

REPORT ON PROCEEDINGS BEFORE

**SELECT COMMITTEE ON PROPOSED ENERGY FROM
WASTE FACILITIES**

PROPOSED ENERGY FROM WASTE FACILITIES

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At Macquarie Room, Parliament House, Sydney, on Monday 4 May 2026

The Committee met at 9:00.

PRESENT

The Hon. Nichole Overall (Chair)

The Hon. Mark Banasiak
Dr Amanda Cohn (Deputy Chair)
The Hon. Dr Sarah Kaine
The Hon. Natasha Maclaren-Jones
The Hon. Peter Primrose
The Hon. Rob Roberts
The Hon. Emily Suvaal

* Please note:

[inaudible] is used when audio words cannot be deciphered.

[disorder] is used when members or witnesses speak over one another.

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The CHAIR: Welcome to the third hearing of the Committee's inquiry into proposed energy from waste facilities. I acknowledge the Gadigal people of the Eora nation, the traditional custodians of the lands on which we are meeting today. I pay my respects to Elders past and present, and celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of New South Wales. I also acknowledge and pay my respects to any Aboriginal and Torres Strait Islander people joining us today. My name is Nichole Overall, and I am the Chair of the Committee.

I ask everyone in the room to please turn their mobile phones to silent. Parliamentary privilege applies to witnesses in relation to the evidence they give today. However, it does not apply to what witnesses say outside of the hearing. I urge witnesses to be careful about making comments to the media or to others after completing their evidence. In addition, the Legislative Council has adopted rules to provide procedural fairness for inquiry participants. I encourage Committee members and witnesses to be mindful of these procedures.

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Mr STEVE FEDOROW, Director Community and Environment, Hornsby Shire Council, sworn and examined

Mr CHRIS HORSEY, Manager Waste Management, Hornsby Shire Council, sworn and examined

Ms VANESSA PARKES, Director City Living, Blacktown City Council, sworn and examined

Mr LUKE COOK, Acting Manager Environment, Blacktown City Council, sworn and examined

The CHAIR: Welcome and thank you for making the time to give evidence today. Would any or all of you like to begin by making a short statement?

CHRIS HORSEY: Yes. On behalf of Hornsby Shire Council, we would like to note that waste disposal capacity is quite essential for the Sydney community. Even though we have very good recycling rates, about 50 per cent of our waste still requires some form of disposal. At present there really are only two options for that, being landfill disposal, and energy from waste and emerging technology. Over the past 25 years there's really been inadequate strategic and government-led planning on waste infrastructure, which is now causing a waste infrastructure crisis. There's no responsible agency within government organisations for strategic planning of waste and the delivery of waste infrastructure. Local councils alone or regions of councils under joint procurements will not deliver the required waste infrastructure that a city of five million people requires.

Landfill capacity expires in 2030, and even with temporary extensions to some existing landfills, it's highly doubtful that either new landfill capacity or energy from waste will be ready in time. That is a major concern for local government needing disposal capacity, so we are quite worried that we're going to drive off that cliff of having somewhere to send our waste. For energy from waste there have been no real social licence campaigns that have been held to address community concerns on a broad scale. That's not just for energy from waste, but it goes across all waste infrastructure including future landfill developments if they are required. There really only are two options for waste disposal at the present time, being energy from waste or landfills.

When we consider alternatives to energy from waste, often we're talking about resource recovery and additional recycling. Whilst they may be valid ways of getting waste diverted from disposal, there are still only two disposal options. I think it's important to note that an alternative to energy from waste can only be landfill at the present time with the technologies that we have. With the New South Wales Government's energy from waste policy and the new infrastructure plan, it's quite ambiguous and unclear if landfills are being banned and there's going to be a mandated transition to energy from waste. We think that uncertainty is going to create problems for infrastructure development going forwards.

If there is a landfill ban, then clearly we're transitioning to energy from waste. But if there's not, is landfill going to compete in an open market with energy from waste? And will landfill development be a bit more freed in terms of planning pathways and regulatory pathways? We don't believe there has been any proper analysis of landfill versus energy from waste financially or from a cost-benefit analysis perspective. At Hornsby we're quite concerned as to what energy-from-waste facilities that may cost anywhere from \$1 billion to \$1½ billion may do to our cost profiles for providing waste services to our community. If major landfills can be developed for \$100 million versus \$1 billion for an energy-from-waste facility, we think that it's highly likely that the cost structure of moving to energy from waste is going to impact what our ratepayers have to pay for waste disposal.

There's also that major timing issue on will the infrastructure be ready in time to ensure a continuity of disposal capacity for a major metropolitan city? Whether it's energy from waste or landfill, the City of Sydney, being five million people, requires an integrated waste infrastructure network of receiving transfer stations, bulking facilities, rail head lines and then access out to those facilities. At present, there's no infrastructure plan that sets out that type of integrated waste infrastructure network for our city, and there's no real agency responsible, not just for the strategic planning of that but for facilitating the delivery of such infrastructure. Back in 1999 or 2000, there was a waste crisis in North Sydney similar to what we're experiencing now, for the same reasons: the lack of strategic planning and a lack of infrastructure delivery. Woodlawn landfill was born out of that crisis from government intervention. In trying to solve that crisis, we've really come full circle back on that point from 25 years ago. Thank you.

VANESSA PARKES: Blacktown City Council began assessing energy-from-waste facilities in 2013 when a development application was lodged for a facility in Eastern Creek. We do not oppose energy from waste in principle. Our position is that energy from waste can only be supported where there is clear evidence that it protects human health and the environment, backed by strong, transparent, enforceable regulation. The evidence before this inquiry shows increasing pressure on New South Wales residual waste capacity, but it also shows that public trust remains the limiting factor. Our submission focuses on rebuilding that trust. Protecting human health and the environment is our highest priority.

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Meeting minimum regulatory standards is not enough. We are calling for the use of international best practice technology, with mandatory upgrades as technology improves, and independent health risk assessments led by NSW Health, reflecting Australian conditions, cumulative exposure and local airshed characteristics. These are not optional extras; they are baselines for community confidence. Transparency is equally critical. Communities will not accept a "trust us" as a regulatory model. We are seeking 12 months of baseline air quality monitoring before any facility opens; continuous emissions monitoring once operational; real-time public access to emissions data; and a dedicated New South Wales EPA regulatory officer, with licence conditions finalised before—not after—development consent. These measures shift the system from reassurance to verifiable accountability.

We are also clear that energy from waste must sit at the bottom of the waste hierarchy, dealing only with genuinely residual waste. Poorly regulated energy from waste risks locking councils into long-term supply contracts, undermining recycling markets and weakening incentives for waste avoidance. Safeguards such as pre-treatment regulations, limits on incineration volumes, strict control on eligible waste streams and mandatory technology upgrades are essential to prevent these outcomes. Community acceptance is decisive; at the local level we see opposition driven by health concerns, lack of transparency and a sense that local communities bear the impacts while the benefits flow elsewhere. To address this, we emphasise the need for community liaison groups, open and ongoing engagement, and genuine transparency.

We also acknowledge that host communities may reasonably expect tangible local benefits to offset impacts such as traffic, amenity and infrastructure use. Our position is not opposition for its own sake; it is conditional, cautious and grounded in our responsibility to protect our community. Our message to the Committee is simple. Energy from waste may form part of the solution, but only if it is safe, transparent, rigorously regulated and genuinely supported by the community. Anything less risks undermining public confidence and long-term environmental outcomes.

The CHAIR: You raised some really interesting points in your submissions, particularly from the historic perspective of each of you having, respectively, referenced Woodlawn and Eastern Creek. You're coming from a position of some knowledge around previous proposals and what we're looking at now. One of the things that I find really interesting from you both in different ways is that, Mr Horsey, you're saying that there needs to be some form of responsible agency put in place and, Ms Parkes, you're talking about community consultation groups as such. Neither of those things are going on. If we're concerned about the capacity being reached by 2030, as we continue to be told, we need time in order to implement measures such as you suggested. What are both of your thoughts on—as an interim measure, at the very least—expanding landfill capacity to deal with what needs to be dealt with while these things are occurring?

CHRIS HORSEY: I think that's right, and I think that's been identified in the waste infrastructure plan. If 2030 is when we run out of capacity, then we need an interim solution to get us across that gap. What's not clear, though—I've managed landfills in the past and, when I've managed them, I've known how much capacity I've got left, how much is going in, and I know when that expires. I then look backwards and I say, "Okay, what's my planning for building a new cell or a new site?" I know how long that takes and all my phases. There's no agency responsible for that in New South Wales. No-one is really doing that. The EPA's waste infrastructure plan is quite high level and is devoid of sufficient details to do that pragmatic, on-the-ground work.

What we still don't know is—the interim capacity, I believe, is directed at Lucas Heights and extending there. How long does that get? There's still some virgin ground there that Cleanaway can develop. How long will that get? But that's only going to suit those councils that have contractual arrangements with Cleanaway going to that site. Hornsby doesn't. We're with Veolia, the only other major disposal avenue, and we go down to Woodlawn via the Auburn transfer station. We're unclear as to how much disposal capacity they have left and what happens at the end of our contract there. That interim capacity is nothing but a stopgap measure for crisis measures only.

What's still not happening above that is the proper strategic planning of where that is, and this confusion around landfills being banned into the future. The infrastructure plan says new landfills "as a last resort". We perceive that to be a signal to the market saying, "We're not going to approve any new landfills." So if we're transitioning to energy from waste, what's the time frame on those? We know where the proposals are for Woodlawn and the Parkes site, but we don't know what the time frames on those are. We don't know what that's going to cost us to access those. There's just this great deal of uncertainty that still exists.

VANESSA PARKES: I would agree with the comments made by Mr Horsey. The only thing that I could add is that waste really needs to be considered—waste disposal and waste collection—like an essential service, and the priority given to exactly what you were saying, for the uncertainty that we have in disposing of our waste.

The CHAIR: What's the position of the councils on seeing the restrictions on the current four locations, as specified, lifted in order for some of this analysis and research to take place?

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CHRIS HORSEY: We'd be very supportive of that. In fact, in our submission we've pointed out that closing or closed coal-fired power stations are ideal energy from waste locations. There are some of those on the Central Coast, in the Hunter and at Lithgow as well. They have the right infrastructure. They have rail lines. They're connected to the grid. They seem quite fit for purpose. Then it just comes back to an air quality issue, and I think the biggest issue there is that—I think it was the chief scientist who had come out and said that energy from waste facilities were not appropriate for Sydney Basin air quality. Therefore, they have to go outside, and I think that's been the driving force for those four locations. Perhaps there needs to be a review of those four locations to free up other alternatives and let those alternatives compete on their own merit under the planning system.

LUKE COOK: We would be supportive of those comments, again. Following on from what Mr Horsey was saying, any new or proposed locations—just supporting that with the investigations and studies to support that it's safe for that community and for that environment. As long as it's backed by those studies then, yes, we'd be supportive of that.

The CHAIR: On what you're discussing there in terms of emissions and the broader potential health implications, are you aware of the proposed volumes of the residue from the incineration process that will actually have to be brought back to Sydney, Kemps Creek, in terms of tonnage from the waste that goes out and then what has to come back—the travel of that hazardous waste material? Are you aware of that?

CHRIS HORSEY: Yes, most certainly. I think it's around 30 per cent, from memory. I'm not across the science of what is in that, but I know it's classed as a hazardous waste. Therefore, it can't go to a class 2 landfill or a class 1 landfill. It has to go to a hazardous waste landfill, which is considerably more expensive and requires a lot more treatment and so forth. So, yes, most definitely.

LUKE COOK: I probably haven't been across what's coming back as much as Mr Horsey is but, yes, we'd be supportive of that. If the hazardous waste material is coming through, then we have to appropriately manage that and be careful of what is coming back. We're considering that we're reducing landfill capacity, but also what's coming back is definitely a consideration that we'll have to bring forward.

Dr AMANDA COHN: My first question is to Blacktown. In your written submission, you've made a recommendation around payment of host fees offsetting community concerns by funding local community improvements. You mentioned that you had a former arrangement with the Eastern Creek resource recovery facility. Could you provide us some more information about that agreement and what it entails?

VANESSA PARKES: I could probably start, and I don't know if you can add any more, Luke. Thank you. That came about from when we went to see some facilities overseas. I can't remember the name—sorry—of the particular town, but it was a host fee that allowed for improvements to happen to the town or the city where it's going to. It's quite a sizeable contribution so that they're not just taking the bad bits, and there's something good that comes back to the community if they are to take on an energy-from-waste facility. For example, it could fund parks, schools and recycling resource centres et cetera.

LUKE COOK: I'll just jump on the end of that. From the local government level, I guess we sense from the community that they feel like they're receiving the impacts while not receiving the benefits of these facilities. Sort of what Vanessa was saying—even just, when these facilities are operational, having an ability for residents to enter the site and understand the science and what's going on in these facilities so that they can have an understanding and be confident in what's happening and what's happening around them.

