMA: We did that as well. I can get you the numbers. I do not have them to hand, but we also have that figure as well, which I think is even larger again than the commercial and industrial volumes.

Mr JEREMY BUCKINGHAM: So the most significant waste stream coming out of the City of Sydney—and it makes sense—is demolishing Westpac, IMAX and the rest of it. What role do you have as the City of Sydney in approving a development application [DA] to demolish a building and the rest in assessing what the proponent for a demolition and potentially construction and so on is doing with that waste stream? I am particularly interested in the construction and demolition.

Ms DAWSON: All DAs have to be accompanied by a waste management plan. The problem that we have is that we cannot go out and verify every single waste management plan for development in the city. We just do not have the resources to do that. We are taking steps internally to try to address that, but we cannot go out. All we can do is ask which commercial operator they have on board to do their separation and recycling. We ask them for a target, but we cannot go out. A lot of the time that material leaves our local government area or leaves the State. We have no control over that.

Mr JEREMY BUCKINGHAM: You have no control over that. It is just proponent-driven and you are going on the basis of the waste management plan and the facts that are put before the council.

Mr DERKSEMA: Yes. I should also say there is certification of that and many of the buildings have private certification because that is the system that we have in New South Wales. A proponent for a DA can have their own private certifier, so while council condition a development application, they might have a private certifier to go and check and give the occupation certificates and construction certificates and those types of things. That third party arrangement also means that we have a lesser role than we would probably like in terms of ensuring conditions are met on construction sites.

Mr JEREMY BUCKINGHAM: The Committee has heard from previous witnesses and submissions that the guiding principle is that there is a hierarchy in terms of the waste stream and that the objective there is to promote higher rates of prevention, re-use and recycling. A key factor in that is the greenhouse gas emissions and the like. I know the City of Sydney has been very interested in previous times in cogeneration and those types of issues. What is your view on landfill as opposed to energy from waste? Has the city done any assessment of which one of those actually produces fewer greenhouse gas emissions?

Ms DAWSON: I was not actually responsible for the study, but the master plan did do quite a lot of work into the CO2—like a lifecycle assessment on the three different technologies that we looked at against landfill. I believe that study showed that energy from waste facilities had a greater benefit of CO2 reduction than landfill. I would also like to make a point that not all landfill gas capture facilities are as efficient as perhaps sometimes reported. I think sometimes that 50 per cent is potentially not conservative enough.

The Hon. LOU AMATO: Are you talking about methane gas capture?

Mr DERKSEMA: Can I just add to that? In relation to the residential waste, it is the waste that we are responsible for. We have undertaken particular studies to look at the greenhouse gas impact of taking organics out of the stream. We have a high percentage of apartment dwellers in the City of Sydney—about 75 per cent plus. That is unique compared to many other councils. We have been looking at how to take out the organic

stream, because it is about 35 per cent or so of our red bin waste. In doing so, what we started to understand was that from a greenhouse gas perspective we would have to capture almost 80 per cent of the organic waste in the red bin before we started getting a better greenhouse outcome than through the current practices, which is sending our red bin waste to a facility where the organic fraction is composted and turned into a cover on mine sites.

It is a low-grade compost. It cannot be used for food production or anything like that. It goes to mine sites. That is where we send our current red bin waste. Eighty per cent is a very high figure for any program. If we were to try to achieve that in the City of Sydney, I think we would fall short.

Mr JEREMY BUCKINGHAM: Interesting.

The CHAIR: Are there any questions from Government members?

The Hon. SHAYNE MALLARD: I should declare I was a councillor for 12 years with the City of Sydney, so I was very involved with all their waste management and I know Mr Derksema quite well. How do you handle residential waste? Your red bins do not just go off to landfill; they are sent out to Eastern Creek. Go through that process for us.

Ms DAWSON: I will start by saying we have a number of recycling services. We have the yellow bin, which takes all of the container recycling—glass, plastics, metals and paper. We currently achieve 28 per cent recycling from that source segregation. All the remainder that goes into the red bin goes to a mechanical biological treatment facility, which Mr Derksema just referred to.

The Hon. SHAYNE MALLARD: At Eastern Creek.

Ms DAWSON: At Eastern Creek. There the waste goes in as it comes out of the red bin. It gets separated in a mechanical treatment facility where they try to separate out as much of the organic fraction from whatever is left—plastics, textiles, paper and anything that has not been separated by the resident and all the non-recyclables. All of that material, which is approximately 45 per cent to 50 per cent, then goes straight to landfill. It has no other use; it is all quite heavily contaminated. And then the organic fraction is composted and, as Mr Derksema mentioned, is used for either landfill cover or mine rehabilitation. So, even though we are sending to a processing facility, we are only really getting about 50 per cent of that material classed as recovered or recycled in New South Wales. The remaining 50 per cent goes straight to landfill and there is no current use for that material.

The Hon. SHAYNE MALLARD: Other councils' red bins just go straight to landfill though.

Ms DAWSON: Some other councils.

The Hon. SHAYNE MALLARD: They do not have that investment which City of Sydney has with that facility.

Ms DAWSON: Yes, but a lot do and a lot have contracts for that type of treatment. But again it can only really deal with approximately 50 per cent of what is in that bin.

The Hon. SHAYNE MALLARD: I was pleasantly surprised to hear Mr Derksema talk about the fact that to achieve zero waste you accept energy from waste technology as part of the solution. That would have been a good debate at the council, because it is quite a controversial position. Could you outline the council position on that and how the council achieved it?

Mr DERKSEMA: We currently have a draft Leave Nothing to Waste waste strategy, which is on public exhibition at the moment. We are receiving comments back from stakeholders and the general public.

The Hon. SHAYNE MALLARD: Could you give us a copy of that?

Mr DERKSEMA: Yes, absolutely. While you ask it, I think there is a little bit of confusion. There are two studies we undertook. One was the Advanced Waste Treatment Master Plan, that is definitely out and can be obtained from our website and we can send it through. There is another study we undertook looking at the generation rates from different land use types within the City of Sydney, and we can provide that as well. There are probably three documents there to provide.

Mr JEREMY BUCKINGHAM: Thank you.

Mr DERKSEMA: In terms of that conversation, we are a member of the C40 Cities, which is a network of cities globally all committed to significant action on climate change. Through that network we get quite a good understanding of leading practice from other cities around the world in relation to all issues that impact on climate change, one of them being waste management. What we are starting to see is many cities, in

the leading bunch at least, committing to zero waste outcomes, which is kind of recognised as being at least 90 per cent diversion from landfill. At the moment we are at 69 per cent with current activities. If we continue to undertake further education with our residents and engagement with our residents and push the service levels that we have at the moment with the contracts that we have, we feel we can achieve at the maximum 79 per cent. That is why there is a gap between that 79 per cent and the 90 per cent. We see at the moment in Sydney that the only way we can fill that gap is through an energy from waste facility.

Of course we are not experts in high-end waste treatment technology. We see that as the industry's role. All we can do is try to create an environment where we signal to the industry that we need these types of outcomes in order to achieve a net zero waste outcome. That is what we have been trying to do through engaging with industry and the development of a master plan as well. Our master plan did suggest more so that gasification was a preferred technology for the city rather than others. However, we appreciate that that is not necessarily the cheapest option as well. There are many factors that go into that kind of outcome. Again, we would then be looking for industry to provide the real understanding of the best technology to help us to achieve our targets.

The Hon. SHAYNE MALLARD: How are you going to get buy-in on the 2,000 tonnes a day that is going into landfill, which is largely commercial? How does the council get buy-in on that? That is a big issue.

Mr DERKSEMA: It is. We provide a whole series of programs with industry, stakeholders and business. I would just give you one example which might highlight the kinds of actions we take in the waste sector. One of them is the Better Buildings Partnership. That is a relationship with 14 property owners in the city who own about 50 per cent of the building space within the central business district. We work with them to develop some guidelines for the management of waste in their facilities and in their buildings. They have committed also to embedding these in their procurement contracts so they are driving better outcomes up the waste service supply chain to then achieve their carbon reduction goals and their waste reduction goals as well as organisation. We provide the resource to them. We work with them and use their understanding and their leadership positions as well as the corporate knowledge and understanding to then co-develop and co-author some of those types of documents.

We also undertake studies with them. We undertook a study looking at the de-fit waste from when office tenants move out of buildings and new tenants move in. We estimated that to be in the order of 70,000 tonnes a year, which is quite a big stream and is in the same order of magnitude as residential waste generated within the City of Sydney. We have developed guidelines for businesses that want to de-fit or change over their office space, which happens quite regularly, obviously, in Sydney. The next part of that will be working with them. One of the barriers to making that work is that office changeovers happen very quickly. We need a space to store those materials before they can be re-used or resold to someone else for use. We may consider working with them to provide a space for those kinds of materials into the future to facilitate that kind of an outcome. That just gives you a bit of an example. We do it through partnership, education, grants and undertaking studies together with industry.

The CHAIR: Unfortunately, that is all we have time for. As has been said, your submission has been really helpful. I notice that you have taken a couple of questions on notice. The secretariat will help you with those things and, given your evidence, we might put additional questions to you. Thank you very much for your time this morning.

(The witnesses withdrew)

MARK ROEBUCK, Manager, City Works and Services, Wollongong City Council, sworn and examined

MARK WOOD, Group Manager, Engineering Operations, Sutherland Shire Council, sworn and examined

NAMOI DOUGALL, General Manager, Southern Sydney Regional Organisation of Councils, sworn and examined

HAZEL STOREY, Strategic Coordinator, Resource Recovery and Waste, Southern Sydney Regional Organisation of Councils, affirmed and examined

The CHAIR: Would anyone like to present an opening statement?

Mr WOOD: I thank the Committee for inviting the Sutherland Shire Council to participate in today's session and for the opportunity to provide some context around waste management in southern Sydney. The Sutherland Shire Council is one of the largest local government areas by population in New South Wales with some 226,000 residents. Each year the council collects and disposes of more than 50,000 tonnes of residential waste and 24,000 tonnes of recycling. This waste is disposed of at the Lucas Heights waste management facility and the Visy materials recovery facility at Taren Point by way of direct haulage. There are no domestic waste transfer stations in the Sutherland shire.

The Lucas Heights facility is a putrescible landfill and garden organic waste management facility. In February this year the New South Wales Department of Planning approved an extension of the landfilling operation to 2035 and increased the annual quantity of waste to 850,000 tonnes. Sutherland council is a partner to the planning agreement. The Lucas Heights landfill facility was the only putrescible landfill in the Sydney metropolitan basin from the end of this month when Eastern Creek closes. This will result in all the putrescible waste currently contracted to SUEZ being transported to Lucas Heights. What this actually means is that the waste from the SUEZ transfer stations from Rockdale, which is east of Sydney, Artarmon, which is in the north of Sydney, Eastern Creek, which is in the west of Sydney, and Spring Farm, which is in south-west Sydney, will all be transported across Sydney through the Sutherland shire to Lucas Heights.

It is estimated this will require between 68,000 to 85,000 truck movements per annum. Currently Sydney councils have only two options for the disposal of the municipal waste: SUEZ, which will transport the waste via the transfer station network at Lucas Heights, or Veolia, that will transport the waste by rail to Woodlawn via their Clyde or Banksmeadow. The implementation of energy waste in new South Wales will help stimulate competition in the market by providing alternative waste disposal and treatment options. If the implementation of energy from waste follows a similar model to that observed in Europe and Japan, it is likely that local medium-scale energy from waste will be viable at a local scale and will be able to provide direct competition to the landfills, while also simplifying the logistics of transporting waste through our congested road networks.

Sutherland Shire Council would also support something similar to a proximity principle, which is written into the European Commission's waste framework directive, and which has been a central value in the municipal solid waste management in Japan for more than 35 years. The unnecessary transport of waste undermines any potential in resource recovery infrastructure if these costs are not fully accounted for. We are also please that Mr Beaman, from the EPA, indicated that it is finalising the first ever New South Wales waste and resource recovery infrastructure strategy for consultation. There has been a void in developing a integrated infrastructure plan for waste facilities across Sydney for many years, and we look forward to working with the New South Wales EPA.

Ms DOUGALL: Thank you for inviting the Southern Sydney Regional Organisation of Councils [SSROC] to appear before you today. I have with me our Strategic Waste Coordinator, Hazel Storey. As you may be aware, SSROC is an association of 11 councils, south of Sydney, and covers one-third of the Sydney region and 1.7 million people. It provides a forum for exchanging ideas and undertakes regional projects that contribute to the sustainability of member councils and communities. SSROC advocates and provides contracts and procurement to provide savings to our member councils.