Dr AMANDA COHN: Specifically for the Eastern Creek proposal, was that arrangement entered into directly between the proponent and the council, or how was that organised?

VANESSA PARKES: It didn't get that far, because the DA was withdrawn.

Dr AMANDA COHN: I have another question to both of you. The local government sector has been campaigning for many years now for the waste levy to be returned to councils. The regional communities where these incinerators are proposed have been asking the Committee to look at what is the most ambition possible in Sydney to reduce residual waste. What do you see as the opportunities? Were the State Government to return the waste levy to the local government sector for waste processing, what might be opportunities in your local government areas? How could that funding be used to reduce residual waste?

CHRIS HORSEY: I think we've addressed this in previous submissions. I can't recall the detail I put in the energy-from-waste submission but certainly in the infrastructure one, which is an attachment, it has been addressed. Hornsby pays around \$6 million in waste levy funding a year. What we've often advocated for is that, to facilitate better waste infrastructure development, we would like to see an exemption process put in place whereby if we are developing or involved in the development of waste infrastructure, the money that's going into

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that infrastructure development effectively gets exempted from those waste levy payments. That's a way of then channelling those funds, at the moment the majority of which go to consolidated revenue, back into the purposes for which they're being levied in the first place. It's quite a direct mechanism, and there's a very direct link in that mechanism to waste infrastructure development. It quite pragmatically gets the infrastructure happening on the ground.

STEVE FEDOROW: If I can just extend on that, the challenge at present is that, with the levy being paid and then going into government, any money that's returned is via grant programs, and they're defined and set. It's a much more direct connection where funds that would otherwise be levied in the local area can go to actually service appropriate facilities or processes.

VANESSA PARKES: I would agree with both the comments that were made, just reinforcing that it would be good to see that the money from the waste levy is invested in waste infrastructure.

The Hon. MARK BANASIAK: Ms Parkes, you spoke in your opening statement a lot around conditional support for these facilities, as long as the safety is up to scratch and the regulatory is up to scratch. Currently, as it stands, do you have trust in the EPA as the regulatory agency that they have the required skills, tools and powers to regulate energy-from-waste facilities to that standard that you want to see?

VANESSA PARKES: Yes, but I think we can do a lot better. I think that there need to be dedicated resources to energy from waste. One of the concerns that I mentioned is that, most of the time, when the DA is actually approved, then an EPA officer will be assigned to put the conditions on it. It all needs to be consolidated as part of the process from the get-go. I think that there's certainly the knowledge and the skills, but it's just the dedication to making this as important as it is.

The Hon. MARK BANASIAK: Would you like to see a dedicated team within the EPA where their sole job is to manage energy-from-waste facilities?

VANESSA PARKES: And to look into it, yes.

The Hon. MARK BANASIAK: Can I just talk about the relationship with councils and contracts with these facilities. Obviously, these facilities need to be fed; they're insatiable beasts. You need to feed them to keep them going. Are we locking councils into potentially tight contracts where they're almost discouraged from recycling and coming up with other ways to reduce their waste and just funnelling more towards these facilities to feed them? It's an open question to you both.

STEVE FEDOROW: As local councils, we're aligned with our communities, which are very focused on recycling and resource diversion. That being said, though, the contracts for that end point—the disposal, the last point—would need to be long-term contracts. And that's how the market operates—they want decades of contracts. So if there were newer initiatives or technologies in place, that poses some of those challenges over time.

CHRIS HORSEY: If I may, I think one of the nuances in your question is around inhibiting recycling and resource recovery. When we write these contracts, we don't actually specify volumes and we cannot give a guarantee of volumes to a contractor. Our community's waste generation varies constantly. What we say is we will bring you what waste we collect in the red bin or our bulky waste. They're the two streams that get disposed of. In no way does that inhibit us, and we have clauses in our contracts that free council to pursue whatever resource recovery and recycling initiatives we see fit. If that then results in decreased volumes going to disposal then that's permissible under those contracts. So modern waste disposal contracts do address those issues and, for us, that's not really a risk of stymieing further resource recovery.

LUKE COOK: I'll just add on to that. We did mention in our submission that if these facilities are poorly regulated, that does bring concerns that it can lock councils into long-term waste contracts, which I'll probably expand on here, but it probably refers a bit back to your previous question to Ms Parkes. With the EPA oversight, I find working with them at the moment—obviously not for energy-from-waste facilities, but for different matters, they're quite responsive in the regulation of concerns. But I think our goal—and it's probably a goal amongst the board here—is that we want to avoid the concerns occurring in the first place. That's why we think their involvement from the start and implementing the tools that they have available is just really important.

STEVE FEDOROW: If I may, a point that our colleagues at Blacktown have made in the initial statement which I think is important is the licensing and the standards that are applied. Our experience has been in water treatment. For a Sydney Water example, the licence conditions that are set and the standards of outputs often aren't updated according to new technology. We have examples where treatment facilities are achieving much more stringent outputs than what the licences are. When we put submissions into licences, the licences aren't updated to reflect a ratchet. So, effectively, as better technology applies, that's the minimum standard, not when it was first

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put into place. We would suggest in any of these things that that should be a key component too. So as improvements are made, those investments are made, and that becomes the floor, rather than what was historically the case.

VANESSA PARKES: Just a quick further comment: I think that we can learn very much from Europe about what they're doing with their facilities over there. We did observe that the content that was being incinerated was potentially stuff that could be recycled—for example, the dense plastics et cetera. Because of the high calorific value that fuels the incinerator, they're needed. So there is very much that direct concern that it will impact the waste hierarchy.

The Hon. ROD ROBERTS: Thank you very much, both councils, for your attendance today. Your submissions are quite detailed and leave very few questions, because your positions are quite well stated here. Mr Horsey, if I can take you to yours in particular around the cost concerns of energy from waste versus landfill. Has anybody at all done any studies or projected to Hornsby council specifically—and that's your area of expertise—what the cost will be to you as a council of changing from landfill to an energy-from-waste project?

CHRIS HORSEY: No, not to our knowledge—not directly to Hornsby council, nor are we aware of any others being done in the industry or by the regulator or any agency in the State government. The comments and opinion in the submission are purely based on looking at known costs around building landfills. For a mega landfill, rather than more of a single-council landfill, one that might service 20 or 30 local councils in Sydney, you're talking \$100 million to \$200 million to develop at scale. Whereas I think the Veolia-proposed energy-from-waste facility is quoted around \$600 million. That's probably an old price, noting that construction costs have significantly increased in the last two to three years. I think the Western Australian plant that was built actually went over \$1 billion, but I have no direct knowledge. Looking at those price ranges, if you're building a disposal facility 100 to 200 versus something that's going to cost you a quarter of a billion to 1½ billion, one would have to assume that that facility needs to be paid for and get its return on investment and get its opex paid for. Therefore, it's an assumption that that is going to come at a significant cost, but we just don't know, and it's that uncertainty that concerns us.

The Hon. ROD ROBERTS: And it's a fair assumption too. The proponents of, say, Tarago and Parkes are profit companies. They are companies, and companies are designed to make a profit. We all understand that. The profit has to be paid for by somebody, and that will be the end user, and one would assume the ratepayers of Hornsby and Blacktown, for example. Added to that is that transportation costs are taken up over the Great Divide if you're heading towards Parkes, which is unknown at this stage. Nobody has spoken to you about that. It would be a safe assumption then, based on your submission, that there's going to be a significant cost burden to old mum and dad at the end of the day, which will be tacked on to their rates. Would that be a fair proposition?

CHRIS HORSEY: Indeed, and that has been happening. In the last decade, Hornsby's domestic waste management charge, which is what the residents pay for their waste services, has doubled. We're quite concerned—and we have some forward cost estimates—that that is soon going to exceed the general rate for waste disposal. You've rightly hit on distance as being a major contributor. Waste is a transport logistics game. The further away the facilities are, the more it's going to cost us. But there are other factors in that from a strategic infrastructure perspective, having transfer stations, railheads, the way we move waste, where we're moving it to, networks of facilities that suit a city so that they're integrated. We have 35-odd trucks running around our shire. If they have to travel to the other side of Sydney to drop their waste off, that's adding extra cost burden. All of these extra components add up in the system of waste management.

But from a technology perspective, energy from waste appears to be a much more costly technology to develop versus landfills. Having said that, we've also made submissions to the New South Wales landfill guidelines review that's underway at the moment, recommending that perhaps the landfill gas extraction requirements in those landfill guidelines should be beefed up and that there be more specifications around the gas extraction systems to get better methane gas extraction and conversion to electricity, and that perhaps biocapping with mature compost over landfills can address any fugitive emission concerns of those landfills so that if they only capture 50 to 60 per cent of the landfill gas, the other 40 to 50 per cent is becoming fugitive emissions. If you cap those landfills with an organic, one-metre thick cover, that methane is converted to carbon dioxide before it gets out, and it will then also make quite a viable market for low-grade organic composts. There are things that can be done to address the impact of landfills as well.

The Hon. ROD ROBERTS: Ms Parkes or Mr Cook, do you want to chime in on the cost burden to your council and your own ratepayers?

VANESSA PARKES: I think Mr Horsey summed it up very well.

The Hon. ROD ROBERTS: I thought he had, but I wanted to be fair and give you the opportunity to—

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VANESSA PARKES: Nothing further from me.

The Hon. ROD ROBERTS: This is my reading, Mr Horsey, so I'm looking whether my interpretation is correct. You say:

If the NSW Government is not banning future landfill development, it is suggested that landfills and EfW technology be allowed to compete in the open market for Sydney's disposal capacity to assist keep disposal costs in check—

which is what we just talked about—

with improved market competition.

Would I be fair in drawing the conclusion then that if there was a viable landfill development, as you suggest, on scale shared by other councils, and it was cheaper than an energy-from-waste project out in the regions, would Hornsby council be open to using the landfill if it was a cheaper alternative?

STEVE FEDOROW: I might start and then defer to Chris. Like all councils, any procurement needs to go through an open market tender process, so that would be the first approach we would come to. We obviously get to draft the specifications of the tender. Currently we go to landfill. As Hornsby council, we're contracted at landfill, and it would be a decision that would be ultimately made by the council in terms of the form of that tender and what it was seeking to procure. As it stands, the only viable option at the moment is landfill.

CHRIS HORSEY: Can I just quickly respond to that? I'd add to that that we are technology agnostic at Hornsby.

The Hon. ROD ROBERTS: Yes, of course.

CHRIS HORSEY: The tender processes will often decide—and in those tender processes, not only do we evaluate price, but we evaluate a range of environmental and sustainability factors, social factors, economic et cetera. That process will determine that outcome. If a landfill is cheaper and there are no huge environmental disbenefits to that, the processors decide under the criteria.

The Hon. ROD ROBERTS: With no disrespect to Mr Fedorow, I think you've grasped my question much better, and that is you are agnostic—Hornsby council is not against landfill per se, full stop.

CHRIS HORSEY: No.

The Hon. ROD ROBERTS: Blacktown isn't either—Ms Parkes, are you shaking your head?

VANESSA PARKES: That's correct. No, we're not. That's where our waste currently goes.

The Hon. EMILY SUVAAL: Where do Blacktown and Hornsby councils currently send their waste?

STEVE FEDOROW: Hornsby council sends its residual waste to the Woodlawn landfill.

The Hon. EMILY SUVAAL: So Goulburn.

STEVE FEDOROW: Yes.

VANESSA PARKES: Ours goes to Lucas Heights.

The Hon. EMILY SUVAAL: Would either of your councils be willing to host a landfill or energy-from-waste facility?

STEVE FEDOROW: It's a very difficult question in that we don't believe we actually have the land space. Within Sydney itself, the capacity and the spaces available to actually develop a facility such as this, I think, are very capped and very limited.

VANESSA PARKES: We've had many, but the space is drying up. We've had it at Eastern Creek, and we've had smaller ones around the city, but it's whether there's the land available. Again, it needs to not have the impact on the community as well.

The Hon. EMILY SUVAAL: Given the constraints within your local councils that you face in terms of perhaps not being able to host additional landfill or energy-from-waste facilities to support the waste needs of your constituents, what steps has Hornsby or Blacktown taken to reduce the amount going over the tip face, for want of a better description? Have you reduced your red bin sizes? Have you rolled out FOGO?

VANESSA PARKES: If I may start this time, we've just introduced a FOGO service in Blacktown. Prior to that, it was just the red and the yellow recycling bin. We now have a food and organic bin, which has been very well received, but as part of that we did reduce the red bin size. There has been a lot of pushback from the community for that, and we've got a number of different scenarios that suit different households. But we're collecting the FOGO bin weekly, the red bin—the residual waste—weekly, and fortnightly for recycling.

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The Hon. EMILY SUVAAL: Remind me—Blacktown council historically has not had a green bin either?

VANESSA PARKES: We didn't, but—sorry, our red bin went to the what was the UR-3R facility at Eastern Creek. Prior to there being a restriction on the compost that came out of that, it was all processed there. It was supposed to be turned back into compost because of the high plastics et cetera. There was a ban placed on that; I've forgotten the name of the ban off the top of my head.

CHRIS HORSEY: MWOO.

VANESSA PARKES: MWOO, that's right. It meant that, effectively, we were sending our waste to that facility and it was drying it out, and then we're sending it to landfill. It would reduce some of the weight in the red bin, but now it's a dedicated FOGO bin.

CHRIS HORSEY: From Hornsby's perspective, we have a comprehensive waste matters strategy. I think where I'd like to start is it has been quite clear that we have no current viable pathway to achieve the Federal or State government targets. We've got lots of diverse things in our strategy, from car boot sales to clothing swaps to second-hand markets. I could rattle through all those. Waste infrastructure and processing typically is the only thing that moves the needle. A lot of those other programs I mentioned are great to have and are essential to get various things, but they don't move the needle in terms of our tonnages.

We're sitting at about 48½ per cent resource recovery in Hornsby. We are in the middle of tendering for a fourth bin for food-only collections. We've had a green waste bin for some time. We have under 1 per cent contamination in that green waste. We make superb compost out of that material and we don't want to jeopardise that, hence the fourth bin decision. That is not going to get us any more than around 3 per cent resource recovery, implementing that food recycling program, on tonnages. We will come up above that 50 per cent. How we get to 80 per cent, it's not clear. I've been a waste professional for 29 years and I can't find anyone that can tell me how we're going to do that, whether it's an invention of a new technology or whether there's going to be some sort of European directives around what can be disposed of and some heavier regulations or something. I don't know.

It's quite difficult, as a waste professional, having to admit that you don't know how you're going to get to a particular target because you just can't identify a viable pathway. I think that's quite worth noting, particularly around—we are reliant on disposal facilities for around 50 per cent, and I don't see that changing any time soon. We are very fixated on our economy, and the more we do around economic measures, the more waste we create. Waste generation is constantly increasing. For recycling to bite and reduce waste to landfill, you have to get that resource recovery rate to outstrip the generation rate, and we're just not doing that. We're sort of sliding backwards at the moment.

The Hon. EMILY SUVAAL: But you can understand why not having FOGO in a council area for so long—we've got places like Penrith that have had it for decades now. Not having councils having rolled out FOGO has actually played a significant contributing factor to us being in the situation that we're in.

CHRIS HORSEY: Indeed, yes.

The Hon. EMILY SUVAAL: Both of your submissions acknowledge the predicament that we're in around waste and the fact that we're going to run out of landfill. What steps have your councils both put in place for a scenario where, God forbid, there is literally nowhere for our red bins to go?

CHRIS HORSEY: I'm limited in what I can say. We're talking and engaging with our current service provider around what we may do at the end of that contract and what their capacity is. We do also have other measures in place. We have arrangements with the Central Coast, who are our neighbouring council, who own and operate a landfill, so there's an option there. We are also aware that Summerhill landfill in Newcastle is quite open commercially to accepting waste out of Sydney. There are some options there so that we—

The Hon. EMILY SUVAAL: It's fair to say, though, that it's a real concern that you have.

CHRIS HORSEY: A very serious concern, yes.

STEVE FEDOROW: It is, and the examples that Chris gave came into effect when we had the extreme wet weather in '21 and '22 and the rail line, in Hornsby's case, down to Woodlawn was blocked for a period of time. We were in this forced situation of what we do with waste. In that scenario we were fortunate, being on the north of Sydney, that our neighbouring council Central Coast was able to assist. But it was a wider issue across Sydney.

VANESSA PARKES: The only other thing I could add is it's really important that we're leaders, in local government too, in the circular economy and, in fact, in buying back the recycled product as well. That's really important, just to create the markets et cetera. That's where we're working a lot in that space. It's all good to recycle and to do all of this great stuff, but if there's no market for it in return then it is a big issue.

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The CHAIR: I have one final quick point for both of you, because our time is up. In talking about all of that, the social licence and accepting and understanding is a critical part of whatever is rolled out.

STEVE FEDOROW: Yes.

VANESSA PARKES: Absolutely, yes.

LUKE COOK: Yes.

CHRIS HORSEY: Yes.

The CHAIR: Thank you all for your time today and your evidence. I don't think you've taken anything on notice but, if there's anything further, we may have questions that we'll provide following today's outcomes. We'll get those to you and look forward to hearing more really interesting information. We appreciate it very much.

(The witnesses withdrew.)

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Mr TIM ASKEW, Director of Programs, Hunter Joint Organisation, affirmed and examined

Mr CHRIS DART, Program Lead, Waste and Circular Economy, Hunter Joint Organisation, affirmed and examined

The Hon. EMILY SUVAAL: Chair, for the next panel of witnesses, I declare that I'm a ratepayer in Cessnock City Council.

The CHAIR: Thank you to both witnesses for being here and for giving us your time today to give evidence. Would either or both of you like to begin by making a short statement?

CHRIS DART: Sure. I just wanted to open by giving a little bit of context as to who we are, who our organisation is and how we formed our view that we reflected in our submission. The Hunter JO, or the Hunter Joint Organisation, is a statutory body under the Local Government Act established to facilitate intergovernmental collaboration, regional strategic planning and priority setting and advocacy. We also serve as the EPA-funded voluntary waste group. We've got 11 member councils within that waste group who we work with collaboratively on regional waste and resource recovery priorities. Our position on energy from waste has been developed in consultation with that waste group, which is chiefly made up of the waste managers and the waste teams from those member councils. But we haven't undertaken any community consultation or engagement in forming that view. I think that's an important point to make.

As a waste group, we are of the opinion that energy-from-waste facilities can play an important role in a modern waste management system by safely processing some forms of non-recoverable residual waste. But I think it's important to stress that we think that any investment in energy-from-waste facilities needs to be complemented by investment in resource recovery and circular economy infrastructure as well. Large consolidated facilities like those that are being proposed may offer better environmental performance and can extract more energy from waste than landfills can, particularly compared to the current system of quite small, dispersed landfills that we have in our region. Our councils operate 17 active landfills at present.

We support the New South Wales Government's recent efforts to lead statewide infrastructure planning, and we think this type of coordinated approach is needed to facilitate the sophisticated waste infrastructure that we need in the future. However, we also think that the New South Wales Government needs to do more to support its policy objectives by engaging the community in providing honest and trustworthy information about the role of energy from waste. We're of the opinion that that's been lacking so far in this debate. And that is all.

The CHAIR: I take it you're happy with that as well, Mr Askew. From that point that you made there, Mr Dart, you said that there's been no community engagement as such around your development of these things. Yet in your submission you state that there's overall support for the addition of the Tomago site in Port Stephens as a permissible precinct for energy from waste. What is that based on then if it's not community engagement consultation?

CHRIS DART: That's the view of our waste group of the council.

The CHAIR: But that hasn't been put out there more broadly yet to see what sort of social licence there might be around all of that?

CHRIS DART: That's correct.

Dr AMANDA COHN: I had a question arising from your written submission where you noted the cases internationally where the uptake of energy from waste has resulted in falling recycling rates because those facilities, to operate at full capacity, demanded feedstock that could otherwise be recycled. You've pointed out that we would need to invest further in resource recovery processes to make sure that that doesn't happen here. Could you provide some more detail around options your members in the Hunter have explored?

CHRIS DART: Sure. I'll start, Tim, if you like. I think we strongly—we're concerned about that becoming a reality, that an energy-from-waste facility just sucks in waste that could otherwise be recovered. That's not an outcome that we would want to see. As I said, our councils at the moment operate—they all, with the exception of one, operate at least one active landfill. I think, as we move into the future, we're starting to see increasing risks emerge from the operation of those landfills, whether they're environmental compliance risks or cost pressures. Our councils are starting to turn their mind—obviously, always—to what the future infrastructure looks like.

I think there's some interest in setting up a more regionally collaborative system of consolidated larger facilities that are supported by, let's say, transfer infrastructure, aggregation and processing infrastructure, which would give councils a greater ability to extract and aggregate materials for recovery. That's the type of infrastructure that we're looking at. We're moving away from continued investment in smaller landfills and starting

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to look at what other options might exist that would allow our member councils to interact with a larger facility, whether that be a landfill or an energy-from-waste facility or a large recovery infrastructure, by aggregating and doing some pre-treating and some sorting of waste.

Dr AMANDA COHN: It may need to be taken on notice, but I'd be really interested in the detail of what's been considered in terms of those processing—

CHRIS DART: Sure. We've got some EPA funding to develop a regional waste infrastructure strategy, which we've just started to do. We're in the very early stages of that. But I think over the next 12 months or so that'll become a bit more clear and that strategy should be made publicly available.

TIM ASKEW: I'd just like to add that, over the last few years, we've been strongly investing in the circular economy systems in our region and really investigating strategically what that might look like over the longer term. We've been lucky enough to receive EPA funds to investigate all sorts of angles in the circular economy. So I think, through this submission as well, we would see the circular economy as the ultimate solution to the waste issue, to the point where we want to really see our waste as a resource in the longer term. I think what we're saying is energy from waste is an incremental improvement over landfill but not the long-term solution.

Dr AMANDA COHN: If I could just follow up on that, it's terrific that you are approaching this issue as a region with collaboration across the councils. What barriers are there to the implementation of that strategy, or what additional government support would you need?

TIM ASKEW: I would probably need another half an hour to talk through all of those and can possibly provide more information to the Committee post this inquiry. But there are so many barriers to trying to create the circular economy. The main one for us—if we were really, truly going to be successful in this space—is a very strong and committed investment in people resources to develop a focus on the circular economy. Basically what you're saying is you're rewiring the entire economy. That requires collaboration from Federal, State and local governments, as well as the business community, to try to do that. It's not impossible, but it takes a concerted effort with a strong strategy to do that, and some cash.

Dr AMANDA COHN: I could probably spend the rest of your time just talking about this. I will go to my colleagues, but I'd really appreciate further information, with your recommendations, being provided on notice.

The Hon. ROD ROBERTS: Thank you, gentlemen, for your attendance today and for your submission. The Hunter Joint Organisation—these are my words—is an umbrella organisation looking after 11 councils. I note in your written submission that you say the Hunter JO made a submission in relation to the energy from waste options paper back in early 2025 and supported the addition of the Tomago site in Port Stephens. Was that a unanimous decision from your organisation? Did all councils agree to that position or was that a majority decision?

CHRIS DART: That position was formed, again, with our waste group. Broadly, there was support. I don't remember there being any dissenters in that. We did also put that to members of our board, which was made up of the mayors and the general managers, for any opposition. None was raised. However, I would point out that does not mean that we're 100 per cent supportive of an energy-from-waste facility being developed at Tomago. We are merely expressing our support for the gazettal of that site as a permissible location such that it can be considered, subject to environmental assessment and the planning process.

The Hon. ROD ROBERTS: Taking that into account, am I safe in assuming that up until this point—not going any further forward—Port Stephens Council is open to having a facility at Tomago? Is that correct?

CHRIS DART: Yes, that's my understanding. They haven't expressed any opposition to us and have been open to it.

The Hon. ROD ROBERTS: Have you read or listened to other submissions that this inquiry has heard?

CHRIS DART: I have seen and read a few, and read some transcripts, yes.

The Hon. ROD ROBERTS: That draws me to the previous witnesses, particularly the people from Hornsby council, who suggested in their submission exploring the possibility of using disused open-cut mines in the Hunter as possible landfill alternatives. Has that been explored in amongst the Hunter Joint Organisation?

CHRIS DART: I've certainly heard it talked about. I don't think we've ever seriously investigated that possibility. Tim, correct me if I'm wrong, but I would point out that generally our member councils are quite interested in the adaptive re-use of mine sites. For what purpose, I couldn't say.

The CHAIR: Could I just quickly ask, on the back of Mr Roberts there, on the Tomago question and that being put forward, how was the possibility for Tomago to be on that list advanced to the JO?

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CHRIS DART: I don't think we were directly approached. I believe we found out through the EPA's public exhibition of the draft framework.

The CHAIR: It's not as though it was taken to you or to the council; it essentially appeared on the EPA's website and then you've had the discussions subsequently about that. You haven't been provided any information on what or how or—

CHRIS DART: No, not really. Nothing other than what has been publicly available, with the exception that we have seen some draft maps for the outline of that proposed precinct.

TIM ASKEW: I'd also add that we've got some strong caveats around our submission around social licence and proper assessment of the environmental impacts of energy from waste. Our support is subject to those things being led by the State Government.

The CHAIR: In saying that as well, and coming back to the social licence and the point that Dr Cohn was making about resource recovery, that obviously you feel needs to be a priority, you also note in your submission that EFW facilities operate most efficiently when at full capacity. That and the idea that contracts need to be locked in for periods of 25 to 30 years—that's the life span of such facilities—do you feel that could potentially preclude this movement towards the circular economy and better resource recovery?