SSROC welcomes the New South Wales Government's Waste Less, Recycle More package, particularly the funding that allows us to work with councils at scale to provide innovative solutions which meet community needs, add economic value and which have a social licence. Energy from waste does not yet have a social licence here in Sydney, and this needs to be fixed. SSROC has started to do this through the social research it conducted in 2015 on attitudes to energy from waste technology. We would like to reiterate what many previous speakers have said, which is that if a greater percentage of the waste levy were refunded to councils, we could do more on all levels of the waste hierarchy. Looking more broadly, waste management is

fundamentally about public health, and we again echo what the City of Sydney said about it being classified as an essential service. It is so important that we cannot takes risks with it.

While waiting for the waste infrastructure plan for New South Wales, and with no district level modelling on waste at a district plan scale available, SSROC commissioned its own survey. It showed that by 2036 our residents will be producing between 30 per cent to 50 per cent more red bin waste than they did in 2016. That is the equivalent of another two Woodlawns, which is the Veolia plant built for some of the member councils. Another two of those plants will be needed by 2036, and that is just for the SSROC area. It must be remembered that SSROC's Woodlawn project took more than eight years from the start to July this year to become operational, and as soon as it opened it was already at capacity. If we add the projected tonnage for the Western Sydney Regional Organisation of Councils [WSROC] and the Macarthur Regional Organisation of Councils [MACROC] areas, about another four plants the size of Woodlawn may be needed. These are significant infrastructure requirements that need the government to start strategically planning now.

We know infrastructure is a priority for New South Wales, and we are keen to emphasise the need for waste infrastructure. It is essential and government intervention is needed to ensure that appropriate land is secured for it. We risk future public health issues if we do not plan now for adequate waste infrastructure for our growing population, especially in southern Sydney, which has some dramatic growth plans in areas such as the Sydenham to Bankstown corridor, Central to Eveleigh, and Banksia to Arncliffe. Governments also need to manage the risk of land not being available. I do not mean land for landfill; I mean resource recovery facilities, including energy recovery. With the forecasts indicating that there will be large volumes of waste, we need to be looking at energy from waste facilities as an option. If we do look at this form of energy recovery then we need to start small to demonstrate that an energy from waste facility can make a clean and a positive contribution to an energy supply. But before we start we need to gain that social licence.

Waste infrastructure is a good thing, not only to provide the essential services, such as Woodlawn. Everyone at SSROC is very excited that after eight years the Veolia contract is up and running and is delivery investment in regional New South Wales. The contract takes trucks off the road, reduces congestion and transport emissions, has provided a new transfer station and a new processing facility, and has created about 50 jobs in southern Sydney and regional New South Wales. Of course, it also diverts waste from the landfill and increases resource recovery rate in New South Wales. It is water neutral, it produces compost, it recovers metals, and waste heat is used in aqua culture. It is a smart solution and a great achievement.

I would now like to turn to future infrastructure. To free councils and industry to focus on innovation and to plan for smarter solutions, we would like to see the EPA Waste Infrastructure Grants allow for the acquisition of land and for the grants to run for more than three years or to be deliverable in phases. This would recognise that infrastructure takes more than three years and to get approved and built. We would like to see the allocation of more waste levy funds back to councils. The role of government is very important for us in being able to commission smart solutions. Making waste infrastructure essential State significant infrastructure, and securing land for it, is key across the Sydney Basin.

This is the responsibility of State Government and the Greater Sydney Commission. Industry experts can provide innovative district and regional scale solutions, networks of transfer stations, and re-use centres to divert items that are still useful, and industry can provide the recycling plants and even the energy to recovery plants. However, it is government that provides strategic planning, including planning for co-location to grow the circular economy. During the next four years, as well as the efficient processing of red bin waste, our councils want us to pursue waste avoidance and re-use initiatives to support the circular economy. We are excited to deliver this New South Wales Government objective.

In concluding our introduction, the key points we would like the Committee to hear are, firstly, that suitable land zoned or rezoned by the State Government or by direction from the Greater Sydney Commission with appropriate buffers and must be retained for essential State significant waste services to ensure the social and economic viability of Sydney. Secondly, councils should receive a greater share of the waste levy funds, directly or via their regional organisations. SSROC member councils absolutely support New South Wales Government policy drivers behind the energy from waste policy, the waste levy, and the Waste Less, Recycle More package. SSROC is therefore keen to help the Government in any way that it can with progressing the findings from this valuable and timely inquiry. Thank you.

The CHAIR: Thank you. Mr Roebuck, can you run the Committee through the second paragraph in part A of the Wollongong City Council submission with reference to the section 88 waste levy and what you pay?

Mr ROEBUCK: Thank you for the question. We run our own landfill site in Whytes Gully in Wollongong. We process approximately 80,000 tonnes per annum. It is roughly 50/50 commercial and domestic

waste. Last financial year we contributed $15 million in waste levies to the EPA. We realise that there was a further reduction in the review of the better waste and recycling program. We received approximately 3 per cent back, which is about $430,000. Holistically, our view is similar to that of other councils represented here; that is, we believe that if more of that money came back to councils we could do more.

The Hon. SHAYNE MALLARD: What would you do?

Mr ROEBUCK: We are in the preliminary stage of preparing a brief to go to market to look for alternative waste treatment technologies and/or energy from waste. This has been on our books for some time. We were under a proposed merging cloud, which put a hold on our planning in that space. However, that said, we believe that if there were more available funding in that space we could speed up those processes. But that said, we believe that if there was more available funding in that space we could speed up that process. Our resourcing at the moment is running a waste facility. The other area I manage is the waste collection side of the business.

The Hon. MATTHEW MASON-COX: Do you think an energy from waste facility is a natural extension of your recycling initiatives?

Mr ROEBUCK: We believe it is part of a broader package to divert waste from landfill. We are open to all options. We want to look at the best technology, and we do not know where that is going to come from. That is why we believe in a fairly open expression of interest process. We have room at our site to do alternative waste technologies. We had a plant back in the day, which I am not really familiar with because it was before my time, the solid waste energy recovery facility [SWERF]. We want to look to divert more from landfill to extend the life of the landfill. At the moment, we are projecting a lifespan up to 2065, and that has a fairly conservative 10-year buffer for alternative waste transfer technologies. We want to increase that buffer. If something becomes available to stop more waste going to landfill, we can then maintain that site for a lot longer.

The CHAIR: What is the cost of the proposal you were working on?

Mr ROEBUCK: In value?

The CHAIR: Yes.

Mr ROEBUCK: I would have to take that on notice.

The CHAIR: Is it millions?

Mr ROEBUCK: Potentially it would be millions over a long period of time. It needs to be a big investment.

The CHAIR: If the council would have to invest millions, you have just handed over $15 million a year, $1 million a month, to the State Government, of which you will get 3 per cent back and the local ratepayer will not only have paid all that but also will have to pay again to get a proposal that deals with your future waste. Would you call that double-dipping?

Mr ROEBUCK: I probably would not use the term "double-dipping", but I do see that there is an inequity—

The CHAIR: An injustice?

Mr ROEBUCK: —in the return.

The CHAIR: Would you see a hypothecation of at least a large proportion of that being fairer for you to achieve your waste disposal needs for the twenty-first century?

Mr ROEBUCK: We believe if there was more money available we would be able to do a lot more at that site.

The CHAIR: And you could keep a lot more out of landfill?

Mr ROEBUCK: Yes.

The Hon. JOHN GRAHAM: Mr Wood, you say that the Sutherland shire takes landfill from across metropolitan Sydney and that leads to many truck movements. That is not equitable, is it?

Mr WOOD: To the future, you are probably right. I guess where Sutherland is coming from is that is why we talked about the proximity principle of people managing the waste in their own backyard. The way it is going at the moment, is that Sutherland has the only landfill site in Sydney.

The Hon. JOHN GRAHAM: Are you hopeful that there may be some way of dealing down the track with the situation you have described as an inequity?

Mr WOOD: Yes, from Sutherland's perspective we have a waste treatment facility in our local government area. We would like it to be a sustainable operation leading on for future generations. The way it is currently set up is that it will last until 2035, and then we will be looking for something else.

The Hon. JOHN GRAHAM: Please tell us more about those truck movements.

Mr WOOD: It is estimated that 850,000 tonnes of material come into the facility per annum from different parts of Sydney. The trucks range from 10 tonne up to 25 tonne.

The CHAIR: What damage does that do to your local roads?

Mr WOOD: We are quite fortunate that they are probably on State roads. The real issue is the traffic movements. Obviously, in the Sydney morning peak, those trucks are coming from Artarmon, Rockdale, Eastern Creek, so people notice them.

The Hon. JOHN GRAHAM: What year are the estimates you are giving us?

Mr WOOD: They are starting at the end of this month. There are a lot of them on the road, particularly from Eastern Creek and Artarmon. The transfer stations that used to tip at Eastern Creek will be seen on our roads.

The Hon. JOHN GRAHAM: You said that you are grateful that there is a plan, but really the situation is a result of there being no plan or strategy across the Sydney metropolitan area?

Mr WOOD: An infrastructure waste strategy for Sydney has been missing for quite a while.

The Hon. JOHN GRAHAM: The situation you are describing really underlines how urgent this strategy is, does it not?

Mr ROEBUCK: You are right. We are probably talking another five to 10 years to have a strategy and then develop a plan to have any infrastructure.

The Hon. JOHN GRAHAM: We have to get going urgently for people being impacted by truck movements now.

Mr WOOD: I agree with that.

The Hon. JOHN GRAHAM: A view we have heard is for small-scale, local and proximate energy from waste facilities. Without commenting on a particular facility but in principle, I take it you would be less supportive of large-scale energy from waste proposals that would involve mass truck movements across Sydney.

Mr WOOD: Just based on transport logistics, it makes sense to have smaller facilities.

The Hon. JOHN GRAHAM: I turn to the Southern Sydney Regional Organisation of Councils research on community attitudes, which I found really helpful. A couple of the principles, conclusions and recommendations from your report included things like the importance of this information being put to the community from independent sources.

Ms STOREY: Yes, that is right.

The Hon. JOHN GRAHAM: That came through very clearly and underlined how important it was that communications be initiated early to provide genuine, active community involvement. Please elaborate on the research for those findings.

Ms STOREY: Thank you for the lead-in to your question. I would like to emphasise that this study was about talking about the good neighbour principle, with the policy coming out. We looked at what the good neighbour principle is and how to unpack it. It is different from community engagement being done about a specific application for a facility. It is almost like pre-research, and that means we were looking at the values that would underpin getting a social licence. I have made some notes on the key findings, if you would like me to cover. Is that where you would like me to go?

The Hon. JOHN GRAHAM: Yes, just briefly anything you would like to say about the research.

Ms STOREY: The research, firstly, reinforces the energy from waste policy and the EPA's position. Secondly, it supports a lot of the dialogue that has gone on through the inquiry. We were surprised to find that how the waste would be treated in the facility was more important than where. You would anticipate lots of "not in my backyard", but that was not anywhere as strong as we expected. The “how” came to environmental health

and public health, which I know have been covered a lot. Important factors around the development were about stringent environmental and health regulations, efficient and effective operations and addressing residents' concerns. There is something about the trust issue here, and we asked who would be the trusted bodies. It came down to a scientist, CSIRO being mentioned and the EPA being another body that was mentioned as a trusted source of information.

The Hon. JOHN GRAHAM: That is fundamental to what I took out of this, that people are not closed to these sorts of facilities—

Ms STOREY: Absolutely not, nor the technology.

The Hon. JOHN GRAHAM: —but that trust is fundamental to the social licence.

Ms STOREY: They were also interested in exploring new opportunities and new technologies. Interestingly, the research has reinforced other bits of social research. We have done a few pieces of social research over the last few years. In our region there is a move away from the palatability of landfilling waste for residents; they see it as a waste of resources. So it comes back to fundamentals. Without being too dramatic, our residents almost want to live within the waste hierarchy; they want us all to be lifting up the hierarchy.

The Hon. JOHN GRAHAM: We have looked at one very large proposal in Western Sydney, but I do not want you to comment on that. If a very large proposal like that attracts a lot of attention and does not meet the crust threshold you are describing, presumably that makes it a lot harder to develop the sorts of proposals you might want to talk about with your local community that do meet these?

Ms DOUGALL: Absolutely. Again, like everybody, we think that sort of smaller, more efficient sites would be far more palatable. But this is pre-research, and we would like is more money back to help us to do even more research on this because energy from waste is definitely something we would like to do as a group of councils. We have got one council that already has land, but on a much smaller scale. All of Sydney feels like it knows about particulate matter but, of course, that is not necessarily what we are talking about. There is a longer and slower education process that needs to be undertaken. This is not going to happen overnight because that trust needs to be built up first.

The CHAIR: If there were an energy from waste facility in Sydney, given the planning issues, development application issues and lead-in issues, would your councils be part of the feedstock for that, or would it be too expensive?

Ms DOUGALL: I think there is some agreement, but it would not be every council.

Ms STOREY: Our councils come from a position that if it meets the policy and it meets the State Government requirements as the legislative body with the control then provided the price is right, et cetera.