CHRIS DART: I think certainly there's a risk that that could happen. I'm certainly not the expert on it but I would like to see, as I said before, any investment in energy-from-waste infrastructure complemented by investment in resource recovery infrastructure. I'm not sure exactly how this would be achieved, but whether there are some—I think there needs to be some very clear guidance or restrictions on what can be accepted into those facilities. I wouldn't want to see them, as I think someone else alluded to earlier, just feeding the beast with any type of waste. I think we need to be really careful about what type of waste is appropriate for that and what can be feasibly recovered. The two shouldn't necessarily be mixed. It should only be for non-recoverable residual wastes.

The CHAIR: And the waste levy, should that be, even in part, directed to better investment in terms of resource recovery and opportunities for R&D?

TIM ASKEW: I can answer that. We have a strong position on the waste levy that we would like to see it 100 per cent hypothecated for use of solving these critical issues that we have around waste management. At the moment, we haven't been successful in getting 100 per cent hypothecation, but our current position is if at least we could return to a 9 per cent recovery of our waste levy back into the region to reinvest in our resource recovery infrastructure, we could get a much better outcome for our region.

The CHAIR: Just a mere 9 per cent, Mr Askew?

TIM ASKEW: I know. That was our submission recently to the New South Wales budget, because we used to get 9 per cent of our waste levy back in about 2010-2011. That would be a good start.

The Hon. MARK BANASIAK: Just picking up on your comments around social licence and the Chair's questions there, your submission sort of highlights a trust in State-led infrastructure. Do you think these energy-from-waste facilities face that same trust deficit, going forward? Have you been observing the consultation and the proposals in Parkes and Tarago? How do you see them sitting in that distrust paradigm?

CHRIS DART: Yes, I have been following the proposed facilities. To me, I think that the lack of there being a trusted body providing impartial, reliable, honest information to the community has led to a situation where there is a huge amount of information coming from other sources. Some of it is, I think, reliable, and some of it isn't. But it's very difficult to decipher what is and what isn't true. I think that creates a situation where members of the public are confused or unsure. I mean, I read a lot about it, and I'm confused and unsure at times, because I find it difficult to find information that I can really rely on. As we've pointed out in our submission, I think it's ineffective to leave all of the consultation to the proponents of these facilities.

I think inherently there is some scepticism in what the proponents may be saying to the community, because they have a vested interest in the facility going ahead. I understand that the State Government needs to be a bit mindful of conflict of interest when they're also the assessment authority for these developments, but I think that more consultation and community engagement could be done to support the policies of the State Government that are enabling or encouraging these facilities. For example, the framework—just explaining what the role of energy from waste is, what the risks are, how those risks can be mitigated, examples of successful developments overseas, or whatever it may be. I think that a body like the State Government, given the controversial nature of this issue, needs to lead that debate or at least moderate it so that there is information that can be trusted in the public domain.

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The Hon. MARK BANASIAK: Do you think the EPA can be that trusted source, or has that horse bolted, given their poor performance in Tarago and other sites?

CHRIS DART: Whether they're the appropriate agency might not be a decision for me, but I think they could play that role, if that was appropriate. Maybe there's another government body that would be better placed to do it, but I think the EPA is more than capable of doing it. I think it would be great for them to step into that role and provide more information.

The Hon. NATASHA MACLAREN-JONES: Following on from that, specifically around consultation as opposed to providing trusted information, what role do you see individual councils or joint orgs having in driving that? Also, what is the minimum amount of consultation that's required?

TIM ASKEW: I think it's a difficult question to answer for us, but I would say that we would want to be a partner in assisting the State Government in community consultation. Other than that, I don't think I can add anything to that.

CHRIS DART: I think the councils do do a lot of engagement about their waste services on an ongoing basis, so if we got to a point in time—whatever their decisions are around how waste is processed or collected or recovered, the councils have got a very strong track record of doing that. They'd be able to support community engagement, certainly around the services that they provide to their community.

The Hon. EMILY SUVAAL: Thank you for appearing today. The first question I have is around your member councils. You may or may not be able to answer this, but please feel free to take it on notice. To your knowledge, how many of them have rolled out FOGO in their LGAs?

CHRIS DART: Sorry, I'll just have to do some quick maths.

TIM ASKEW: Six.

CHRIS DART: Six?

TIM ASKEW: Yes. We'd probably have to take it on notice to get exact numbers, but there's three or four coming in the next few years. They have a date on that, but I couldn't definitively say which date it is.

The Hon. EMILY SUVAAL: So six of the—

TIM ASKEW: Ten have—

CHRIS DART: Current services, yes. I think two are either running a tender or have a tender recently closed. There's a facility being developed, too, on the mid coast.

TIM ASKEW: But we can provide those accurately.

The Hon. EMILY SUVAAL: Sorry, is it a facility being developed for the processing of the—

CHRIS DART: That's right, yes.

The Hon. EMILY SUVAAL: Is that within the Hunter?

CHRIS DART: Yes. MidCoast Council is one of our member councils.

The Hon. EMILY SUVAAL: In terms of your submission, you mentioned you've got 17 active landfills at the moment across the Hunter JO. Is that correct?

CHRIS DART: Yes, that's to the best of my knowledge. I'll double-check that for you, though.

The Hon. EMILY SUVAAL: Your submission notes that a facility of a comparable size as the ones that have been proposed in the Woodlawn and Parkes facilities would have the ability to basically replace all of those landfills. Is that correct?

CHRIS DART: Yes, that's a preliminary comment.

The Hon. EMILY SUVAAL: It's a "back of the envelope".

CHRIS DART: Exactly, yes.

The Hon. EMILY SUVAAL: In terms of those landfills, I'm interested in exploring a bit more what they're currently like, whether you know how much life they have left in them and how old they are. I know some of the older landfills within New South Wales are particularly gassy and problematic. There was a suggestion earlier today that perhaps we need to lift the requirements for emissions from landfills. Is that something that your councils would then struggle to meet as an additional impost?

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CHRIS DART: Generally, if you look at the facilities across our region, there is a diversity in their—I would say—sophistication, quality and age. Some of the bigger facilities are very sophisticated and have a lot of infrastructure. Others are the opposite. They're very small rural landfills that were developed before the modern guidelines were in place. They are outdated, frankly. I think that makes them at times challenging to manage in terms of the environmental risks. It also makes it difficult to capture gas effectively from those landfills.

I guess another point is that the size or the scale of some of those landfills is quite small and that affects the business case for landfill gas capture in the absence of any kind of other funding support or a mechanism like the ACCU scheme that would provide some credits. Even then, I think the feasibility for gas capture on some of those landfills would be tenuous. I think that was part of the interest in energy from waste facilities, that it potentially is an opportunity to modernise the waste infrastructure in the region and consolidate it into one site where the controls are a bit easier to manage.

The Hon. EMILY SUVAAL: I found it interesting that your submission notes that energy from waste would be less harmful than the current status quo, if you like. Is that why you're suggesting that?

CHRIS DART: Yes. That's our view on it. I would obviously note that we're not experts in that and that's just from the information that we were able to gather. It seemed to us that energy from waste offered some environmental benefits in the sense that it's much more geographically confined. It would be a very sophisticated facility and therefore the environmental controls presumably would be very strong. That would offer some benefits over the current system of waste facilities that we have in the region where the ability to manage the impacts is difficult. However, we do absolutely acknowledge that there is concern about the environmental health and the human health risks around energy from waste and, while to me it seems like the standards that have been adopted in New South Wales are very stringent and that those facilities operate safely around the world, I think that needs to be verified by someone with more expertise than me.

The Hon. EMILY SUVAAL: And that's noted in your submission, that any proposed energy from waste facilities must be subject to those rigorous risk assessments prior to their approval.

CHRIS DART: Absolutely.

The Hon. EMILY SUVAAL: It's fair to say that the Hunter region, as a whole, is no stranger to having to embrace change, new and emerging technologies, but also lifting the weight of the State in some ways. Do you see waste and energy from waste facilities as just another iteration of that for the Hunter area, that it is a new and modern technology that perhaps is needed and will help to supplement our State in terms of some of the issues that we're facing?

CHRIS DART: Yes, but I would expand on that and say that we've been advocating for quite some time now about circular economy as an economic opportunity for the Hunter. It's not just waste processing and energy from waste. I think that there may be an opportunity more broadly to establish industrial circular economy processes in the Hunter and that has the potential to replace some of the economic output that may be lost from the coal industry if that declines over the coming decades. Yes, I agree with you and I think that was part of our point. The Hunter has a tolerance and an acceptance of industrial activities. It's got a strong industrial history. It doesn't mean that they would be tolerant of an unsafe facility; I just mean that there is a history there of that kind of activity.

The Hon. EMILY SUVAAL: The Hunter JO member councils are broadly supportive of energy from waste as a means of replacing landfill, which is sort of noted in your submission. It was a question I put to the previous witnesses—obviously we know that the landfill capacity within New South Wales is quite constrained; we are projected to run out of landfill, as it currently stands, by 2030. What work have your member councils done, or you as a JO, to mitigate against the worst-case scenario, which is that literally people's red bins cannot be picked up from the side of the road?

CHRIS DART: As I noted earlier, all of our councils barring one operate active landfills—some of them more than one. They're quite used to that operational work, which is distinct from metropolitan Sydney where a lot of that is outsourced to the private sector. Providing reliable services to community is the number one priority in terms of waste, so they typically have continued to invest in landfill infrastructure to make sure that there's sufficient capacity. There are examples of where councils are not able to do that. Maitland City Council is getting close to the end of its life for its facility, so it will need to look at other options outside. But typically it's been to operate your own landfill, and therefore that gives an element of security.

The Hon. EMILY SUVAAL: Would you say councils are relatively—and I use this as loosely as I can—a trusted partner when it comes to waste locally, by the local communities in the Hunter?

CHRIS DART: Yes.

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The Hon. EMILY SUVAAL: When you look at some of these issues and concerns around social licence and new and emerging technologies—I think the question was asked earlier by Mr Banasiak in terms of who would be best placed to do some of that consultation work with communities—could it be the case that council would be best placed to play some sort of role there?

CHRIS DART: It would ultimately be a decision for the individual councils as to whether they wanted to do that or not.

The Hon. EMILY SUVAAL: They'd obviously want more resources to do that.

CHRIS DART: Yes, absolutely. That's right. They'd need some funding. It would be a decision for the individual councils; however, I certainly think they've got the capability to do that. I would say all of them engage their communities at the moment around waste services quite effectively.

The CHAIR: Thank you both very much for appearing today and giving evidence. I think you have taken on notice to provide some additional information. The secretariat will be in touch, and with further questions on notice as well.

(The witnesses withdrew.)

(Short adjournment)

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Dr ALI EL HANANDEH, Associate Professor, Environmental Engineering and Built Environment, Griffith University, before the Committee via videoconference, affirmed and examined

The CHAIR: You are acting entirely in an independent capacity, not on behalf of the university or any other group or organisation?

ALI EL HANANDEH: Yes. Affirmed. I am currently working with Griffith University and not representing Griffith University in any form or way. This is my own. Whatever I say is my own testimony, not necessarily representative of Griffith's standing.

The CHAIR: Can I just turn to the performance metrics that you have listed in your submission. In reference to ash recovery, you talk about bottom ash reused in construction. Are you aware of, or do you have any knowledge around, how much bottom ash will remain following the incineration process and the sorts of tonnages that will be available for, and able to be used, in processes like construction?

ALI EL HANANDEH: Typically in incineration, dependent of course on what goes in the material itself, it's typically around 10 per cent will remain as bottom ash. This can vary. It can be higher if there are some incombustible materials going in the feedstock.

The CHAIR: And what about fly-ash?

ALI EL HANANDEH: Fly-ash is another story. That could be up to, dependent on the cleaning process—modern incinerators will normally capture the fly-ash.

The CHAIR: But fly-ash also can't be re-used in any capacity. It's a hazardous waste. Is that correct?

ALI EL HANANDEH: It is.

The CHAIR: You also state in your submission, you reference some of the research that's been done, that newer incinerators are considered relatively safer with fewer reported health effects. That's not suggesting none, then?

ALI EL HANANDEH: We can't say there is no potential health risk. That's true. Based on the literature review that is available now, based on the peer-reviewed literature and meta analysis, the risk associated is much, much lower than the traditional incinerators that normally operated prior to 2000. In many cases, even lower than coal-fired stations. However, there is still a risk because we don't have long-term monitoring, and long-term impacts and chronic impacts may develop after a long term of exposure, for which we don't have that data. So, yes, we can't eliminate the risk 100 per cent.

The CHAIR: You're referencing there other research but, again, in your submission it states:

Technology specifics remain undisclosed, but the consortium claims it is "globally proven".

But, again, that's not evidence for them to claim that, but you've looked at peer-reviewed evidence in the research that you've undertaken.

ALI EL HANANDEH: That is based on the modern designs, and that's what they stated—that they are using the modern design that will meet the European standards, which normally is the current standard for modern incinerators. It's similar to what's used in Western Australia.

The CHAIR: Are you aware, though, that the European standards have continued to change and have become stricter?

ALI EL HANANDEH: Yes, that's true, and the New South Wales standards are very strict as well. I'm not suggesting that this is safe, nor promoting it. I'm not a proponent for waste incineration, but I'm just stating the facts that are available now in the literature.