The Hon. SHAYNE MALLARD: This would be red bin waste?

Ms STOREY: It is red bin waste we are talking about.

Mr WOOD: Sorry, I seem to be harping a bit on the transport scheme. If we have got a facility in our local government area [LGA], if someone came with an initiative for a waste plant in Western Sydney, we would not be taking our waste over there.

The CHAIR: No, that is obvious, and I think that goes with the section 88 waste levy issue of hypothecation. You could all do something together.

Mr WOOD: Even though it might give us 90 per cent diversion, we would say no.

Mr JEREMY BUCKINGHAM: I thank the councils and the Regional Organisation of Councils for excellent submissions. They are very informative and that demonstrates again the importance of local government in our State. The theme I picked up from your submissions was that there is a lack of options, diversity and competition in the marketplace. Is that how you would characterise the current situation?

Ms STOREY: Yes.

Mr WOOD: Yes.

Mr JEREMY BUCKINGHAM: The Sutherland Shire Council talks about the SUEZ facility. It was a government-owned facility but it then went into private ownership. When did that occur?

Mr WOOD: It used to be Metropolitan Landfill and it became WSN. I think it was sold in mid-2000, to SITA, maybe late 2000.

Ms STOREY: I am not 100 per cent sure on that one.

Mr JEREMY BUCKINGHAM: But you have no other option than to use that particular facility?

Mr WOOD: For us that is our nearest location, yes.

Mr JEREMY BUCKINGHAM: Effectively you are a price taker in that situation, you have no choice, and there is no other competition in the market.

Mr WOOD: There is no other competition but, as I mentioned, Sutherland Shire Council is a partner in the planning agreement, so we have an arrangement for disposal of our waste there.

Mr JEREMY BUCKINGHAM: In terms of the recyclables, again you really have no choice but to go with Visy and the Tarren Point facility?

Mr WOOD: That is probably one of our concerns for future-proofing our collection. If the Visy facility were to close down for any reason, we would have to transport our recyclables to either Rydalmere or Smithfield.

Mr JEREMY BUCKINGHAM: There is no other option and that will cost the ratepayers a lot of money.

Mr WOOD: Another couple of trucks.

Mr JEREMY BUCKINGHAM: It seems to me from your submission that you are looking at using the levy to collectively provide some alternatives in the market place, and the ROC or councils individually are using their levy to provide alternative facilities and therefore other options to gain some competitive advantage.

Mr WOOD: If the levy provides us with the option of working with the ROC and other councils to build some infrastructure, we will look at that. But at the moment the levy does not allow us to do that.

Mr JEREMY BUCKINGHAM: When you say the levy does not allow you to do that, for the benefit of the Committee how does that manifest itself?

Mr WOOD: The way the grants are set up at the moment and the way it has been established for the better waste recycling we cannot buy land for large infrastructure; it is more smaller, piecemeal type activities.

Mr JEREMY BUCKINGHAM: You can do it for smaller things, but there seems to be a threshold for a larger facility?

Mr WOOD: That is right.

Mr JEREMY BUCKINGHAM: Is that is enshrined in an Act or elsewhere?

Mr WOOD: It is in the grant guidelines. A lot of councils have taken up the community recycling centres, those type of things, but that is about your threshold.

The CHAIR: The other important thing to point out is that if local councils, particularly regional and rural councils, could do this they could also provide employment for many people in their local communities. It can value-add.

The Hon. SHAYNE MALLARD: Thank you for your submissions. Grappling with the issue of infrastructure—which you have all addressed well—and leadership from the State, the Greater Sydney Planning Commission perhaps, and the master plan direction for the future of waste management in our metropolitan area, would you like to see localised or group council approaches to waste, rather than one mega waste location, being Lucas Heights or Western Sydney? Would you like to see local communities take responsibility for their waste to a point? I refer to your recycling centre, with an energy from waste outcome at the end for that final piece of waste that cannot be recycled. Would you see that in the sense of a ROC-type approach?

Ms STOREY: The member councils have certainly talked about that approach. It is borne out in the social research that residents are moving more towards the idea that if we produce it in our area we ought to deal with it in our area. There is a movement more down that track. It is not everybody by any means. As Mr Roebuck says, the practicality of the logistics is that the trucks on the road means fewer service collections means it takes longer for bins to be collected. It all comes back to what happen at the kerbside.

The Hon. SHAYNE MALLARD: We hear about it and you have referred to this concept of social licence. When the Committee was at Blacktown we got the sense there was anger about the lack of social licence for a mega proposal, without going into the details. Decentralising the infrastructure to communities, using the tools you talked about with communicating—

Ms STOREY: Yes, I think that is fair enough and it takes time. Waste is not at the forefront of everybody's thinking on a day-to-day basis until they see what is happening down the road. With that in mind,

one of the things we have mentioned that we would love to see the EPA take the lead in some way, perhaps in partnership, in starting this dialogue within our communities. It is something I have spoken about with the policy people. Since we did this research, we have had a circular conversation around it: Is it the responsibility of the professional association; is it the responsibility of the EPA; or is it the responsibly of an individual council? It is everybody's responsibility, but we must have a comprehensive dialogue. In a way, this goes back to the city's presentation asking where and how we can work with one agency taking the lead, and supporting them in that journey in having common conversation.

Mr ROEBUCK: Wollongong is a little bit different from the southern metro area. To follow that chain of thought; we are working with the Illawarra Region of Councils and the Illawarra Pilot Joint Organisation [IPJO]. We work together on waste ideas and we come together monthly to discuss those things. Hearing Mr Wood talk about all these trucks makes me a little worried about our facility because it is not far away. That said, there are some synergies for us to be working on with our northern neighbours as well from a strategic perspective. Like you just said, waste is not at the front of everyone's mind, but I think these programs being broadcast on the television more and more are bringing this to the front of mind and potentially leading this type of discussion today. We need to work together because it is not going away.

Ms STOREY: I did mention Mr Craig Reucassel was at the City of Sydney strategy launch. We ended up having a conversation in the corridor about future thinking and future episodes and the series *War on Waste*. I think he is going to Woodlawn for a look. It would be wonderful if we could have some of that dialogue as part of the documentary series on what energy from waste might mean and where it would fit in for services applied to residents in New South Wales.

The CHAIR: I think some of the issues are that local governments are given all the accountability on waste disposal, use and landfill but no responsibility for funding. The funding goes to the State, the State holds the funding, the local council has to deal with it and then it has to produce. The submission from MRA Consulting Group mentions that there are 77 energy from waste [EFW] facilities in operation in America, 65 of which are private and 12 are public. If the State Government refuses to give local government money from the section 88 waste levy, it should at least be putting a network of EFWs throughout New South Wales so all those issues are dealt with and pay the final ticket. That is another solution.

The Hon. MATTHEW MASON-COX: In relation to proximity, you mentioned the experience overseas. Do you have a recommendation or view as to how proximity could work for energy from waste in New South Wales, perhaps a ROC model? Ideally you would want a landfill in each of those locations as well. Is that how you see it?

Mr WOOD: I have a personal view from my experience in the industry. Basically, if you are looking for a facility of about 200,000 tonnes, you want one in the north, one in the north-west, one in the west, one in the south-west and one in the south. As far as proximity is concerned, you are talking about 15 kilometres or 20 kilometres from the centre.

The Hon. MATTHEW MASON-COX: Ideally you would want landfill at each of those locations as well?

Mr WOOD: You could do, but not necessarily. The bottom ash that comes out of these facilities could be re-used in civil engineering products or it could go to another landfill facility.

The Hon. MATTHEW MASON-COX: How often is the EPA knocking on your door in relation to these issues?

Mr ROEBUCK: I would say quite often.

The CHAIR: Too often?

Mr ROEBUCK: Our landfill site does border on residential land, so we get a few complaints about smells, odours. We get a few knocks on the door in that respect, but we report to them monthly and do an annual report from a compliance perspective to comply with the licence. We have a good working relationship with them. Personally—this is not a council view—when I see the numbers lined up next to each other, yes, it is a little bit out of kilter. However, as I said earlier, that said, we work together really well. We understand that we have a joint problem and it is waste, and it is building up.

The CHAIR: It is hard to deliver all of the results with one arm tied behind your back. On that great note, I thank you for giving evidence. We appreciate your evidence because waste disposal issues are a different story when it is Sydney centric. You may have taken questions on notice, or in light of your evidence we may have questions on notice. The secretariat will help you with that. You have 21 days to answer. Thank you for your presentation today.

(The witnesses withdrew)

(Luncheon adjournment)

TONY FRASER, Manager Works and Services, Shoalhaven City Council, sworn and examined

DAVID HOJEM, Manager, Waste Services, Shoalhaven City Council, sworn and examined

The CHAIR: Good afternoon. As a declaration of interest, I was previously Mayor of the City of Shoalhaven from 2008 to 2012. Do you either of you have an opening statement?

Mr FRASER: Yes, I do. Good afternoon. The Shoalhaven is a coastal council occupying 4,660 square kilometres. The geographic size of the Shoalhaven local government area and spread of its population have many challenges for the provision of waste services. Its approximately 100,000 residents are spread across 49 towns and villages. Uniquely, council has 10 waste facilities across the LGA including one large putrescible landfill and one smaller inert waste landfill. In the previous financial year Shoalhaven paid almost $8 million in the Environment Protection Authority levy, of which only 4.2 per cent or $340,000 was returned in grants to support the continuous improvement of our waste operations. At $138.20 a tonne, the waste levy currently makes up 50 per cent of the Shoalhaven landfills' gate fee.

For the purpose of regulating the levy, the Shoalhaven is regarded as a metropolitan area, the same as Sydney, and pays the highest rate of that levy. In comparison, other local government areas which are closer to Sydney, such as the Blue Mountains and Wollondilly, are considered as regional councils and pay a lower rate. Our immediate southern neighbour, the Eurobodalla council, is outside the regulated area and pays no levy at all. However, ironically, the Shoalhaven's southern waste facilities and population are closer to the Eurobodalla's landfill than to our own. The socio-economic indicators clearly show the residents of the Shoalhaven do not have the capacity of the other council areas I have just mentioned. Revenue from our largest waste facility at West Nowra subsidises all other waste facilities, which run at a financial loss. There is no capacity to provide any fee relief without a change in the levy component or reduction in the service that we currently provide. The classification of the Shoalhaven as a metropolitan area needs review.

Energy from waste is not currently part of our waste strategy as it considers the throughput of waste that we currently have available, approximately 50,000 tonnes per annum, is not sufficient for this type of technology. Our current strategy is the implementation of processing technologies to process the contents of the red bin into usable products. This project is now in the procurement phase. When operational, our aim is to have 70 per cent of our waste diverted from landfill. We would encourage and support more levy payment being returned to the research and development into efficient and viable processing opportunities in regional areas. Thank you for the opportunity to participate in this inquiry.

The CHAIR: Thank you for your submission. Obviously I am very familiar with some of the issues, but it would be great to bring them to the attention of the inquiry. We will probably work through the impact on waste levies. I mentioned to previous witnesses the figure of $33 million and the fact that you are only getting 5.2 per cent and what you could do with that if you had it hypothecated. Can you walk us through some of the impacts of the waste levy, particularly No. 1 and No. 5 as listed in your submission?

Mr HOJEM: So No. 1 is the applicability and fairness—I assume that is what you are referring to.

The CHAIR: That is right.

Mr HOJEM: As Mr Fraser said, Eurobodalla, which is our immediate neighbour to the south, does not pay the levy. We as the Shoalhaven pay the full metropolitan levy. Places like the Blue Mountains and Wollondilly pay a regional levy, which I think is about $60 a tonne at the moment.

The CHAIR: How did they get that and the Shoalhaven got the metropolitan levy?

Mr HOJEM: It is historical. Ten years ago the Shoalhaven was on a lower levy than Sydney and the Blue Mountains did not pay at all, but our increases each year meant that about three years ago we came to parity with the metropolitan areas, so we pay the same amount. At about that time, they introduced a new levy paying area which included the Blue Mountains, Wollondilly and the coastal areas up north. They did not include inland or people south of us.

The CHAIR: How much are they paying per tonne?

Mr HOJEM: I would have to confirm that but it is about $60 a tonne.

The CHAIR: That is just under half.

The Hon. LOU AMATO: It is $79.60 going by your submission.

The CHAIR: I also want to ask you about item No. 5 about the impact of things. You talk about modification of the waste regulations that would improve recycling. Your submission particularly mentions the fact that the definition of waste in the Protection of the Environment Operations [POEO] Act is so broad that it deems construction materials that arrive at the landfill site to be waste and therefore subject to the levy. Can you perhaps talk about that?

Mr HOJEM: I think the intention of the definition of waste is so that the regulator can cover absolutely anything that is happening out there, but what has happened is that anything that comes onto the landfill is classified under the definition in the regulation as waste, so it is your road-building materials. And in the old days they were not exempt from the levy. It is only recently you can apply for an exemption, but then you are at the mercy of the EPA to decide whether that exemption is valid or not.

The CHAIR: I just want to clarify that for the Committee's benefit. If you were going to put a layer on the landfill level and you took that across your weighbridge, you were hit with a section 88 waste levy on that too.

Mr HOJEM: Yes.

The CHAIR: And if you were building a road that is beyond the weighbridge you were also hit with a section 88 waste levy on road building.

Mr HOJEM: Yes.

The CHAIR: And then you would apply to get that back and it was not always easy to get that back.

Mr HOJEM: It has become easier now, within certain criteria.

The CHAIR: I just wanted to point out how aggressive the section 88 waste levy is. The real intent of it, which was to divert waste from landfill, has gone so much further in terms of your comment about the definition of waste—it is anything that comes across the weighbridge.

Mr HOJEM: Yes.

The CHAIR: We have received evidence that many local government areas are trying to deal with waste without the ability to do it because of planning issues. For instance, if you are trying to plan an initiative in a waste recycling centre, because of the development application process, the lead-in time can almost outweigh the usefulness of the landfill when you finally get it across the line. Would you like to make any comment about those processes?

Mr FRASER: We have been through one and are going through another. We have received development approval to construct our resource recovery park, which—

The CHAIR: And how long did that take?

Mr FRASER: It was more than 18 months, I would think, from memory.

Mr HOJEM: Yes. It was two to three years.

The CHAIR: Would you consider that to be unreasonable, considering what you are putting there?

Mr FRASER: Considering that the adjoining use is our existing landfill, all we were doing is putting a similar sort of processing facility right next door. We tripped into Commonwealth legislation as well in terms of biodiversity Acts and things like that. We had to go through that process before we could apply for approval. Considering we went into it knowing all those processes, it was probably reasonable but it still feels as though it was a long time, I guess, when you are trying to get things off the ground. In that time the industry changed somewhat so we had to do our market research again about the technology we put onto those sites. We are in the middle of doing it again for an adjoining facility, which is an extension of our landfill that is again caught up in Commonwealth legislation as well before we can apply to the State for development of that facility.

The CHAIR: It must be incredibly frustrating. You are trying to reduce your landfill and put a facility there that will actually do that, and you have more planning issues than you can poke a stick at.

Mr FRASER: That is right.

The CHAIR: And all that time that you have all those problems, you are probably putting more things in the landfill.

Mr FRASER: That is right. There is still waste going into the hole, if you like, while these processes are unfolding.

The CHAIR: I have just a few more questions in terms of the larger strategies across New South Wales about waste and waste use. What is the council doing in terms of the long term—say, 2050? How are you going to manage waste in 2050? What sort of facilities are needed?

Mr FRASER: What I alluded to about the resource recovery parks, the intention is to put in alternative waste processing technology. Similar facilities already are operating in Western Sydney where we will convert the red bin waste, if you like, and other waste that is delivered to our transfer stations into commercial products, such as mulches and things like that. Our aim is that by the time that facility is up and running, 70 per cent of our waste will be diverted from the landfill. That is our long-term strategy at this point in time. There is still will be that balance of waste that will end up in the landfill, and being able to treat that would be a good option. At the moment we probably feel as though the technology is not there for that to happen.

The CHAIR: What is the percentage of waste that is going to landfill now?

Mr FRASER: Mr Hojem might be able to quote the exact percentages.

Mr HOJEM: It depends if you are looking at purely domestic waste that we pick up at the kerbside, and that is about 70 per cent, or it is about 67 per cent. But if you include all the commercial and builders waste—because in the Shoalhaven we have to cater for that, unlike some Sydney councils—you are looking at about 67 per cent also; 66 per cent in fact. There is a 34 per cent recovery on that.

The CHAIR: What can you do with $33 million to divert waste from landfill? What could you do? What percentage do you think you could get to if you were able to have access to that money, or if it was hypothecated?

Mr FRASER: I guess there is always a limitation on the technology that is currently available to process the waste. The technology we are looking at, the exact technology will be driven by the market, but it will take the organics and the green waste out of the red bin stream and process that. There will always be that component of the waste that needs some level of technology to process it into something else. Whether that technology exists at this point in time, I am not sure. Where that can go probably is really dependent on innovation in the market.

Mr HOJEM: Can I just suggest that if we had that amount of money: At the moment we have not got enough funds to be able to do everything we need to do. I would see purchasing more things like screens, shredders, compacters and bailers that would all assist, but then we would need to staff it up. If we had sufficient funds we would be able to get in sufficient staff and probably do the job a lot better.

The CHAIR: I think that is the key term—"staff it up". That means that it creates some employment where Ulladulla is, I think, on 25 per cent youth unemployment, so you could staff up.

Mr HOJEM: Yes.

The Hon. MATTHEW MASON-COX: Is it your submission to this Committee that you would want to be treated like a council like Eurobodalla or like a country council? Therefore there would be implications for that funding stream that currently goes to the Government—$300-odd million over the past few years.

Mr FRASER: I guess the issue that we may have with the EPA levy at the moment is we are paying so much and we are not seeing a lot of returns. Whether we are paying a levy or not I guess the transparency around how those levy payments were coming back for innovation and things like that is probably really important.

The Hon. MATTHEW MASON-COX: Is it your first order of business to be treated equitably with other councils of similar ilk?

Mr FRASER: That is probably where I was heading, and a bit more transparency about how that money was coming back to us to lead innovation in the industry.

The Hon. MATTHEW MASON-COX: So you would see yourself more like a Wollondilly or Blue Mountains, or would you see yourself more likely Eurobodalla, or do you think the whole system needs to be revised with perhaps a sharing of the burner across all councils?

Mr FRASER: Yes, or at least consistency so that we can look at parity between us and other councils who are also paying the levy. However the Blue Mountains got to their position, we just want to be transparent and treated the same.

The CHAIR: The Hon. Matthew Mason-Cox has a point. Are you suggesting that the upper Shoalhaven would be the equivalent of the Blue Mountains and the lower Shoalhaven might be equivalent to Eurobodalla? Would that work?

Mr FRASER: I think there would have to be one levy for the whole of the Shoalhaven because the levy also affects the domestic waste charge that we charge our residents.

Mr HOJEM: We cannot have a two-tier system.

Mr FRASER: We would need equity across the whole Shoalhaven so that everyone was paying the same.

The CHAIR: There is no equity in this. It is just the poor old ratepayer who will be slugged twice to build something and will pay at the other end for a levy that is meant to be building that.

Mr FRASER: Yes.

The CHAIR: Are there any further questions?

The Hon. SHAYNE MALLARD: Would you like to give us an explanation of why your recycling rates are so low? The other day I was at the Penrith City Council opening up a community recycling centre, which was part funded by a State Government levy. It is servicing Penrith and the neighbouring local government areas free of charge for various recyclables. They are on 70 per cent, for which I really congratulate them because our State target is 80 per cent. Why is your so low? Could you explain that to us? You are not unique. The Blue Mountains, where I live, is 38per cent. I have my theories about that. But what would be your explanation for your low level of recycling for domestic waste?

Mr HOJEM: Penrith has gone for the three bins and the food organics and garden organics [FOGO].

The Hon. SHAYNE MALLARD: Could you speak up a bit please?

Mr HOJEM: They have gone for a three-bin system with FOGO, which is food organics and garden organics in the one bin. It gets processed at Kemps Creek. Their figures are up, but if you have a look at their product quality, it is very poor. They have achieved it through that system. We aim to get that similar diversion rate using alternative waste processing technology as soon as it is up and running.

The Hon. SHAYNE MALLARD: How many bins do you provide?

Mr HOJEM: Two.

The Hon. SHAYNE MALLARD: I know there is political resistance in some areas to reducing bin sizes with the objective of reducing waste being put into landfill. You have two bins?

Mr HOJEM: Yes, we have two bins.

The Hon. SHAYNE MALLARD: Are they picked up once a week?

Mr HOJEM: The garbage is picked up once a week and the recycling is picked up once a fortnight.

The Hon. SHAYNE MALLARD: They sound good numbers. Do you have a 240 for recycling and 120 for waste?

Mr HOJEM: A 240 for recycling and there is a selection of 80, 120 or 240 for garbage.

The Hon. JOHN GRAHAM: The Committee has heard evidence from other councils about the importance of a State Government plan or strategy about waste management and that that would make a real difference, particularly in the Sydney metropolitan area. I am interested in your perspective is a regional council. Is there a need for that overarching strategy or that guidance from the State Government?

Mr HOJEM: I believe that the State Government has plans. Most of them are designed around the metropolitan area and they do not give any thought to the different challenges we face in the regional areas. If they produce a plan, they need to incorporate those challenges.

Mr FRASER: In the metropolitan area there is more opportunity for consolidation of facilities. Councils can join whereas with our distance to travel to another local government area that is quite grave, so you have to consider the cartage costs for getting that waste to and from its destination.

The Hon. JOHN GRAHAM: So is it your view that there are some big differences, but there really is still a need for an overall strategic discussion?

Mr FRASER: Yes, and really driving the innovation around the technologies that are more suited to a lower generation of waste, and the level that we can generate and process within our local government area so we are not trucking our waste out.

The Hon. JOHN GRAHAM: Secondly, we have had a series of calls for better, more accurate, and more timely data around waste collection. In particular, the City of Sydney gave some very clear evidence saying that it had struggled without that information and that it had to go get its own survey information to inform its strategy. Obviously, it is a large council and an unusual one in some ways. I am interested in your perspective as a different sort of council. Does not having timely and accurate waste data to plan with create practical problems for you?

Mr HOJEM: We produce our own data because we manage the landfill as well as the collection, so the data is there at our fingertips.

The Hon. JOHN GRAHAM: So it is not a big practical problem from your point of view?

Mr HOJEM: No.

The Hon. JOHN GRAHAM: That is useful, thank you.

The CHAIR: In terms of energy from waste policy, do you want to make any comment on how that impacts regional areas? Are the targets they are talking about the right targets?

Mr HOJEM: At the moment, when you look at the volume of waste we have, energy from waste is not a feasible option. However, once we have the technology, one of the by-products of that technology is a high-calorific residue, and in our case that will go straight to landfill. That is an opportunity for energy from waste, depending on whether there is a facility that can take it.

The CHAIR: I refer to the Hon. Matthew Mason-Cox's question to you, because I do not think we really got a clear answer. If you were to be associated with a section 88 waste levy reduction, would it be for the Blue Mountains or Eden-Monaro? Which would be the right category?

Mr FRASER: For the benefit of the ratepayer, it would be outside the regulated area, because that would have a direct impact on the charges that we have to pass on. So, from a resident's perspective, that would have to be our position.

The CHAIR: Which one, sorry? Eden-Monaro?

Mr FRASER: Yes.

The Hon. MATTHEW MASON-COX: Everybody wants to be in Eden-Monaro.

The CHAIR: That is your area, is it not?

The Hon. MATTHEW MASON-COX: That is right. It is a great place to live.

The Hon. SHAYNE MALLARD: How is your recycling?

The Hon. MATTHEW MASON-COX: Fantastic.

The CHAIR: What proportion of that $33 million goes to the regional illegal dumping [RID] squad? Is it effective, and should there be more officers on the ground? Can you make any comment about its effectiveness?

Mr HOJEM: Part of the contestable grant funding received would go to the RID squad. I cannot say exactly, but it would between $90,000 and $100,000.

The CHAIR: How effective is that over the year? Do you need more or fewer officers, and is it effective? You are getting only 5.2 per cent back from the Government out of nearly $33 million. Does that mean you need more officers in that beautiful State forest and the Shoalhaven national parks?

Mr HOJEM: As you know, it is a very big area, and we have two job-share RID squad officers at the moment. They do a fantastic job.

The CHAIR: Are they just for Shoalhaven or are they multi—

Mr HOJEM: They are just for Shoalhaven. I think they work Monday to Wednesday and Wednesday to Friday. But I am sure that if you asked them they would say they could do with much more.

The CHAIR: I am asking you.

Mr HOJEM: I do not look after the RID squad, so I am not on top of those details.

Mr FRASER: Putting more resources on the ground is always going to be a good thing, but I do not know how you gage how effective it is. People who are choosing to illegally dump will always find a way to do it.

The CHAIR: I would rather see more resources on the ground than mattresses, and there is obviously quite a spread of those across our beautiful national parks. Thank you very much. On that great note, thank you gentlemen for providing evidence. We are very thankful for the evidence that we are getting from regional and rural areas, which is very important for the inquiry. If you have taken questions on notice, you will have 21 days in which to answer them. The Committee may also so have further questions, which will be forwarded to you.