The CHAIR: One of the facts that you've used there as well is that, when it comes to the dispersion and spread, the highest concentrations are within a two- to five-kilometre radius of the stack. Again, that's based on European models. Are you aware if the proponents here in New South Wales are stating similar information around that?

ALI EL HANANDEH: The statement there I believe I made based on the modelling that they have done for—was it Parkes or the other one?

The CHAIR: Parkes, yes.

ALI EL HANANDEH: Or Tarago, I think.

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The CHAIR: That's based on Parkes.

ALI EL HANANDEH: Yes. The dispersion is a big issue in many places, depending on the geography and the topography. If you have low wind, you have valleys and a contained area, that can cause issues with dispersion. But based on the modelling that they presented, it looks like that's where the concentrations are.

Dr AMANDA COHN: One of your recommendations was about the life cycle approach for evaluating alternatives and proposed energy from waste plants. I understand from your written submission that this is something you've got some expertise in. Are you able to explain specifically what you mean by that life cycle assessment approach? How does that work?

ALI EL HANANDEH: That is something, unfortunately, that has been consistent with many policies, not in Australia only but around the world—that narrow focus on one objective. For example, in many cases it would be for carbon reduction or increasing renewable energy production, without looking at the side consequences of the proposal. You might have a condition where you can actually reduce carbon emissions, but it may result in other side impacts like toxicity, like human health impact, like eutrophication. You might end up with situations where you have increased the renewable energy or green energy production and lowered carbon emissions but at the cost of, for example, other programs that become unviable, like recycling and so on. When you look at life cycle impact, you would not look only at one impact in particular, which is basically narrow vision—I call it keyhole vision—but you would look at other consequences as well. The model will consider other impacts and potential impacts, and also you would consider scenarios for failure, allowing for uncertainty, allowing for abnormal conditions and so on. That's what I think is something that we should always consider, not only focus on one particular objective and forget about the other, sometimes unintended, consequences.

Dr AMANDA COHN: I have a follow-up question which I appreciate may be outside of your expertise. Do you consider that the current planning system in New South Wales supports or enables that kind of approach?

ALI EL HANANDEH: It's something that should be considered and could be very easily integrated with the EIS—environmental impact statement. It shouldn't be a problem integrating with the current system.

Dr AMANDA COHN: I have one more very specific question. In your written submission, you submitted that high-temperature incineration may not fully destroy PFAS compounds. This is something that is a growing area of concern for communities in New South Wales, but also for the Parliament. You've also written that PFAS incineration may pose risks to agricultural land and food safety, especially when combustion is incomplete or waste streams are poorly characterised. What can be done to mitigate that risk, given that we know that there is PFAS in waste streams in New South Wales?

ALI EL HANANDEH: First of all, that is a very low risk—I must qualify that—because it depends on how much is coming in the incoming stream how much of it can actually escape the gas cleaning system. The current evidence from the peer-reviewed literature—the latest one was published last year, 2025—found very, very little evidence that this is actually a high risk. It showed that it is actually very low risk, so that's aside. But destruction of PFAS—because PFAS is a very difficult product in the first place, so the first thing is to eliminate or to minimise it in the incoming stream. That's the first thing, which is basically controlling what goes into the incinerator.

Make sure that the high temperatures remain very high, above 1,000 or above 800 degrees. Some PFAS will not even be destroyed at 1,000 or 1,200 degrees. Sometimes it might be cleaved into smaller—that's true—but it's a very small risk. That's what I'm saying here. The main thing is gas emissions have to be monitored, and probably you need some kind of continuous monitoring to ensure that the concentrations are low. Probably—and this is the latest recommendations from meta-analysis of the literature review of these incinerators—it is to actually also monitor the concentrations in the soils around the facilities to make sure that it doesn't exceed the concentrations that are safe enough or [disorder].

Dr AMANDA COHN: Are you able to share that evidence or that literature with us?

ALI EL HANANDEH: Yes, I can send the meta-analysis reference.

The Hon. MARK BANASIAK: Doctor, going to your submission, on page 3 you've got a performance criteria table there. Going to emissions control, can you break that down in plain English for us and for average people?

In terms of the proposed sites of Tarago and Parkes, how does that compare in terms of the international facilities and standards? Are they at, below or above those international facilities in terms of emissions controls?

ALI EL HANANDEH: All that we have are the models, and they are below international facilities standards.

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The Hon. MARK BANASIAK: So they're arguing that they're at international standards or above international standards?

ALI EL HANANDEH: They are at or stricter than international standards, correct.

The Hon. MARK BANASIAK: But you haven't been able to verify that with the available data?

ALI EL HANANDEH: I mean, it's only based on models because we don't have any monitoring data. I tried to look at the incinerator that's currently running in Western Australia, but there are no records. What I could find is that there were no records from 2025-26 that there was any exceedance of the limits that they're permitted to emit. That's what I could find. There is no monitoring data available that we can look at. That system or that incinerator is similar technology to what's proposed in Parkes and Tarago.

The Hon. MARK BANASIAK: From a scientific point of view, do you think it's important that any site have some level of baseline monitoring done first to ascertain what is the air quality level, what is the soil quality level and what's the water quality level before a project is approved and commenced so we can properly assess any long-term impacts?

ALI EL HANANDEH: I mean, it's advisable to have the background levels. The only thing that you have to be also aware of is that if there are any other activities besides the incinerator, that can also add to the environmental loads, so you should be able to separate the impact of the two.

The Hon. MARK BANASIAK: This might be out of your area of expertise, but you do say that there is still some unknown risk of long-term exposure or emissions. Do you accept that even if those emissions are below limits in terms of air quality et cetera, that doesn't guarantee market acceptance of agricultural products?

ALI EL HANANDEH: That's very difficult to say. I'm not an expert in market acceptance and all that, so I'd probably better refrain from answering that because I don't know.

The CHAIR: Dr Hanandeh, you also talk about that even engineered landfills pose risks due to liner failure. What of fly-ash disposal? Considering the fact that it is a hazardous waste material, for it to be disposed of in landfill, which is required—the residue that's produced from these incineration processes—it potentially poses risks then as well?

ALI EL HANANDEH: There is a potential, yes. If there is a failure in the landfill, then there is potential for contamination to groundwater. There is a potential if there is a failure in the liners. But we have to understand that engineered landfills now are not the hole in the ground where we just put things in it. First of all, it has to be a designated facility that will accept hazardous waste of that type and it has to be engineered to the level that will be able to handle such kind of waste and risk, so it will be typically lined. Normally there will be a geosynthetic liner and sometimes also compacted clay underneath, so if one of them fails, the other one will at least hold. And then also we have normally leachate collection systems, which also will collect any excess moisture and treat it before it can be released. There are multiple layers of protection but, even with engineering, you can't be a hundred per cent sure. We will always have to accept some level of risk.

The CHAIR: That hazardous material, the fly-ash—when you're talking about the treatment of it—would need to be treated at the site of incineration before it is transported once again. Is that accurate?

ALI EL HANANDEH: It has to be stabilised, yes.

The CHAIR: At least stabilised before it is transported and then potentially treated after the event. Of course, New South Wales has limited hazardous waste facilities as well.

ALI EL HANANDEH: I don't know. I did not review the sites available. But this is something, definitely, that whoever is proposing this proposal will have to consider—what are they going to do with their fly-ash and where are they going to dispose it?

The CHAIR: Doctor, in your recommendations, you say, "deploy energy from waste selectively". So, on what grounds?

ALI EL HANANDEH: This issue is a very complicated issue. Energy from waste is not only necessarily incineration. Incineration is one of the methods. We could have energy from waste via biomethane production. We could have energy from waste, even from landfills, by collecting the methane from landfill gas. We could have some other methods like pyrolysis and gasification and so on. There are a lot of ways to recover the energy. The problem also is that when you are considering the energy from waste, especially with incineration and thermal treatment—for example, gasification and pyrolysis—there might be competition between what you can recycle and what you can actually burn. If you are going to burn only the green, wet waste, that's not going to give you much energy return at all. In fact, it might consume more energy than what you produce. They definitely have to

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consider some of the other combustibles, like cardboard, paper, plastic and so on, to increase the energy value of your waste.

Is there a problem here between recycling and energy production? I don't know. That is the thing that we have to think about when I say from a life cycle perspective. Also, the amount of energy we deliver to the society—is it the energy we produce or is it the energy we save? You see, if you are, for example, recycling some stuff, you probably indirectly save some energy. Whereas if you burn them, yes, you're getting energy production, but is the energy produced more than the energy potentially saved? That is the thing that maybe we should consider as well. So, selective, and, if we can't do anything better with it, yes, that would be a good way. We always refer to "generally" and it's not always a hundred per cent correct.

We talk about the pyramid where we have the waste hierarchy. The best thing is to eliminate the waste in the first place. Then, if we can't eliminate it, at least reduce it. If we can't reduce it, at least re-use it in a way. Then, if we can't re-use it, then recycle it. After that, then we start talking about incineration. And then, after that, we start talking about landfilling. The issue between landfilling and incineration is unsettled. Even now, if you go to the literature, the debate between to bury or burn is still an open question. Sometimes burying is better than burning; sometimes burning is better than burying, depending on what type of material you are dealing with, the distances that you need to transport, technologies used, the nature of the location that you are considering and so on.

The Hon. EMILY SUVAAL: Thank you for appearing. I wanted to start with a question about the waste landscape here in New South Wales. How familiar are you with the current challenges that are facing New South Wales in terms of landfill?

ALI EL HANANDEH: I did my PhD in 2010 and it was about the waste management in Sydney, interestingly enough.

The CHAIR: Excellent. We might like to see a copy of that.

ALI EL HANANDEH: The PhD probably is available. For sure it's online from the library. I published quite a number of works about this, including considerations of energy from waste. Of course, there has always been a resistance to energy from waste, but there is resistance to setting up new landfills as well. So what do we do? If we can stop producing waste, that's the best thing. But as long as the society produces waste, we need a method to deal with it. What is the best way to deal with our waste, reduce harm to the society and get the best value for our resources?

The Hon. EMILY SUVAAL: Your PhD in 2010—it would be fascinating to see what conclusions that arrived at. Would you say that much has progressed since then, in terms of waste management in Sydney or New South Wales?

ALI EL HANANDEH: At that time, the big question was whether to send the waste to Goulburn or not send it to Goulburn.

The Hon. EMILY SUVAAL: It's still the question.

ALI EL HANANDEH: At that time the promise was that could last us—I think the promise then, if my memory doesn't fail me, was that should last us at least 50 years.

The Hon. EMILY SUVAAL: Yet here we are, and the current advice is that we are going to run out of landfill in 2030. Is that your understanding as well?

ALI EL HANANDEH: Yes.

The Hon. EMILY SUVAAL: I noted in your submission as well that you talked about LCA technologies as alternative solutions.

ALI EL HANANDEH: Yes. Go ahead please.

The Hon. EMILY SUVAAL: I'd just invite you to expand on that.

ALI EL HANANDEH: LCA is not—I'm sorry, this is just a correction. LCA is just modelling—

The Hon. EMILY SUVAAL: Alternatives.

ALI EL HANANDEH: Yes. You could look at multiple alternatives and look at their potential environmental impact using standardised methods, which is in the ISO 14040. You could look at incineration, you could look at landfilling, you could look at different approaches of recycling, and then you try to formulate some kind of waste management system that will meet your demand—your target. Of course, the modern life cycle studies also include life cycle costing into them, building the environmental cost—basically internalising

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environmental cost. Now, the newer generation of LCA studies also include the social life cycle assessment in the study—not only to look at the environmental impact. Then, of course, the next generation was to include the economic impact but also to look at the social impact. That would be a wonderful thing to do, if you look at any option and look at what can we do. Of course, at the end, it's important to understand that we can never find an optimum solution. We'll always find an [inaudible] solution, so they will have an array of solutions, but which one of them is the best compromise, basically.

The Hon. EMILY SUVAAL: Or the least bad, as we like to say.

ALI EL HANANDEH: Yes, the least bad.

The Hon. EMILY SUVAAL: I'm interested in picking up on this point. When you were discussing using that LCA approach, there were only two options that you mentioned there in terms of dealing with waste. Those two options were incineration or landfill. In terms of the short amount of runway that we've got before we run out of landfill entirely and people's red bins can't be collected, are there any other options? Is there anything else this Committee should be looking at, given the time constraints that we've got but also the level of opposition or reluctance, given that a number of regional areas and areas in Sydney also are saying, "We're not putting our hand up for another landfill, but we're also not putting our hand up for another energy-from-waste facility"? Where is it going to go? What are we going to do with the waste?

ALI EL HANANDEH: Definitely the best option to deal with waste is to minimise it. We should have some kind of programs that will encourage people to minimise the amount of waste that they're generating. That's the top of the hierarchy. The next one is to find ways to re-use whatever we generate. If we have generated waste, this waste could be somehow re-usable. That should be by design. A while ago I was interested in one particular component, which is the printers which were designed basically so that once you run out of ink, these cheap—

The Hon. EMILY SUVAAL: You buy a new printer.