(The witnesses withdrew)

BERNADETTE McCABE, Principal Scientist (Bioresources and Waste Utilisation), National Centre for Engineering in Agriculture, University of Southern Queensland, sworn and examined

ALI EL HANANDEH, Lecturer, School of Engineering, Griffith University, before the Committee via teleconference, examined

The CHAIR: Dr Ali El Hanandeh is joining us via teleconference from Griffith University so I will set the scene for him. My name is Paul Green and I am the Chair of Portfolio Committee No. 6. This inquiry is being conducted in the Macquarie Room of the Parliament of New South Wales. The Committee members joining me today are the Hon. John Graham, the Hon. Shayne Mallard, the Hon. Matthew Mason-Cox, and the Hon. Lou Amato. Associate Professor Bernadette McCabe from the University of Southern Queensland is appearing in person. There are also members of the public present in the room. Finally, the proceedings are being recorded by Hansard. Dr El Hanandeh does not need to be sworn prior to giving evidence because he is interstate and thus he is not covered by New South Wales parliamentary privilege. Before we commence with questions, would you like to make a short opening statement?

Dr EL HANANDEH: Yes. I hold a PhD in environmental engineering. I am currently a lecturer in environmental engineering at Griffith University, Queensland. My area of expertise is lifecycle assessment, and I particularly focus on waste management. I did my PhD at the University of Sydney in 2010. My PhD thesis was entitled, "Environmental Multi-Criteria Decision-Making Under Uncertainty and Social Conflict with Applications to Waste Management." That was particularly taking a case study of Sydney. In my thesis I evaluated a number of strategies to manage the different streams of municipal solid waste generated from the Sydney metropolitan area. The strategies assessed included incineration, landfilling, alternative technologies and recycling. The assessment considered both economic and environmental implications, as well as potential social impacts. It also included a comparison between the technologies of different waste streams.

My testimony today will heavily rely upon the results of my PhD thesis and on four key articles that I co- authored in international scientific journals with particular reference to this case study—2009, 2010 and 2011. However, it is important to highlight that the results included in these publications were based on the average performance of the technologies, mainly European and North American, that were prevailing at the time they were published. Furthermore, the modelling was based on the prevailing policies, economic factors and environmental standards at the time of the modelling, which may have changed slightly since then. I would also like to highlight that I have not seen the detailed plans and design of the proposed plans. I therefore cannot make specific comments about the proposal, but I can make general comments.

The CHAIR: Associate Professor McCabe, would you like to make a short opening statement?

Associate Professor McCABE: Yes. Thank you for the opportunity to participate in this inquiry. I come here today by invitation to provide comments as a research scientist in bioresources and waste utilisation. I also hold a national role representing Australia's participation in the International Energy Agency [IEA] bioenergy program task 37, which is energy from biogas. My principal research focus is therefore the conversion of organics to biogas using anaerobic digestion. In my opening statement I would like to highlight a few key points relevant to this inquiry's term of reference which I can elaborate on based on my discipline expertise—four things, including the role of energy from waste technology and the circular economy and addressing waste disposal needs; some insight into energy from waste from the European Union and United States perspectives; the current state of play of incineration and other waste management options for different wastes and opportunities to incorporate future advances in technology; and the role of energy to waste to provide flexible forms of renewable energy and its role in the energy mix into the future.

I would also like to make a few points across an energy recovery point of view and then waste management. The energy recovery from waste is the conversion of non-recyclable waste materials into useable heat, electricity or fuel through a variety of processes, including combustion, gasification, pyrolysis, anaerobic digestion and landfill gas recovery. There are many conversion technologies that fit under the broad umbrella process often called waste to energy or energy from waste—the term used in this inquiry. Converting non-recyclable waste materials into electricity and heat generates a renewable source of energy and reduces carbon emissions by offsetting the need for energy from fossil fuels and reduces methane emission from landfills. Unlike other forms of renewable energy such as wind and solar, energy from waste is a flexible, renewable energy source so that it can be used across all three energy sectors—namely, through the production of bioelectricity, heat and liquid biofuels for transport.

Incinerators have electric efficiencies of around about 14 per cent to 28 per cent. In order to avoid losing the rest of the energy, it can be used in cogeneration—that is, combined heat and power [CHP]—and there is great opportunity for Australia to use renewable heat in the manufacturing industry in the form of process heating. Energy from waste and the various technologies that sit under this can make a big contribution to this. Unlike other renewables, it is dispatchable and provides base load energy. In addition, it provides firm electricity generation, all of which make energy from waste technology an important mix in our renewable energy future. I would like to touch on waste management in regards to energy from waste. I have observed that it has been stated on a number of occasions in previous hearings of this inquiry that the waste management hierarchy is important in recognising that there is no single waste management approach suitable for managing all materials and waste streams in all circumstances.

International experience tells us that when waste cannot be prevented or recycled, recovering its energy content is in my most cases preferable to landfilling, both environmentally and from an economic term. It can be argued that incinerators destroy valuable resources and they may reduce incentives for recycling. However, the question is an open one, as countries in Europe with high recycling rates of up to 70 per cent also incinerate their residual waste to avoid landfilling. I would like to end on a brief note about assessing the feasibility of any waste to energy product, given that would probably be my discipline expertise. From a technical, economic and social standpoint it is important to understand and integrate three key elements: a comprehensive understanding of waste streams—the feed stock; the use of appropriate conversion technology—matching feedstock with technology; and understanding the end utilisation of recovered materials that makes the most economic sense—whether it be the generation of electricity, heat or fuel or to be used on site or exported to the grid. I thank the Committee for the opportunity to appear today and look forward to the discussion.

The Hon. JOHN GRAHAM: The Committee has heard about what I would describe as upbeat assessments of the Environment Protection Authority policy currently in place in New South Wales as to energy for waste. I am interested in your perspective given your broad look across this area. I am not sure if you are familiar with the policy and whether you have any views as to how it stacks up compared with some of the other jurisdictions you have looked at.

Associate Professor McCABE: Unfortunately, I am not over the policy as it relates to New South Wales or any of that policy framework.

The CHAIR: Dr El Hanandeh, if you feel that you can contribute to one of these questions please feel free to interrupt us.

Dr EL HANANDEH: Thank you.

The CHAIR: Would you like the question repeated?

Dr EL HANANDEH: Yes. If you can increase the audio somehow for the other people it would be good. I can hear the Chair clearly but not the others.

The Hon. JOHN GRAHAM: Encouragingly, the Committee has taken evidence to say that the new policy framework for energy from waste in New South Wales is quite robust, although we have heard that some areas could be improved. Does either of you have a view about the state of the current policy framework in New South Wales?

Dr EL HANANDEH: No, I am not very familiar with that.

Associate Professor McCABE: In reading the transcription and looking at the evidence that has been provided by, say, the New Energy Corporation people from Western Australia, it appears that by comparison New South Wales seems to be more restrictive.

The Hon. JOHN GRAHAM: I turn to a specific proposal, the large-scale incinerator in Western Sydney. It has been talked about as a 1.2 or 1.3 million tonnes project. How unusual is the scale of this project? We have heard about the importance of local smaller scale projects, which have been tested around the world. This is a very big project that is being considered.

Associate Professor McCABE: By comparative standards of those operating internationally, as far as I am aware, they are about 200,000 to 300,000 tonnes per annum, which is about 20 per cent of the Western Sydney project. My first impressions would be, are they source separating appropriately so that they are in line with the waste hierarchy and taking out all the recyclables? As far as I know, it is going to be primarily construction and demolition [C and D]. It is quite a large scale project.

The Hon. JOHN GRAHAM: Given your perspective from looking at other jurisdictions, even though you are talking about some bigger waste streams in those jurisdictions, by and large are they running much smaller facilities?

Associate Professor McCABE: Correct.

The Hon. JOHN GRAHAM: Presumably that has implications for the plant for where the feedstock comes from, its quality and how far it travels?

Associate Professor McCABE: Correct. The other thing is how palatable it is to communities. When I have looked at smaller scale and more decentralised projects, you would have better management of feedstock supply. Also, if you are transporting feedstock over large distances, that means you have a cost to incorporate.

The Hon. JOHN GRAHAM: What you are really telling us is that it is quite an unusual proposal in that way.

Associate Professor McCABE: Correct.

The Hon. JOHN GRAHAM: Dr El Hanandeh, would you like to add anything or give another perspective?

Dr EL HANANDEH: I guess the size and the scale are quite large compared to what is known now, although in Germany they are now moving towards bigger ones but not to that scale. The other thing is whether separation is an issue, because there is definitely competition between the different streams, especially with the higher calorific value. I am assuming that they want that higher calorific value of the waste, and maybe therefore they will ideally be targeting things like plastics and paper as well as some other streams. These are definitely the ones that could have been recycled, if they were not diverted towards incinerator.

The Hon. JOHN GRAHAM: On the issue of the importance of the feedstock, one of the concerns expressed in evidence the Committee took from the company, the company said that what was in the feedstock did not really matter, saying that the content of the waste is not important in making an argument about the uncertainty surrounding the project. I was surprised by that view, which is not the view put to us by the EPA and NSW Health. Would you like to comment on the company's position?

Dr EL HANANDEH: Definitely the feedstock will affect the emissions that come out, but it depends on what technologies they are employing in order to clean the emissions that come out. If they are employing the proper technology and meeting all the standards then that is one thing. But without a doubt if you are taking plastics from other streams, there probably needs to be a further refining of the flue gas than just normal incineration of biomass, for example. In one of the papers I published in 2007, I had a look particularly at this and I compared different standards. When it came to different options, incineration was ranked number nine and number 10 out of 11 options. The particular concern was the increase in the dioxin emissions, but the increase in the dioxin emissions is within the limits that this company has proposed, in my understanding.

Associate Professor McCABE: With regards to the characterisation of the feedstock, it is of the utmost importance because you need to understand what sort of feedstock you have in order to match the technology and get the best calorific value out of the waste. If we look at best practice coming out of the EU and the US, for example, they would have source separation. That means that organic waste, which is food waste particularly, is unsuitable for combustion or incineration because of the wet solids, and therefore you would not get too much calorific value out of that. Food waste, on the other hand, is ideal for anaerobic digestion, on which the US is doing brilliant work.

Unfortunately, Australia still needs to work on food waste disposal as it has enormous potential. Source separation is important and I know that we are nowhere near where we should be in terms of other countries. If the waste streams are high in cardboard, plastics or any recyclable materials then that needs to be looked at first and foremost because, if you look at the waste hierarchy, those are valuable material that could go otherwise to more appropriate destinations. I would say that understanding the feedstock is of the utmost importance, from both the waste hierarchy perspective and from matching technology.

The Hon. JOHN GRAHAM: Do you think it is fair to say that if the Committee has proponents coming before it saying that the content of the waste does not matter, we should be sceptical about such claims?

Associate Professor McCABE: Absolutely.

The CHAIR: You said that the US is doing anaerobic digestion. What is it doing?

Associate Professor McCABE: If we look at some of the trends in waste to energy—and that includes a number of technologies but we will look at incineration or combustion—they are quite steady in the US. They

have around 77 facilities. Some of the smaller plants that commenced operation and that had to deal with some challenges have moved to larger facilities. As they are getting better about source segregation, they are removing organics and seeing that anaerobic digestion is a better technology in that it produces bio-electricity, fuel and heat, and what is left over is digestate, which is the sludge that can be turned into bio-fertiliser, so it is a complete closed loop. The UK is also leading the charge in the food waste sector, along with other EU countries.

The CHAIR: What are they doing different in source separation?

Associate Professor McCABE: It comes back to the waste management facility, which is crucial in terms of sorting.

The CHAIR: So it is not at the household level, but happens at the plant?

Associate Professor McCABE: So they limit contamination.

The Hon. MATTHEW MASON-COX: Drawing on your experience of overseas plants, you said there were 70 plants in the US.

The CHAIR: Seventy-seven.

Associate Professor McCABE: Seventy-odd.

The Hon. MATTHEW MASON-COX: What is the average size in terms of tonnage per year that goes through a plant like that?

Associate Professor McCABE: As I mentioned in my opening statement, my area is around anaerobic digestion [AD]. So when we talk about wasting energy, it can be combustion, pyrolysis and gasification. I do not know how much incoming tonnage they have, but it would be worthwhile to get those figures. I can get that figure on notice, along with the EU work.

The Hon. MATTHEW MASON-COX: That would be excellent. You could also see whether there is a discrepancy or difference in the EU in terms of where that sizing is going.

Associate Professor McCABE: Yes, absolutely.

The Hon. MATTHEW MASON-COX: Dr Hanandeh, I think mentioned that Germany is moving towards larger plants. I would like to understand the scale.

Dr EL HANANDEH: That is right. They have been importing waste from neighbouring countries to fuel their incinerators.

Associate Professor McCABE: That happens.

The Hon. MATTHEW MASON-COX: That is interesting. Who is funding these plants? Are they funded by private enterprise, or is it a mixture of private enterprise and government money overwriting this investment?

Dr EL HANANDEH: I think the biggest driver in Germany is the fact that they have decided to abandon nuclear power and that they want to clean up energy. As a result, they have decided that one of the options to plug that gap is to increase their incineration power, energy from waste. These are normally funded by private enterprises. Of course, there is an incentive for them from the EU under the waste diversion from landfill.

The Hon. MATTHEW MASON-COX: So it would be a subsidy from the EU to underwrite that investment?

Dr EL HANANDEH: That is right. That is my understanding.

The Hon. MATTHEW MASON-COX: Are you able to give us an idea, perhaps in percentage terms, of what sort of EU subsidy is provided to the German plants or any other plants in the EU?

Dr EL HANANDEH: I am sorry, I cannot answer that because I do not have the exact numbers. However, the subsidy would not be particular to Germany; it would be available to all European countries.

The Hon. MATTHEW MASON-COX: That is right. Can take that question on notice and provide that information to the Committee?

Dr EL HANANDEH: Yes.

The Hon. MATTHEW MASON-COX: The secretariat will be in contact with you about questions taken on notice, and they will be provided in writing.

The Hon. SHAYNE MALLARD: Dr McCabe, I refer to evidence presented to the Committee at previous hearings and from our experience in working with local government that food waste is the area we need to address in terms of landfill. We heard from the City of Sydney, which collects red bins containing mixed or residential waste. That is tipped out about at Eastern Creek and can be gone through. It still recovers only about 50 per cent of that waste; that is, 50 per cent still goes to landfill, and that is best practice in local government. Do you have some suggestions about how we should address the food waste going into landfill? It seems to be an obvious area for government policy in regard to both commercial and residential waste.

Associate Professor McCABE: Absolutely.

The Hon. SHAYNE MALLARD: What should the Committee be looking to improve this area?

Associate Professor McCABE: The first port of call would be to determine whether it is commercial or residential waste. Obtaining food waste from commercial sources, say from city markets or whatever, would be the best bet. It could come from Woolworths or Coles. Residential waste is a little harder. For example, members may know about EarthPower Technologies at Camellia, which is operating an anaerobic digester which is accepting food waste from Sydney Markets and is turning it into electricity. It is also using the sludge as a fertiliser, which it bags.

The Hon. SHAYNE MALLARD: So Sydney Markets has separate sorting? Does it have sorting bins for food waste?

Associate Professor McCABE: Yes. It is an easy one. It is the residential waste that you have asked me about. Other countries have adopted specific policies, but the main issue is the technology. The IEA's Task 37, on which I am the Australian representative, has produced some technical brochures dealing with that very area of sourced separation of organics and food waste. There is best practice out there. I can provide the Committee with some of the brochures, and I can also provide specific policies from the various countries. For instance, the UK the Waste and Resources Action Programme [WRAP], which has been funding work particularly designed to increase the adoption of food waste strategies. As happened with the example in Germany, where subsidies were provided through the EEG policies or the renewable energy acts, WRAP had subsidies—which started probably back in the early 2000s—that spurred on the growth of 8,500 biogas plants based on energy crops. That has now changed as well.

The Hon. SHAYNE MALLARD: Right. I am familiar with the hospitality sector, with restaurants and so forth. The major waste collection companies, which I will not name, charge three or four times the cost per bin for food waste bins compared to dinner waste bins or recyclables. I am aware of people who wanted to do food recycling, but the economics did not add up for them, so they just put it into the general waste stream. Why would they be doing that? Is that because there is not a market or facility to bio-digest it as you described?

Associate Professor McCABE: Yes. It is creating that market as well. You may have a feedstock, but if nobody will accept it then it will not happen. The market does need to be created. There are around about three anaerobic digesters in Australia that are currently accepting what we called bio-waste or food waste.

The Hon. MATTHEW MASON-COX: Where are they?

Associate Professor McCABE: There is one at Camellia in Parramatta, there is one at Jandakot in Western Australia out of Richgro, and Yarra Valley Water commissioned one in April this year. They are traditional waste management facilities. They are located next to the wastewater treatment plant and they accept waste. One of their biggest challenges will be obtaining a continuous supply of feedstock, and that is based on contracts that sometimes contain blanks.

The Hon. MATTHEW MASON-COX: The Committee has heard councils talking today and at other times about food scraps and food waste and how to address accommodating it in landfill to reach their targets. Our target is 80 per cent in this State.

Associate Professor McCABE: Yes.

The Hon. SHAYNE MALLARD: It is an interesting issue. I gave the example of a collection company that probably has to pick up hundreds of normal bins of rubbish and a couple of food bins, and it has to separate out the food and send it to the facility at Rhodes, which you just mentioned.

Associate Professor McCABE: Yes

The Hon. SHAYNE MALLARD: Or does it go into composting?

Associate Professor McCABE: Yes. You talk about the waste hierarchy. There is another hierarchy that you may know as the food hierarchy. Anaerobic digestion, conversion or energy recovery from food waste is above composting in that hierarchy. In Australia we are doing composting whereas internationally they have gone one step higher and said, "We can have fertiliser as well as energy from anaerobic digestion." That is where they are at.

The Hon. SHAYNE MALLARD: You are not allowed to put food waste into green recycling bins.

Associate Professor McCABE: Yes, that is right. It goes into composting. I guess it is the market, but it is about how do you get a critical mass of AD plants as well. I think the critical thing there is capital costs. The fact that we do not have the financial support that is available in other countries to achieve that is one of the main barriers for Australia in adopting biogas.

The Hon. SHAYNE MALLARD: I think we will feed that into our infrastructure discussion in our recommendations.

The Hon. MATTHEW MASON-COX: When you say "financial support", would that qualify under the renewable energy certificates?

Associate Professor McCABE: You do know that we have the large scale?

The Hon. MATTHEW MASON-COX: Yes.

Associate Professor McCABE: In terms of being an economic, feasible project, the best way for a plant to set up an AD process is to have utilisation of the product onsite through displaced fossil fuels. For instance, a red meat processor may be able to treat wastewater from the plant using anaerobic digestion because it needs to be treated anyway to be compliant. Using the natural process of anaerobic digestion, it will capture the methane and feed it back to the boilers. It can make economic sense given the rising cost of natural gas.

Dr EL HANADEH: One of the analyses that I did earlier looks at using anaerobic digestion for the food waste and the green waste rather than composting, and then recycling what is possible and sending what is left to the landfill. Assuming that you are able to claim credit for the carbon dioxide offset and that you can sell the electricity at a preferential price, that option will be cheaper than what we are doing now and cheaper even than incineration.

The Hon. MATTHEW MASON-COX: That would, of course, depend on what subsidy you could get for your electricity price.

Dr EL HANADEH: That is exactly what I am saying. If you can set the price for electricity at a preferential rate—22¢ is the assumption—and you can get $25 for every tonne of carbon dioxide you offset then that could be a financially feasible option.

The Hon. MATTHEW MASON-COX: Perhaps you could send the Committee those figures. Can comment on the relative efficiency of the anaerobic digestion [AD] plant in terms of other sources of energy?

Professor McCABE: In terms of its actual efficiency in treating waste, it is around about 75 to 90 per cent efficient. If we look at energy recovery—which is what we are looking at—it all depends on its annualisation. If you are going to send it through a genset, it is probably at best 38 per cent or 42 per cent. That is why we would say the best use is through cogen. That is the best way when you capture heat. This is why I think the one gap that can be filled in this whole waste to energy debate is around the best utilisation of the product. In terms of filling that gap in process heat—the manufacturing—that would be a good way to do it. There are examples internationally. I think the United Kingdom they had renewable heat incentives. Of course, the northern hemisphere will require more energy to heat houses. That opportunity in Australia lies more in manufacturing industry.

The Hon. MATTHEW MASON-COX: Do you have any figures about cost per kilojoule, for example?

Professor McCABE: I can take that question on notice.

The Hon. MATTHEW MASON-COX: I am trying to get an understanding of efficiency, and obviously there might be associated environmental benefits as well. It would be useful to get an understanding regarding producing generation, electricity or heat, cogen, depending on the location of the plant.

Professor McCABE: That also is dependant on the type of technology. Anaerobic digestion can go anywhere, to what we call, in treating manure from piggeries, the wastewater, to very simple, cost-effective anaerobic lagoons, which are covered with HDPE. There are also in-vessel, highly engineered anaerobic digesters. That should be factored into the return as well.

The CHAIR: HDPE?

Professor McCABE: High-density polyethylene.

Dr EL HANADEH: The thing is this anaerobic digestion would work for organics and mainly the food waste. The incinerator would be happy to not take that because of the high moisture content and low-energy value. I am not sure, but I think it is important to take note of this point.

The CHAIR: It is a fair point.

The Hon. SHAYNE MALLARD: We are not discussing only the incinerator.

The CHAIR: Given we are reviewing the energy resources of New South Wales available from waste, do you have anything by way of recommendations about hypothecation of section 88 waste levies or anything that we can take from your expertise that might be helpful to the Committee?

Dr EL HANADEH: There are two things to consider with regard to the levy. First, there should be some incentive to use cleaner technology. Landfill is bad but when you consider how bad it is and if we can recover some of the energy, that is one option that should not be discredited. I believe New South Wales is doing that already, especially at the new landfill in Goulburn. That option with the levy remains viable, otherwise you would be killing the existing operation. The other thing is encouraging the alternative options such as anaerobic digestion. As the professor said, one of the biggest problems getting it off the ground is providing capital. If anaerobic digestion is able to claim some credit for the offset of carbon dioxide and perhaps to get preferential prices for electricity then that is would probably be a win-win situation.

Professor McCABE: From a waste management point of view, it would be good to have some sort of structure around how money can be hypothecated back to the facilities so that they have employ best practice, which would ensure that the waste streams were properly separated and recyclables go to recycling. I refer the Committee to a report from the European Commission's Joint Research Centre, Science for Policy Report "Towards a better exploitation of the technical potential of waste-to-energy." I have forwarded that to Ms Mihaljek, and it could be bedtime reading. It is a recent report showing the current state of play with technologies. It also outlines the six major waste streams going into some of the incinerators. It is household waste and other waste, which is the last line of that source separation.

In countries that have state-of-the-art separation, there will still be some left. That is indicative of the point I made that some of it will always have to go to landfill. I think if we can get our waste management facilities to a point where they can best separate that out then we will have a clearer understanding of our feedstock. I think that was the start of the discussion. I also recommend that the Committee start some conversations about a circular economy and what it means for New South Wales and, indeed, the nation. Legislative guidelines would also help to drive waste management because they are key to a circular economy.

The CHAIR: We have already had the conversation with previous witnesses about a circular economy. Hopefully it will evolve into a recommendation that will be focused upon. Thank you for appearing before the Committee today. You have taken some questions on notice. Ms Mihaljek and the team will be able to help you with those. The Committee needs the answers back within 21 days. In light of your evidence, we may send you further questions. We appreciate your taking time this afternoon to contribute to this important debate and inquiry, and we look forward to producing a significant report to provide a future waste strategy for this State. We thank you very much for your time.

(The witnesses withdrew)

ROGER BLIGH, Sales Director, Metals, Energy and Water, Outotec South-East Asia Pacific, affirmed and examined

The CHAIR: Do you have an opening statement you would like to present?

Mr BLIGH: Yes, please. I have a couple of documents and I am going to refer to a couple of pictures.

The CHAIR: What is that?

Mr BLIGH: I have some aerial shots of a plant. I think it is useful. The second page is the one members should look at.

Document tabled.

Mr BLIGH: I appreciate the opportunity to appear before this Committee in relation to this very important issue. It is important to Sydney, New South Wales and Australia. Briefly, to introduce Outotec, it is a minerals, metals and energy technology company based in Finland with technology centres in other countries, including Germany, the United States and Australia. Our portfolio includes the provision of thermal processing solutions for recovering energy from municipal waste by mass and even sewage sludge. Currently, we have seven energy waste projects being constructed in the United Kingdom, that will generate a combined total of 90 megawatts of electricity.

I have provided information in the pack on some of those projects in the UK. I am going over a little bit of ground that you have seen before, but it is good to see some practical examples. We thought it was important to present to this inquiry information regarding modern waste to energy facilities in some of the overseas jurisdictions; we are probably not the first to do so. We believe these facilities fit into and are not in conflict with our clients' hierarchy and circular economy targets. I have provided some links in our submission on this subject, which I am sure you have had a chance to look at.

Rather than going through all those details, I thought it was useful to take you through a practical example. I lived in Frankfurt in Germany for three years. It is a major financial hub of Europe, as you know. It is the home of our Outotec technology team for fluidised bed combustion technologies, including this one for waste to energy. Frankfurt, like all cities in Germany, is highly compact. There are 737,000 people, on average, living within a radius of less than 10 kilometres from the city centre. Germany is one of the leading countries pursuing waste minimisation, renewable energy and a circular economy. I am sure you have heard many references to Germany in the discussions today and in the past.