ALI EL HANANDEH: You buy a new one, because they are designed to be waste. A lot of products are like that. Maybe we should look at these kinds of products, from not only electronics and all that but everything else. From a legislative perspective—

The Hon. EMILY SUVAAL: Sorry to cut you off. We have introduced product life cycle obligations now in New South Wales for batteries. That work is starting to get underway. But in terms of the time pressures that we are up against—I'm not sure if you were listening to the inquiry earlier today, but we heard earlier from local governments here in New South Wales that still haven't rolled out measures to compost food scraps. That would seem to me some really low-hanging fruit opportunities for those measures that you're talking about in terms of minimising waste. When we're looking at the hierarchy, we are trying all we can to minimise. We've mandated food and organics. FOGO is our food and organics recycling here in New South Wales. We've mandated that for councils, but there are a number that still, for whatever reason, are unable to roll it out. If we've exhausted all of the options we have to try and minimise and mitigate, what is left for us to do besides building a new landfill or an energy-from-waste facility?

ALI EL HANANDEH: If there is residual waste, it has to find a place. Unfortunately, at the moment, the only viable technologies we have for residual waste is either landfill it or burn it. But we shouldn't allow much of our waste to reach the point of residual waste.

The Hon. EMILY SUVAAL: I agree.

ALI EL HANANDEH: As you said, for example, composting is an option for organic product. Anaerobic digestion is another option for biodegradable organics. They all come at their cost. They all also—I'm sure you will find people who will have some objections to them. With composting, a major problem is do we have enough market for it. That is one thing. The other thing is there has been some evidence lately that some composting facilities also had contamination with PFAS.

The Hon. EMILY SUVAAL: In terms of the performance metrics table that you've popped in your submission, which I found very helpful, when you're looking at the international facilities—and you've mentioned there the reference facilities as being dozens across the EU, Japan and Singapore—are there one, two or three examples you can point us to in terms of what you would describe in your academic experience to be best practice or leading examples at the moment for this technology?

ALI EL HANANDEH: Singapore, for sure. The facilities in Singapore are run in very high-density population areas. There are also the recent ones that were built in Germany. All of the recent ones are built on the standards of the UK-EU 2000 directive. So they are all meeting very stringent standards. To me, from the documentations I could access about these two proposals, the two proposed facilities, they are also proposed to meet these standards.

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The Hon. EMILY SUVAAL: Wonderful. When you talk about carbon capture, you say it's emerging in the EU. Could you explain a bit more about that, what that involves and why that might be useful technology?

ALI EL HANANDEH: Again, I'm sorry, I don't have enough expertise to talk about the mechanisms of carbon capture from such facilities.

The Hon. EMILY SUVAAL: That's okay. But you've mentioned it is emerging and you've given the example of a facility in Oslo. Would that be something that the Committee could inquire into or look at as potentially leading the way or emerging in that field?

ALI EL HANANDEH: That is one direction now. That is emerging, as you mentioned it. The cost is probably an issue. So that is something that has to be looked at and that could be something that you, or whoever is proposing these facilities, want to consider the cost involved and how is it going to translate in the gate fee of the facility. I'm not sure whether it's going to make the facilities commercially viable or economically viable to the residents. But also, it's going to only deal with the carbon rather than dealing with other concerns.

The Hon. EMILY SUVAAL: When you talk about the energy from waste technology at a broad level, I'm interested in your thoughts around how much it has advanced or evolved, or how much it hasn't advanced or evolved, in, say, the last 16 years since you did your PhD.

ALI EL HANANDEH: If you look at the older ones—when we talk about older ones, we're talking anything before 2000—these ones were just basically a little bit better than open burning. Once you get after that, after the EU directive of the new generation, the modern generation, the technology has changed so much. That's basically because of the gas cleaning and the temperatures that they require. Most of the pollutants that people are scared of—these dioxins and all that—they normally form at very low temperatures. If the temperatures are high enough, of course there still could be a risk, but they're not the major concern anymore.

Then, of course, you have all these cleaning systems to basically clean the gas and release it as clean as possible. Can we have 100 per cent clean gas? No. Is the air 100 per cent clean? No. We have some of these—as one of your colleagues pointed out, is it good to have background monitoring so that we see what is the current system? Yes. You will find even with the current system, with what we have now, that some of these pollutants do exist. The concern is how much it will rise after.

The CHAIR: Thank you very much for your time and evidence. Our time has come to a conclusion. I think we may have requested some material from you, but the secretariat will be in touch for anything further. Thank you for joining us today.

(The witness withdrew.)

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Mr AMAL JUGDEO, Sales Director, Kanadevia Inova Australia Pty Ltd, sworn and examined

Mr ANDREW SHORT, Director of Project Development ANZ, O.C.O Technology Australia Pty Ltd, before the Committee via videoconference, affirmed and examined

The CHAIR: Thank you both for joining us and making time to give evidence today. Mr Short, as you are appearing from New Zealand, please note that the Parliamentary Evidence Act 1901 does not operate outside of New South Wales. Witnesses giving evidence from overseas will not be protected by parliamentary privilege. It is advised that you avoid making adverse or defamatory comments about individuals. Mr Jugdeo, I'll start with you. Your submission states, "Waste to energy is safe, be it in cities or regions." You're saying that the technology as it stands now is safe anywhere?

AMAL JUGDEO: Yes, Chair. If I may—

The CHAIR: I'm sorry, I've jumped the gun. Would you like to make an opening statement?

AMAL JUGDEO: I would appreciate that, yes. Thank you, Chair and Committee members, for the opportunity to participate in this important inquiry. My name is Amal Jugdeo. I have been with Kanadevia Inova Australia since 2021. I am currently the sales director for the Oceania region, with responsibility for the development of KVI's waste to energy and renewable gas opportunities across Australia. I am a chartered chemical engineer and a registered professional engineer in Queensland. KVI is headquartered in Zurich, Switzerland. Globally, the company has a presence in 17 countries, more than 3,500 employees, and has delivered over 2,000 waste to energy and renewable gas projects around the world. Our work focuses on decarbonisation, supply, security and resource circularity. Energy from waste, or waste to energy, as the term is used interchangeably, is not simply about generating electricity from waste. It is a residual waste treatment process. Its role is to manage the material that remains after avoidance, re-use, recycling and organics recovery have been applied.

KVI continues to deliver modern facilities internationally. Recent examples this year include projects in the United Kingdom, Switzerland and Italy. KVI is also delivering the UK's first full-scale carbon capture system for a waste-to-energy plant at the Protos Energy Recovery Facility, which is expected to capture around 370,000 tonnes of CO₂ per year. In Australia, KVI is also the technology provider for the East Rockingham waste-to-energy facility in WA. These projects demonstrate that modern waste-to-energy is a mature, internationally proven technology. In our view, it can play an important role in New South Wales as part of an integrated waste hierarchy, not as a replacement for recycling or waste avoidance but as a regulated alternative to landfill for residual waste. Thank you, Chair, and I welcome Committee questions.

ANDREW SHORT: Good morning. I am director for project development at OCO, responsible for developing our business activities in Australia as well as obtaining the relevant regulatory approvals necessary to operate. I have been at OCO for four years and was previously the estates director at Grundon Waste Management, the owners of OCO, so I've been involved with the company almost since its start in 2010. I'm a chartered mineral surveyor with over 30 years experience working on regulatory approvals for a wide range of mineral and waste management facilities and their development. I would like to thank you for inviting me here today and look forward to helping where I can. I apologise for not being there in person, but other matters have prevented me from doing so.

OCO decided to make a submission to the inquiry for the following reasons: first, our general support for EFW technology and as an important tool for residual waste management; second, to illustrate that under the right regulatory and market conditions, technology does exist that can commercially treat and recover, using carbon dioxide air pollution control residues, creating a carbon-negative aggregate for use in the construction industry; and, third, to encourage a reassessment of the waste framework, regulations and legislation on re-use of products made from waste, and the development of an end-to-waste process. Once again, thank you for inviting me. I hope to be of assistance in the inquiry into energy from waste in New South Wales as part of the waste management process.

The CHAIR: Back to you, Mr Jugdeo. Your submission notes, "Waste energy is safe – be it in cities or regions". Are you saying it's safe anywhere?

AMAL JUGDEO: I want to qualify that comment. I would like to say that the facility is designed such that it complies with regulatory requirements and the permit conditions. Overseas, and in Australia, KVI has numerous of these facilities in operation, and these facilities operate within the requirements of those permitted conditions. From that perspective, these facilities do operate within the framework of the regulations in the jurisdictions that they operate in.

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The CHAIR: A question for both of you, then, because each of you references it quite specifically. Mr Short, your submission states:

... recovery of Incinerator Bottom Ash (IBA) and APCr can provide a fully 100% landfill free option ...

Mr Jugdeo, your submission states:

Waste-to-Energy enables up to 100% recovery of materials for reuse ...

What about fly-ash?

ANDREW SHORT: It's because we recover fly-ash, and that's what we process. Historically, fly-ash has been landfilled—and by fly-ash, I'm referring to air pollution control residues, which I presume is what you're referring to as well. It's a material that is made of a very high lime, so it is deemed hazardous for two reasons. One is its high pH, and the other is it does have within it—because it's cleaning up the flue gas—mobile heavy metals. Our process recovers or treats that APCr by introduction of carbon dioxide. That, in two methods, has the ability to treat the APCr, and it does that by changing the heavy metals from oxides and hydroxides to carbonates. Hydroxides and oxides are highly soluble in water. Carbonates are, by several magnitudes, less soluble in water, and so they don't leach out of the APCr once treated.

APCr is extremely high in alkaline. The treatment with carbon dioxide brings that alkaline down. Our process enables us to manufacture a limestone, which is what the lime plus carbon dioxide does—it manufactures a limestone. It changes the chemistry of the APCr and then, within the lattice of the limestone, it traps the contaminants within that limestone so they aren't leachable in the environment. With IBA and APCr being used as construction materials, the energy from waste is, in fact, nearly 100 per cent landfill-free.

AMAL JUGDEO: If I may add, as Andrew mentioned, from the process you've got the waste going in. A percentage of that waste comes out as incinerator bottom ash. That's typically around 15 per cent to 20 per cent. About 5 per cent of the waste going in comes out as APCr, or air pollution control residue. That is by design. There are reagents added to the process—lime, activated carbon—that concentrates the pollutants in the flue gas. These pollutants are derived from the waste, and it concentrates them into the residues which then need to be disposed of responsibly because it is a hazardous waste.

The CHAIR: To your submission, Mr Jugdeo, it states:

Our facilities are safe regardless if built in city centres or regional areas... Waste to Energy plants are built in or close to large population centres to minimise transport of waste and in return energy back to the community.

With the residue hazardous products that you're talking about as well—again, for both of you—the suggestion is that it's better that it be dealt with close to the source.

AMAL JUGDEO: I can add that the APCr is just one component as a by-product of the process.

The CHAIR: But in saying that it's just one source—when there is 700,000-odd tonnes being proposed of waste being sent to Parkes, what proportion of that is suggested would be APCr?

AMAL JUGDEO: Residues.

The CHAIR: But specifically not the bottom ash residue—the fly-ash residue.

AMAL JUGDEO: It's typically around 3 per cent to 5 per cent of the fraction of the waste coming in that results in APCr.

The CHAIR: Mr Short, your view on the proximity minimising transport of waste and then by-products as well?

ANDREW SHORT: We've always used in waste management, in my experience, a proximity principle, which is that the facility should be located close to the source or the arisings of the waste simply to reduce impact of transport. Transport, whenever I've been involved in regulatory approvals, is normally the biggest concern of local residents. Having the facilities treating that waste next to where the arisings are just seems a sensible solution to that. In terms of the APCr that we treat, typically we would have an offsite facility. In the UK we have three facilities treating APCr, none of which are co-located. We transport from the energy-from-waste plants to a hub facility to treat that material. That's economies of scale more than anything else. It's always been the case in the UK, when I'm dealing with it, that treatment facilities are located adjacent to the waste arisings.

The CHAIR: Okay, so it would have to be another potential outcome. I'll hand on to my colleagues now for questions for you both.

Dr AMANDA COHN: Thank you for appearing today. I wanted to ask a question arising from your written submission where you said:

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The air dispersion modelling predicts ground-level concentrations of emissions coming from the stack. There will be no impact.

That is in direct contradiction of evidence we've received from the Public Health Association of Australia. What evidence can you provide to support that? You've made a very strong assertion of no impact.

AMAL JUGDEO: I would like to clarify that statement. I would say that the process requires detailed dispersion modelling and environmental health assessment impacts. The outcome of that will then dictate the acceptance of the permit, the approval of the permit and then the process to go ahead and construct such a facility. What we can say is that there are many facilities like this in Europe and elsewhere in the world, and we are not aware of adverse health effects in the communities that live around these waste-to-energy facilities. There are many of these facilities in high-density areas and, as I mentioned earlier in my opening statement, there are facilities being built as we speak.