The population in Germany is highly motivated about these issues, and is highly sensitive and proactive when it comes to issues of air, water and soil pollution. Municipal waste is simply not allowed to be sent to landfill in Germany due to the known pollution risks to air, soil and water—I stress all three. They regard putting waste in the ground as a non-solution. Germany has been at the forefront of setting the environmental standards for the technologies introduced to avoid waste going to land fill. A lot of the European Union standards we have mentioned today, the legislation was first introduced in Germany in the 1990s.

I can attest to the strict effective systems in place for avoidance and recycling from personal experience. By law, manufacturers own the packaging of their supplied goods and they are responsible for taking them back if they are handed back. There are no plastic bags in supermarkets—I had to carry items home in my backpack. There is cashback on glass, but there are three definitions of glass—white, yellow and green. They are down to fine levels of separation.

As you can see in the picture, there is a waste to energy plant within five kilometres of the city centre that handles 250,000 tonnes per annum of municipal waste. It is RDF—refuse derived fuel. It is right in the middle of Frankfurt within five kilometres of the city centre. It is also within five kilometres of Bad Homburg in the north. The Sydney equivalent would be Point Piper. It was constructed in the 1980s. Unlike the facilities here, which were shutdown, this facility was upgraded in 2006 to more modern technology. It is very much part of the framework of their waste to energy and circular economy. We have heard about that in evidence today.

The Frankfurters would give this advice: There is absolutely no conflict between driving a circular economy and having a waste to energy facility. Frankfurt has achieved an 18 per cent reduction in MSW in the past 13 years from an already low base. The community engagement is another point that has come out today. There needs to be a sense of owning the problem and therefore sharing the ownership. This is particularly relevant when you have a large waste facility servicing all of Sydney. The third point is modern state-of-the-art technology. With the right operating and monitoring regimes in place, overall impact on air, water and soils is

substantially less than our current out of sight, out of mind non-solution of sticking waste in the ground. I trust this example assists in providing some insight into the situation in Europe and how extraction of energy value from waste is seen as an integral part of the management hierarchy in the European Union.

The Hon. JOHN GRAHAM: Thank you for your evidence. You have set out where we might head, indeed, where you suggest we should head. The evidence in front of the Committee to date is that there is now a policy in place from the EPA—there had not been before. The waste levy is the key driver in this area. Maybe it should be a little higher, but it is the key driver, it is effective.

Mr BLIGH: Yes.

The Hon. JOHN GRAHAM: There is no strategy in place. That is one of the gaps outlined by the Government. My question is what does it take to get from where we are in New South Wales to the sort of vision you are outlining? Now we have got a policy and a waste levy, at about the right rate or it maybe little bit low, is this going to happen, or is this something else we need to do?

Mr BLIGH: My impression, and I have not done the economic modelling of the situation in New South Wales, although we are doing that at the moment. The situation in Europe is that there are higher levels and it is more attractive there, particularly things like power. If you take the seven cases in the United Kingdom, our gasification technology got an extra lift over other forms of waste to energy combustion, which made it very attractive, and that is why there are seven projects now. They do have higher levies. Nevertheless, I do not think the New South Wales levies are terribly low, if you look at the charges being levied. It is a matter of making sure that that money is being driven towards the solution rather than—the way I tend to see it happening at the moment, it fills either Government coffers or someone else's coffers and it does not end up being a real solution.

When you need that money, it is more seen as a profit, and that should not be the case. There have been a number of points made on that. I would make the one point very much in agreement with some of the earlier evidence that the biomass—the household waste—is not a particularly good source of energy. Anaerobic digestion is a good alternative. They should be separated. Obviously, the higher the levies that are available, the more likely you are to get something economic, but there is always a limit to the government coffers. I think it is more a matter of direction—ensuring that the money is spent in the right way rather than necessarily having more levies.

The Hon. JOHN GRAHAM: On that question of change in the culture about separation, what can we do to speed that up? It is partly a cultural gap; it is partly an infrastructure issue. What can we do to bring that about?

Mr BLIGH: I guess we are a technology provider for, shall we say, the gasification and combustion process. One of the things that we think is in favour of our technology is that it cannot actually take mass burn-type material. It is designed that you actually do the separation, that you are down to a certain size distribution and that you remove a certain amount of metals. The fluidised bed system cannot take bulk heavy metal—someone's pram or something—which tends to mean it forces you to go into doing recovery. So the technology is not designed to handle gross solids; it is designed to handle material where you have got rid of most of the metals down to only a few per cent. By using those kinds of technologies you stop people wanting to take shortcuts. That is where there is a lot of additional cost if there is not sufficient real monetary value in the recovered materials in waste to energy. I have to comment again that we are a technology provider, so we are not as knowledgeable about the end users' or owners' finances and economic models.

The CHAIR: In terms of your experience with these energy from waste facilities, do you know much about the contaminants and the outcomes? One of the community concerns with this sort of technology is the particles coming out when 20 per cent of the feedstock is unknown.

Mr BLIGH: We have a clear definition when we are talking to our customers. If we want to meet the EU standards, which is our standard—we do not really care what country we are in; we are an EU-based organisation and we always design to EU standards or better—we have a set of requirements that they meet in terms of the fuel. It is not only the size distribution issue, and it is not only the actual metal and glass content. It is also the heavy metals and chlorine. Surprisingly, the level for chlorine is more of a concern not so much of dioxin. We do not believe at the percentages we are talking about that it makes a big difference whether it is 0.8 or 0.5. What it does do is give you a lot of issues with corrosion and the reliability of the plant. We place limits on those heavy metals simply because with any given dust removal technology there are always heavy metals attached to that dust. If you are trying to achieve an EU standard of X, Y and Z for a heavy metal then that heavy metal tends to be attached to the dust.

I would challenge an earlier comment that you should have a technology that can handle anything. Unless you want to take dust levels down to nothing, dust is not something you measure on the way in. It is

generated in the process and it carries heavy metals. We have activated carbon systems for tracking down mercury. We specify an analysis. We do not really care where the waste has come from; it is the analysis—the carbon, hydrogen, oxygen, nitrogen and heavy metals that make it up—that matters to us.

The Hon. LOU AMATO: Can you measure carcinogens as well?

Mr BLIGH: The gasification and combustion process tends to completely destroy all the atomic structures of everything that is there.

The Hon. LOU AMATO: So it does or it can?

Mr BLIGH: It does. We are up at 850 degrees to 900 degrees Celsius. People insist on higher temperatures for hazardous wastes. A lot of that is leftover from older technologies that did not have such even combustion processes as there are in a fluid bed. At 850 degrees to 900 degrees, basically everything is atomised. For instance, in the De Novo synthesis process the dioxins are all formed downstream. It is not something that is in and out. It is actually formed in the process, so you have to look after your process to avoid dioxin formation. It is the same with many organic contaminants. A lot of these chemicals are managed by having the right process. Things like carcinogenic organic compounds, for instance, are completely destroyed in the combustion process. You have to avoid reconstructing them in the synthesis process later.

The Hon. LOU AMATO: But at the end of the process there is still leftover material. What do you do with that material? Do you kiln it and brick it?

Mr BLIGH: Most of the dust is collected as ash in the bottom ash—what we call boiler ash because we do not have a bottom ash—but you still have a dust which after your normal gross separation of cyclones and everything else then goes through a fabric filtration process. First, you are precipitating with lime, typically, for the heavy metals, and also capturing any acid gases. You are using activated carbon first. That trace gas is then run through a fabric filter, which gets you down to these very low dust levels. In fact, the dust levels leaving the plant are not so much a function of the feed product itself. The total dust level is defined by your clean-up—your fabric filter design. But the heavy metals attached to the dust are where the issue comes about, in and out. If there are lots of cadmium batteries in there then small amounts of that cadmium will be attached to that small amount of dust. That is the reason we have set limits on what needs to come to the plant. I hope I have not got too complicated.

The Hon. LOU AMATO: Not at all.

The Hon. MATTHEW MASON-COX: How much does one of these plants cost?

Mr BLIGH: It depends a little bit on where you are building. With a plant like that, we are talking orders of magnitude of $100 million in round figures.

The Hon. MATTHEW MASON-COX: And we are talking about 200,000 tonnes a year.

Mr BLIGH: Typically. Most of the plants that we see are in that range—a couple of hundred thousand. To be fair, I have not read the submission for Eastern Creek in detail, but my understanding is that it is four trains; it is not just a single plant. So each one is probably about 250,000 tonnes, but they are putting it all in one place. I come back to this big point: We talk about emissions and these trace elements of dioxins and everything else, but everyone is ignoring the fact that the diesel trucks that are being used are generating much more. We have heard about all the trouble with diesel. We have a mountain of a problem here and we are looking at the molehill over in the corner.

The Hon. LOU AMATO: I think trucks have gone up to Euro 6 specs. It has dramatically improved, at least in the past 10 years.

Mr BLIGH: Yes, it has. And we have seen those improvements. I have a colleague who is living about 500 metres from that plant. His concern is not the emissions from that stack; it is the vehicles going past. There is an economic size for one of these plants. If you go too small, you are burnt by the economies of scale. But if you go too big, you get into this problem of, "Why are we taking everybody else's waste?" I think that is the situation in Sydney, and understandably.

The Hon. LOU AMATO: One of the concerns is because, unlike the trucks that are moving and travelling up and down the freeway so that the chemicals are all being dispersed, the plant room is fixed.

Mr BLIGH: Exactly.

The Hon. LOU AMATO: It stays there and it pumps chemicals out.

Mr BLIGH: Yes, and it gives a different perception.

The Hon. LOU AMATO: The concern for residents in particular is, "What are we breathing? What are our children breathing?" That is what the concern is.

Mr BLIGH: Exactly.

The Hon. LOU AMATO: What sort of intake population do your plants facilitate? It is like a city?

Mr BLIGH: It is around about a million, that kind of number. I should have those kind of numbers. I could take that point on notice.

The CHAIR: Okay.

The Hon. MATTHEW MASON-COX: Frankfurt has 700,000, you said.

Mr BLIGH: Yes. Frankfurt is about 700,000 and I think it covers pretty much all of Frankfurt, that plant, yes.

The Hon. SHAYNE MALLARD: That fits in with what local government representatives told us. I think you were here for today's evidence. It seemed like 600,000.

The Hon. LOU AMATO: Places like Liverpool, Blacktown in Campbelltown, that sort of area.

Mr BLIGH: It is probably fair to say that Frankfurt would have an even smaller collection. In other words, for the population the quantity of waste going to would be smaller than what it is here, but that is what we should be aspiring to. New South Wales is doing well. Frankfurt is doing better, but they are very conscientious people. I could not believe when we first got there that we had six bins at the front of the units for everybody. They would break up their things and they would put a little bit in here and the plastic in there.

The Hon. MATTHEW MASON-COX: It is a cultural thing. They have been doing that for many years.

Mr BLIGH: It is cultural, yes.

The Hon. MATTHEW MASON-COX: They understand all that, but also the regulations underpin behaviour. You were saying that, essentially, it is compulsory that nothing goes to landfill, basically.

Mr BLIGH: Correct.

The Hon. MATTHEW MASON-COX: That is a legislative framework.

Mr BLIGH: That is right.

The Hon. MATTHEW MASON-COX: In terms of driving the economics of these projects with that sort of regulation, obviously there is a massive subsidy coming from government.

Mr BLIGH: Yes, but they had to deal with the real cost of not putting it in the hole in the ground.

The Hon. MATTHEW MASON-COX: What sort of efficiency in terms of electricity generation do you have?

Mr BLIGH: Typically the plants that have our technology are somewhere upwards of 25 per cent but not a long way in terms of pure electricity.

The Hon. MATTHEW MASON-COX: Would you be able to find us the figures that underpin the economic case? Is that something you are able to do without breaching commercial-in-confidence?

Mr BLIGH: Yes, we could probably do that.

The Hon. MATTHEW MASON-COX: Just as a rule of thumb.

Mr BLIGH: We could give a bit of an idea of what the technology would do. Our technology has its differences for mass burn, but in terms of the overall efficiency it is still a combustion process at the end of the day.

The Hon. MATTHEW MASON-COX: That is right.

Has Mr BLIGH: The difference in Europe, of course—and it was mentioned here before—is that they can utilise the waste heat for residential heating and they do so.

The Hon. MATTHEW MASON-COX: How do they do that?

Mr BLIGH: They have a centralised system for running water, literally around to all the houses. This is the irony of it all. If you stick the plant right in the suburb and people are all getting free heat from it, guess what? They are not worried about the stack because they are getting free heat or low-cost heat.

The Hon. SHAYNE MALLARD: When did they phase out the landfill?

Mr BLIGH: That is a good question. I do not know, but I could find out when it was phased out.

The Hon. SHAYNE MALLARD: Was it after a transitional period of time and then were their financial incentives to develop alternatives? We would be very interested in that information.

Mr BLIGH: I will find that out. When I was living there was 2006-08 and I think it was already phased out then, but maybe it was legislated.

The Hon. SHAYNE MALLARD: Across Germany?

Mr BLIGH: I will find out. Certainly Frankfurt could be different from across Germany.

The Hon. SHAYNE MALLARD: Could you give us the information on that?

Mr BLIGH: I will do that.

The Hon. MATTHEW MASON-COX: It might be useful to also understand what the subsidy is from the state for residents. If you could just give us a ballpark figure so that we can understand what sort of subsidy we would need to look at here for different plant structures, that would be good.

Mr BLIGH: Right. We have also got quite a lot of experience in the United Kingdom [UK] with these projects, and the UK has been even possibly more attractive than Germany recently.

The Hon. SHAYNE MALLARD: Because it is colder?

Mr BLIGH: Yes, it may be because it is colder; I do not know. But I will look at the UK. The other point there is that when you look at the capital cost of one of these plants—and maybe you have seen some pictures of some plants—there are many plants out there that would spend as much on the architecture and the beauty and the nice colours as they do on the core plant itself. The cost of the plant is highly variable. What we can talk about is the core piece of kit in the middle that does not look all that pretty. A lot of places actually add a lot of cost overseas. I would suggest in Australia, where we have more gaps between where the people or the residents are and where the plants are, do we really need to spend that feel-good money?

The CHAIR: In your brochure, page 43 has an interesting comment by one of your people. It states:

> Trends in regulation in international climate change processes are shaping the waste to energy business arising. Predictability is crucial for business and this is an important message for regulators and decision-makers.

Do you wish to make a comment on that? In the light of climate change and all the discussion and debate going around, where does the energy from waste sit in that paradigm? Is it good for it, or bad for it?

Mr BLIGH: I think the clear issue for us—as, shall we say, technology providers wondering where the next lot of projects are going to come from—has been, in this country certainly, the uncertainty when it comes to legislation; that is, what direction the nation is going in. That applies to waste for energy. I have colleagues in the area of wind. My son is working in hydropower, the turbines in estuaries, and it is the same story. Australia is really losing out at the moment because there is no legislative certainty about what to do and what to do next. No-one wants to invest in coal because it is going to be hitting the end of its day, but they do not know what the alternatives are.

I think this is probably a general statement: We, as a technology provider, are having a lot of uncertainty about where our next projects are going to come from in this part of the world simply because of legislative uncertainty whereas in Europe we have seven in the UK and we have more coming. We are stretched there to provide the services to provide the plants whereas here we are having trouble even seeing the projects get to a point where we are even being spoken to.

The Hon. SHAYNE MALLARD: That is where we intersect with the Finkel review on the issue of certainty in the electricity sector.

Mr BLIGH: Yes. If we could get some legislative certainty, whatever it is, I think it would allow people to start moving on.

The CHAIR: It is interesting—retail politics and the environment that we are in, short terms and short-term thinking.

The Hon. SHAYNE MALLARD: Or inertia.

Mr BLIGH: That is right.

The CHAIR: We just cannot afford to take risks.

Mr BLIGH: Of course, when I say "we", I really mean our customers. They are all saying, "What about this?" We must have I do not know how many projects just sitting around in the ready-to-go mode, but the customers are just not prepared to spend the money.

The Hon. SHAYNE MALLARD: In Australia?

Mr BLIGH: In Australia particularly.

The CHAIR: In that same brochure you have one of the topics that you have highlighted which states "waste to energy technology is in demand". We took evidence that may be energy from waste is beginning to be shut down across Europe.

Mr BLIGH: I am not sure where that came from. I have no idea where those ideas came from.

The CHAIR: You are saying that the evidence would not show that—they are actually growing?

Mr BLIGH: The reality on the ground is completely different, yes. Our team in Europe—again, I think we probably have four or five tenders on the go at the moment for all projects in the UK. It is quite a hotspot. They will eventually satisfy their needs. They are trying to solve their problem now so that will be where we are next; but it is certainly not the case in Europe that they are shutting plants down. This plant here was upgraded in 2006 and there are no plans for shutting these plants down in Europe.

The CHAIR: We took some earlier evidence talking about retrofitting and upgrading, which is interesting.

Mr BLIGH: Yes.

The CHAIR: Would that be the filters and different things of better technology that would catch the particles or something?

Mr BLIGH: Yes. You can retrofit by gas cleaning. I guess I am a bit biased but we would suggest that our technology, going towards a fluid bed technology, is actually superior. It gives you inherently lower conditions before you start gas cleaning, but that is not to say that you cannot achieve the standards with, shall we say, an older type of designs.

The CHAIR: Thank you for your time. If there are no further questions, let me say that your evidence is invaluable. Thank you for the pack from which I have got a couple of things already that will be tremendously helpful in the report and the inquiry.

Mr BLIGH: That is good.

The CHAIR: Thank you for your time. Your evidence invaluable and will be tremendously helpful to the Committee in preparing its report. We appreciate your time, Mr Bligh. You have taken some questions on notice. The secretariat will forward them to you in writing and you will have 21 days in which to answer them. In light of your evidence, members may have further questions, which the secretariat will also forward. Thank you for appearing before the Committee today. Your evidence has been very helpful.

(The witness withdrew)

MARK WILLCOCKS, Director, Active Tree Services, affirmed and examined

The CHAIR: Do you wish to make an opening statement?

Mr WILLCOCKS: My company looks after most of the trees within the vicinity of Parliament House. We look after the trees the way along Macquarie Street for the City of Sydney, and we are also responsible for managing the green waste generated by the Botanic Gardens. We take it out of the gardens and recycle it and return similar material to the Botanic Gardens.

I have been in the waste to energy business in the supply of firewood. About 30 years ago, I had a large firewood business, but I was out of it for a long time. More recently, we have done a lot of work with trees around Sydney and south of Sydney down to the airport. We have been generating fairly large quantities of mulch, which is what you make by putting branches into wood chippers. It is a problem now, and I see it becoming a bigger problem in the future. I started doing research on what could be done with the mulch other than what is currently done; that is, it is used predominately as a groundcover to control weeds. There is much more than we need and we are hauling it out of town to use it. I have looked at a number of different processes. A lot of information is now readily available on the internet, and I came up with a proposal to compress the woodchip into a briquette. I brought a briquette with me. The advantage of briquetting is that the wood is dried out, so it is a better fuel than firewood and it is used in either domestic fireplaces or in heating factories and things like that. It is a useful material.

The Hon. MATTHEW MASON-COX: How much would it retail for?

Mr WILLCOCKS: Less than firewood, or the same sort of price. It can be less than firewood because it is produced from a waste. At the moment the input costs are negative, rather than positive.

The Hon. MATTHEW MASON-COX: Do you sell a lot of it?

Mr WILLCOCKS: We have not been allowed to get it out. I would love to. I can buy it in Bunnings, but it is not made in New South Wales. In doing the research, we found the technology and the supplier. We had two outside experts do a proposal to go to the EPA and to explain what we were trying to do. Given that I thought we had ticked a lot of boxes, I thought we would get somewhere. We did not get anywhere, partly because of the waste hierarchy and partly because this is considered a waste, so we get stuck in the same basket as other waste technologies. It is not really a waste. It is common in Europe, and the EPA says that it takes most of its influences from Europe, apart from this one. That is my opening statement, thank you.

The Hon. LOU AMATO: To better satisfy the EPA about the problems associated with the product, it might need to know the types of materials and woods that are being used in that process.

Mr WILLCOCKS: Wood is generally wood.

The Hon. LOU AMATO: There are all different types of woods.

Mr WILLCOCKS: That does not really have any influence. Firewood is wood as well.

The Hon. LOU AMATO: But where does it come from?

Mr WILLCOCKS: It comes from trees.

The Hon. LOU AMATO: My better half is a horticulturalist.

Mr WILLCOCKS: Different types of trees produce different energy, but I think—

The Hon. LOU AMATO: Exactly, so there are different types of energy. Some of those trees are renewable trees, some are plantation trees and some are not. These might be some of the questions that the EPA might ask. That is what I was trying to get at; I was not trying to be smart.

The Hon. SHAYNE MALLARD: To be clear, the product this gentleman is talking about is the by-product of urban tree management. It is not from forests or from land clearing; it is from urban tree management, including street trees, park trees, offcuts, and things like that. I used to be with the City of Sydney, so I understand your services very well. In the waste hierarchy, what does the EPA expect you to do with the volume of woodchips that you produce from tree management?

Mr WILLCOCKS: Mostly groundcover; that is the preferred option.

The Hon. SHAYNE MALLARD: What about composting and the big commercial composters?

Mr WILLCOCKS: From our point of view, that is a more expensive disposal system. I gather there is a huge over supply in the compost area as well. There is a lot of stuff sitting around that is gradually degrading, and it degrades into carbon dioxide.

The CHAIR: There are different qualities and different businesses selling at different levels. Someone could flood the market with a really cheap and nasty product, but you might do the right thing and of a good-quality product and people do not know the difference.

Mr WILLCOCKS: We do not do it because we are not licensed composters, and it is a very different process. We can sell mulch.

The CHAIR: I am talking about some of the challenges of wood chipping. If there are some cheap and nasties in the industry it can—

The Hon. SHAYNE MALLARD: I know the illegal dumping of woodchip was an issue in Liverpool when I worked there. Trucks were dumping it out there because of the disposal issue. Why is the EPA saying you cannot do this?

Mr WILLCOCKS: There is a question about the input. From what I can gather looking around the world, wood is pretty much the same. There are slightly different calorific values. The first issue is a hierarchy, which is set by the policy department within the EPA. They are all pretty helpful, but there are two different groups. On the operational side, people get driven by policy that has been made, and the policy on hierarchy seems to be very strictly set at the moment. There is a possibility of making char out of it, but you cannot sell char. In fact, that is similar to burning it.

We have to go through two steps. We have to become an eligible waste fuel, which we are not, and then we have to get permission to burn it in a boiler. Forestry products are eligible waste fuel. We make the same stuff, but we are not eligible waste fuel. The big hurdle is not there; the big hurdle is actually getting permission to set up a boiler, with the amount of testing and the amount of regulation as to the design and the manufacturer of the boiler. It is hard for me to say why they do not want it, but that is my experience.

The Hon. JOHN GRAHAM: But some similar big plants are up and running in New South Wales.

Mr WILLCOCKS: There is one very big one. Part of my thinking is that they should not be large; they should be small. Part of the reason I mentioned the Botanic Gardens a is that it has a greenhouse that could easily be heated by this sort of material.

The Hon. JOHN GRAHAM: In some ways you can understand the scepticism about some of the bigger plants, because the argument is about what wood waste is diverted into those plants. Your case is built on the fact that this is urban tree waste. You are not generating it but making an argument about the best use of it.

Mr WILLCOCKS: Yes. I listened to the last witness talking about truck movements. The EPA does not seem to have a remit to look at the global situation. We would be hauling this stuff 100 kilometres, whereas it could be used pretty much right where it is generated.

The Hon. JOHN GRAHAM: Where is it going now?

Mr WILLCOCKS: A lot of it is going to some of the big roadworks around Sydney. Some of it is going to mining sites in the Hunter. Some of it is going to general landscapers. Once the roadworks stop, there will be a much more serious problem.

The Hon. SHAYNE MALLARD: The roadworks will never stop.

Mr WILLCOCKS: That would be good.

The CHAIR: Mr Willcocks, is your issue that you have this innovative product but it does not qualify under the terms of the EPA?

Mr WILLCOCKS: Yes, but it is not just our product. Last year, when I was investigating it, I went to Europe. I went to the enviro-culture show in England, and probably half the show was designated to using wood for energy, partly because there is a huge subsidy on energy—I think they get 13¢ a kilowatt. Hundreds of boilers go into houses and all sorts of places, and as long as it is waste that is not being generated by forestry, it is a much better use than anything else.

The Hon. SHAYNE MALLARD: We might put some questions on notice about this to the EPA.

The CHAIR: Yours is a worthy cause for us to question; I think it is very innovative and creative. There is a great opportunity to use your product, so consider yourself heard, Mr Willcocks. We may put some

further questions on notice in light of your evidence, and the secretariat will help you to prepare your answers, which we would require within 21 days. Thank you for bringing in your product, which is amazing.

The Hon. LOU AMATO: Bunnings has fire starters made from compressed wood.

Mr WILLCOCKS: They do and they have some sawdust logs.

The Hon. LOU AMATO: We do not know where this stuff is coming from.

Mr WILLCOCKS: A lot of the Bunnings stuff made from compressed sawdust comes from Western Australia.

The CHAIR: Western Australia? We can produce it right here in New South Wales. We will put Bunnings on notice. Thank you for your time, Mr Willcocks.

(The witness withdrew)

The Committee adjourned at 15:44