Dr AMANDA COHN: Thank you for clarifying the statement that you made in your submission. The other question I want to ask is about the viability of these facilities. People have raised significant concerns that, to remain viable, they remain ongoing feedstock to the extent that in Europe, some countries are importing garbage and many people think this isn't something we should be pursuing in New South Wales.

AMAL JUGDEO: I would say that there is a significant amount of residual waste generated in New South Wales. Typically, the latest statistics indicate it is in excess of seven million tonnes per annum. If you look at our East Rockingham site's facility, which is the one in WA and is a 300,000 tonnes per annum facility, you would need 25 of such facilities to process that residual waste. Indeed, there may be certain scenarios in certain countries in Europe where one could argue that there's overcapacity, but it's certainly not the case in Australia, and New South Wales in particular, where the number of facilities that we are aware of that are under development would compromise the waste system where waste has to be generated to feed the system.

Dr AMANDA COHN: For the facilities that you operate elsewhere, are you entered into contracts that require the provision of certain tonnage of waste?

AMAL JUGDEO: Indeed, that's correct. But in Western Australia, in the East Rockingham facility, the waste contracts at the time were waste-arising contracts, which is quite a novel idea. It's such that councils are encouraged to recycle, and if they do not provide the tonnages that they're initially contracted to provide there are no penalties for that. That was on the basis that there's sufficient confidence in the market that there is sufficient waste to supply these facilities.

Dr AMANDA COHN: My last question before I go to my colleagues is that you've made a very specific recommendation around increasing the landfill levy, which I imagine would be a significant price incentive to support your own industry. Where has that recommendation arisen from?

AMAL JUGDEO: As KVI, the company, we provide the technology and build these facilities with local partners. One component of the business case of these facilities is the cost to build these facilities. It is a big component of the business financial model. What we see from discussions with our proponents is that the business case is challenged. The reason why we have these facilities being built and constructed in Europe, for example, is because there are sufficient levies that enable the business case to unlock for these types of facilities.

Dr AMANDA COHN: Are you saying it's not cost effective without the Government intervening to give you a price incentive?

AMAL JUGDEO: No, I am not saying that. I am saying that waste levies can boost the business case of the facility, if it is higher than where it is today.

The Hon. ROD ROBERTS: Thank you, gentlemen, for your submissions and attendance today. I'll start with you, Mr Jugdeo. I think my colleague touched upon it, but I really want to clarify page 6 of your submission under "the impact on agriculture locally and across the wider region". You state in your submission provided to us:

The air dispersion modelling predicts ground-level concentrations of emissions coming from the stack. There will be no impact.

Very unequivocal. You will agree, though, that there are variables that could change that, such as feedstock, such as human error, such as not complying with any regulated policies et cetera?

AMAL JUGDEO: Yes, as I mentioned earlier, I would like to clarify that statement. The statement is based on the proviso that the facility operates within the permitted conditions. A waste-to-energy facility has a single point source of emissions. If the plant is operated as designed and intended, the facility would be within the permitted conditions for the pollutants—the maximum levels of those pollutants. That would then imply that the necessary human health assessment impacts have been done and environmental impacts have been done to satisfy the regulators that it is an acceptable risk.

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The Hon. ROD ROBERTS: But if they're not complied with, we've agreed there would be a potential for impact though?

AMAL JUGDEO: If the facility is not operated as intended, or if waste that's not suitable for entering the facility is indeed processed through the facility, there are systems in place that prevent exceedences from the stack. The system does have continuous emissions monitoring systems. It has advanced control systems. When the system detects that there is a potential trend where certain pollutants are exceeding or approaching—or has a potential to approach—their emission limits values, then the facility will shut down safely. That then ensures that the facility will not exceed its emissions limits requirements.

The Hon. ROD ROBERTS: I'm glad we've cleared up your submission. Mr Short, is your company engaged by the proponents of either Parkes or Tarago to provide control of the APCr at all?

ANDREW SHORT: Yes, we're involved in both facilities as an option for air pollution control treatment. At the moment, because of the way the legislation works, that treatment is looking to purely treat it, to reduce the contaminants and reduce the hazardous nature of it to go to landfill.

The Hon. MARK BANASIAK: Picking up on the Chair's questions and comments around bottom ash, we had a previous parliamentary inquiry into what we actually should be doing with bottom ash out of coal-fired power stations. None of the recommendations were actually enacted upon by the Government in terms of developing a market where this by-product can be utilised. We still have all the bottom ash from those facilities sitting there underutilised. Can you give us some sense of—the jurisdictions you do operate in, what have they done with that bottom ash by-product? Have they had the same issue that we are now facing—that we are potentially going to have the bottom ash from coal-fired power stations to deal with, as well as potentially the bottom ash from waste-to-energy facilities to deal with?

AMAL JUGDEO: The bottom ash from these facilities are processed so that metals are recovered and recycled. That's a value-add stream. The remaining mineral aggregate is inert material. In the UK, for example, there are regulatory pathways for the aggregate to be used in civil applications. That happens today. In Victoria there are also regulatory pathways for the incinerator bottom ash as well for the Maryvale waste-to-energy facility that's being proposed at this point in time. There are indeed reference cases for incinerator bottom ash being reintroduced into the market in civil applications.

The Hon. MARK BANASIAK: We did hear that it could be used in road base materials for roads, but, effectively, the Government has not set up a market or a mechanism for that to occur, particularly in their own projects that they're running. What have those other countries done specifically to promote the use of that by-product?

AMAL JUGDEO: It's an alternative aggregate to be used in civil applications. It is blended with other aggregate material. That's how it's introduced into the market. The necessary testing and regulatory pathways need to exist for that to happen. It's a matter of governments having the necessary pathway to enable that to happen. It just hasn't happened in New South Wales. I mentioned earlier that it has happened in Victoria.

ANDREW SHORT: Can I just add to that in terms of the coal ash versus the ash coming out in terms of energy from waste? Part of it is the volume and the tonnages that are created by coal-fired power stations compared to the tonnages created by energy from waste, which is quite significantly less. Earlier you asked about what have other countries done. In the UK, we no longer have coal-fired power stations, but when we did, it used to be called pulverised fuel ash and was used in block-making. I think part of the difference in construction techniques is that in the UK there is a lightweight block used in construction and also a heavy block used in construction. That material all got fed into that. In fact, when the coal-fired closed down, there was a real shortage of that material. That is one of the markets that we feed into.

The CHAIR: Can I just ask for a point of clarification on that, Mr Short? When you're talking about the coal-fired ash and the fly-ash, or the APCr residue from energy-from-waste incineration, they're different, aren't they?

ANDREW SHORT: Yes. My understanding of the coal ash is that it's the actual ash from the coal burn.

The CHAIR: And you're saying that the APCr is more hazardous and is considered classified.

ANDREW SHORT: APCr is considered hazardous in New South Wales, in the UK, in Victoria and in Queensland. These are the areas where we operated. The APCr is hazardous due to the fact it's a high lime. The high lime, as Amal indicated earlier, is injected into the flue gases along with activated carbon, and that traps and treats the acids and the contaminants within the flue gas. It's not actually a direct result of thermal treatment; it is the treatment of that flue gas.

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The Hon. MARK BANASIAK: In your submissions, you talk about how this technology essentially closes the loop. You talked about the separation of heavy metals out of the bottom ash. What do you propose to do with the heavy metals that you've separated out from the bottom ash? Where do they go? How are they dealt with?

AMAL JUGDEO: I would just like to clarify that it's not the heavy metals per se; it's the iron and non-iron fractions of the bottom ash that are extracted. That goes back to the smelters and is re-introduced as iron, copper and you name it. There's a whole host of metallic components that is in residual waste. Waste to energy enables the recycling of that material. It's not heavy metals per se.

The Hon. MARK BANASIAK: Across the facilities that you operate, have there been exceedences of emissions at any time?

AMAL JUGDEO: I am not aware of—

The Hon. MARK BANASIAK: I'm happy for you to take it on notice and come back to us with a more accurate answer.

AMAL JUGDEO: I'm happy to take it on notice. I'm not aware of KVI facilities that have had exceedences that there isn't a reason for the regulators not approving such exceedences. I will take it on notice and provide the details around that.

The Hon. MARK BANASIAK: Regardless of whether a regulator allows you to do it—just whether there has been any exceedences?

AMAL JUGDEO: I'm not aware and cannot state—it's a facility from KVI at this point in time.

The Hon. MARK BANASIAK: I'm happy for you to take it on notice.

AMAL JUGDEO: Yes, I will take it on notice.

The Hon. EMILY SUVAAL: Thank you to both of you for appearing today. I might start with you, Mr Jugdeo. You mentioned earlier in the evidence with your WA facility a "waste arising" contract. Some of the concerns that we've been hearing from various submissions and witnesses have been around these energy-from-waste facilities requiring a certain volume of waste in perpetuity to be viable, essentially. Could you explain a bit more for the Committee why that's been able to be done in WA, what the implications of that are and whether that could be something that New South Wales could consider?

AMAL JUGDEO: Look, it's not for me to comment on the details of the waste contracts as a technology provider. That's for the proponents to comment on. What I can say, though, is that there is confidence that there is sufficient residual waste in the market that, if councils are improving their recycle rates and avoidance rates, there is sufficient residual waste to supply the two facilities that's in WA, because it's still a small percentage of the production of residual waste in the State. That's the message around waste arising.

The Hon. EMILY SUVAAL: In terms of the facility in Rockingham, how far progressed is that in the local area?

AMAL JUGDEO: Again, it's not for me to comment on that, because there are ongoing legal cases on the project. What I can say is that the project is under construction, and hopefully at some stage it will be up and running.

The Hon. EMILY SUVAAL: I'm particularly interested in—and it may not be a question for you, so I apologise. It's just that it's mentioned in your submission, obviously, this facility, and I'm just interested in what we could learn from that experience, if anything, if that's relevant. In New South Wales in particular, there's been a lot of concern within local communities about this technology. Is there anything that you could say from that WA experience or elsewhere, globally, that has been particularly important in ensuring that companies have that social licence to operate these facilities?

AMAL JUGDEO: As a company, we take full confidence in the regulatory process where these facilities are built, so we provide the necessary information to the regulators—it goes through a very formal health impact assessment, environmental impact assessments, and there are conditions that the facilities need to comply with. As a technology company, we have to design our process to comply with those requirements. I can state that the company, the technology we design and the facilities comply strictly with those requirements and cannot exceed those requirements.

The Hon. EMILY SUVAAL: But do you understand that the question is more about what gives you a social licence to operate within the community? Is that part of that process or within the regulatory environment?

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AMAL JUGDEO: Not so much for the technology provider. It's normally the proponents. But as the technology provider, we do support proponents. As I mentioned earlier, there are numerous of these facilities overseas in high-density areas, and there's no reason why it couldn't be in high-density, peri-urban, urban or regional areas. There's no restriction on that.

The Hon. EMILY SUVAAL: You need land, I think, is probably one of the restrictions we're facing here.

AMAL JUGDEO: Yes, but the point is that I think open-minded individuals can take comfort in the fact that these facilities are in operation, and in other jurisdictions and advanced economies they go through rigorous approvals processes, as well.

The Hon. EMILY SUVAAL: This might be a question of both of you. We've also heard some concerns around the sorting processes that are involved with energy from waste to ensure that we're minimising as much as possible what we need to put through that process. Is that something that either of your companies are involved in and wish to comment on at all as part of what you do?

AMAL JUGDEO: Absolutely. As a technology company, we fully support re-use, recycling and only the processing of residual waste. Another core business of ours is renewable gas and anaerobic digestion, which you may have heard from other discussions—that's also a core business of ours. As I also mentioned in the opening statement, KVI is building the largest carbon capture recovery facility, the first commercial-scale carbon capture facility in the UK. That is a demonstration of the company's commitment to encourage the minimisation of residual waste.

ANDREW SHORT: I was just going to respond to that as well, because of my experience with our owning company, Grundon Waste Management—we operate an energy-from-waste plant and landfill, and also waste treatment facilities. I was responsible for them. The social licence one is quite an interesting one. Around about 2002/2003, I went to a protest meeting against an energy-from-waste park we were proposing. They asked us why it couldn't be landfilled. A week later, I went to a protest group about a landfill that we were promoting, and they were asking us why it can't be burnt in an energy-from-waste park. You've got to weigh the two up. Social licence has to be for waste management, not necessarily just purely for the facility that's treating it.

I think as a waste industry, we don't treat our own waste; the waste we treat is the public's waste. It's having a form that is acceptable to that public to treat that waste. In our view, I think, the energy from waste is a less polluting and has less long-term impacts than our landfill might. I just wanted to mention that and also the matter of pre-treatment. As to landfill material, it costs the waste management company to burn material. They don't want to do it. As a company—Grundon Waste Management—if we could reduce the amount of waste we send to landfill or to waste treatment, turn energy from waste, we do. The gate fee is an incentive for the industry to make sure that waste isn't taken to a facility that costs them more.

The Hon. EMILY SUVAAL: That's an interesting point. In what way does that operate in reality? What are the sorting processes or diversion measures, if you like, that you might have at an energy-from-waste facility, Mr Short, to ensure that is happening?

ANDREW SHORT: Generally, there is a specification—well, there is always a specification for the councils or for the commercial entities putting waste into an energy-from-waste plant, and that will reflect the permits they operate under. In terms of what is the pre-treatment, most of the pre-treatment is away from energy from waste. We would have a number of transfer stations and recycling facilities that would try and take as much waste out of that waste stream as we possibly could. One would be materials that shouldn't be put into energy from waste but, equally, we want to take as much material out that we can recover and recycle, simply because we would get a gate fee, then, for the recycled material. The material going to the energy-from-waste plant is a cost.

The incentive is there, just commercially. As I said, we operate an energy-from-waste plant and we have a contract with the hosting council. That has a limit about how much total their waste can come to the energy from waste, so it backfires onto the council to also say, "We need to have facilities in place to make sure that the residual waste is residual."

And it costs the council money too to put it to the energy from waste rather than recycling.

The Hon. EMILY SUVAAL: Yes, absolutely. I'm interested in your submission, and you were talking about it earlier, regarding the treatment of APCr. You're wanting the inquiry to not automatically assume that this is toxic residue. I invite you to expand a bit more upon that.

ANDREW SHORT: It is hazardous material. APCr is hazardous. I didn't mean to say it isn't hazardous. What I wanted the inquiry to consider is the fact that when people are speaking against energy-from-waste facilities, they often cite toxic residues and one of the toxic residues they refer to—and I'm not qualified to speak

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about incinerator bottom ash—is the APCr. It is hazardous. If you can imagine cement, it's an alkaline like cement. It looks like cement, it handles like cement, and it has heavy metals in it, which are leachable. So APCr in itself, yes, is hazardous. But if you treat it correctly then it can be used as a construction material.

What we do is treat the APCr and then we go to a second stage of creating a pellet, so the treated APCr is only a proportion of the material going into the pellet. And we create limestone. That limestone matrix holds the contaminants within. The treatment with carbon dioxide is a known treatment of heavy metals and it makes them significantly less leachable from the product itself. If you put water on APCr, heavy metals leach out of it. If you put water on our material, it doesn't. It encapsulates and it changes the nature of the chemistry. What I wanted was the inquiry to think, well, when people talk about toxic residues, yes, there's toxic residues, but they can be treated.

The Hon. EMILY SUVAAL: In terms of the hazardous or toxic material, whichever word you want to use, I note examples here where you've got this technology in the UK. How far advanced is that and what evidence do you have to support that it is not hazardous and it's being used in production, in industry, as a construction use?

ANDREW SHORT: We treat probably 35 per cent of APCr that's created in the UK. We treat about 300,000 tonnes and create around about 750,000 tonnes of aggregate. We have human health and ecological risk assessments in the UK and we are developing them in Australia. We've got an HHERA for bound material of use of our aggregate, and that would be in concrete blocks, concrete asphalt, and we're now developing one in Australian standards for unbound, which would be for road base et cetera, and for engineering materials. In the UK our material is used in concrete blocks, it's used in sub-base and it's used in concrete. We have quite an evidence of our material being used in the UK. For a concrete block, for example, because of performance standards of a concrete block—it's the physical rather than the chemical—we use up to about 25 per cent. So a lot of our material is blended with other materials, either more virgin materials or mixed with crushed concrete for use thereof. The added advantage of that, and also the use of the IBA, is that it negates the need for virgin materials to be used, so there's a benefit there as well.

The Hon. EMILY SUVAAL: How long has that technology been in place in the UK? How long have you been using these concrete blocks?

ANDREW SHORT: Commercially, we've been using it since 2011. But it is backed up and there are a number of papers that have been written about mineralisation and carbonisation. It is, I suppose, understood. We were the first to commercialise it rather than actually first to do it.

The Hon. EMILY SUVAAL: In terms of there being a degree of academic rigour around the safety, your evidence is that there are papers to support that?

ANDREW SHORT: To support the technology.

The Hon. EMILY SUVAAL: Perhaps on notice if you could provide the Committee with some of those examples, that would be helpful. If that's okay.

ANDREW SHORT: Yes.

The CHAIR: That's our time up. Thank you both very much for appearing and your evidence. Obviously we've requested some documentation from you, so the secretariat will be in contact with you in order to obtain that and in relation to any further questions that we might have and provide in written form. Thank you both for appearing today.

(The witnesses withdrew.)

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Professor HUGH DURRANT-WHYTE, Chief Scientist and Engineer, Premier's Department, affirmed and examined

The CHAIR: Thank you for making the time to give evidence today. Would you like to begin by making a short statement?

HUGH DURRANT-WHYTE: We have some involvement in my office in energy from waste. In 2020 we prepared and produced a report for the then Minister for the Environment, which essentially looked at the opportunities in energy from waste. We designed a process and a procedure which I believe was adopted by the EPA. We then had a second engagement last year for the current Minister for the Environment, Penny Sharpe, in which we reaffirmed, I guess, the views that we held in 2020 and also addressed three additional technical issues to do with the way that data was sampled, the uncertainty in data, and also something called slip ammonia, which is a result of things that are processed or reprocessed using ammonia. That's it.

The CHAIR: I might immediately go to questions, then, on what's apparently being processed and what may or may not be occurring with it, or intended to occur with it. You'd be aware that for the Parkes facility alone, with some 700,000 tonnes of proposed waste every year being sent out, according to the proponents, directly that will generate 120,000 to 150,000 tonnes of bottom ash and as much as 25,000 tonnes of fly-ash. Fly-ash is considered a hazardous material, is it not?

HUGH DURRANT-WHYTE: Yes.

The CHAIR: What is your understanding or view of what will happen to that, specifically the fly-ash? The bottom ash is a different proposal in terms of the potential for use as an aggregate in road base et cetera, but limiting ourselves to fly-ash and how it will be addressed.

HUGH DURRANT-WHYTE: Again, a lot of the details for that were outlined in our original layout for what should happen in the energy-from-waste industry. I assume that the Committee have seen this. We said it right at the outset that, if you like, the efficacy and also the operational limitations on energy-from-waste facilities will depend significantly on the input stream. I think if there was a concern we would have, it's the fact that there are relatively few input streams of the right kind of quality in New South Wales to make arguably more than one, at most two, facilities viable in that sense. We were pretty clear about that. However, we also said that the operation of these facilities can and should be considered as if they were any manufacturing facility generating waste, both in terms of air pollution and in terms of solid waste. It's no different from any other facility, whether it was energy from waste or manufacturing or whatever, because there are already procedures and guidelines and everything in place which are the best that there is or the most stringent that there are in the world for managing that waste from these facilities. We reaffirmed that in our 2025 submission.

The CHAIR: But that still suggests that as a hazardous waste material, it has to be dealt with in a hazardous waste facility.

HUGH DURRANT-WHYTE: Yes, but there are procedures existing in the EPA to deal with hazardous waste from any facility, not just an energy-from-waste facility. Those are the things which should guide this. There's nothing clear and differentiable about energy from waste than there is from any other facility which might also generate ash and fly waste.

The CHAIR: I understand, but what I'm saying is that the additional material that is going to be produced, potentially, from these energy-from-waste incinerators will need to be dealt with at a hazardous waste facility. So how many hazardous waste facilities are there currently in New South Wales, and what's their capacity direction in coming years?

HUGH DURRANT-WHYTE: I'll answer the first half first. Yes, there are guidelines that fly-ash must be dealt with in the way that the EPA specifies in its existing legislation. The second part of the question—I do not know how many hazardous waste facilities there are in New South Wales.

The CHAIR: My understanding is they're relatively limited, and so that is potentially an issue in terms of the tonnage that we're talking about and how much more may need to be addressed into the future. Given that you aren't aware of those facilities or what they should or can be addressing and their capacity—and I can tell you that, according to the EPA, hazardous waste landfill is currently under significant pressure—does this require more analysis as to what will happen in terms of the output, how it will be addressed and the capacity of these existing facilities to deal with it?

HUGH DURRANT-WHYTE: Quite possibly, but I should perhaps be clear about the role that we have in this. We are an organisation that really looks at the technical issues that are involved, and clearly we get approached to provide technical advice. We have not been approached to look at, for example, the scale of these

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waste facilities. We can be, but then, effectively, the Minister would need to actually ask my Minister to make that happen.

The CHAIR: But that certainly can be something that could evolve from that.

HUGH DURRANT-WHYTE: Yes.

The CHAIR: It may be outside your purview, but are you aware—my understanding from discussions with the potential proponents is that the material and the fly-ash specifically, 25,000-odd tonnes from Parkes alone, will then have to be transported back to Kemps Creek, which is one hazardous waste facility. From your professional experience and viewpoint, does transporting waste those significant distances, almost 700-odd kilometres, and it then needing to be brought back to the Greater Sydney region after it's all been dealt with—is there the potential for issues in that regard?

HUGH DURRANT-WHYTE: Let me do this in three steps. First step, when we did the original thing, we were well aware of the dilemma of the fact that, truthfully, the waste exists in areas like Sydney. To be honest, it wasn't a great plan to ship it to a faraway place and have it processed. It made a lot of sense, truthfully, to do that near where the waste was generated. There were additional issues associated with that, to be honest. The constraints on emissions for plants in Sydney were often lower than the ambient conditions in the air and things like that. Also, clearly, there is a social licence issue building facilities like this near where there are high-density populations.

Having said that, we were aware that people were proposing them out at Parkes and potentially other locations in the regions. It wasn't, if you like, within our terms of reference to say whether that was a good thing or a bad thing or anything else. I think you're now seeing that issue. You can take it out there, but you also have to ship the waste out there. That in itself involves a range of different issues. Originally when these were economic development areas, Parkes was in that category—there is a word for them which has slipped my mind at the moment. Wagga Wagga and a number of other places were also going to be recycling centres, in the sense of what came out of that waste stream and so on. I would agree with you that then shipping the highly toxic waste back to some other processing facility near an urban population does not sound like a very sensible thing to do. It would be more sensible to put a facility like that where you're actually processing the waste to start with.

Having said that, as an engineer, we quite regularly transport material which is not healthy, let me put it that way: everything from nuclear waste in other countries—not this one—to a number of other things. It's not at all an engineering issue to ensure that it is in high-integrity enclosures and that it runs on tracks which have clearly very high safety margins and so on. This is known technology. Is it being applied in this case? I do not know, because we don't review the designs or anything like that associated with particular things. I would imagine, however—to affirm what you were saying—that, frankly, it would be easier to have done this processing where you actually burn the waste to start with.

The CHAIR: And on the basis that there is—and as we've heard again today—the need for there to be other facilities, even to treat that residue before it can be transported or dealt with or put into other uses. It's not just the energy-from-waste facility; it does require other treatment plants and areas et cetera in order to deal with what comes out of it.

HUGH DURRANT-WHYTE: I would agree. Having said that, I would imagine there was a good reason—economic, probably—for companies wishing to do that type of processing somewhere else, either because they run other facilities or there is an existing facility or for some other reason, but I'm not privy to any of that information.

The CHAIR: Coming to your point that you made in your opening statement about your original 2020 report and the fact that now in 2026—that was an update rather than another comprehensive review?

HUGH DURRANT-WHYTE: Absolutely. We were asked to review this but, really, our statement was, "This stands." We were asked some very specific questions in addition, which we provided separately. They were really to do with the averaging period for data. That's important to understand pollution levels, the uncertainty in that data, what would be acceptable and how that is dealt with elsewhere in the world. The last one was to do with ammonia emissions.

The CHAIR: Again, using your word, you said that you essentially reaffirmed your 2020 report. So you don't believe that anything has changed in almost six years from what you first said?

HUGH DURRANT-WHYTE: Correct.

The CHAIR: What about the fact that European requirements have become stricter? Is that the case?

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HUGH DURRANT-WHYTE: No, they haven't. In fact, we went through both the American and the European ones and nothing has changed in that time period. In eight out of 10 categories, our requirements are more stringent than anything else that's out there.

Dr AMANDA COHN: Thank you for the table that you provided in your written submission, with all of the various limits. This was very helpful. I was specifically interested in the proposed US amendments.

HUGH DURRANT-WHYTE: Yes, I've seen those.

Dr AMANDA COHN: The existing US guidelines are very old. They're dated 2006. Specifically for metals—for mercury, cadmium and thallium—the *NSW Energy from Waste Policy Statement 2021* limits are an order of magnitude greater than those proposed US limits.

HUGH DURRANT-WHYTE: I would agree.

Dr AMANDA COHN: I was interested specifically in that question and why we've gone with a limit that's so substantially higher.

HUGH DURRANT-WHYTE: Because we are still below the limits that people are actually using and have set at the moment. The US ones that've been proposed have been proposed for some time now, and they've not been accepted. They have not been implemented and they are not passed in legislation. They don't exist. In the US, they are proposed, and they've been proposed for a long period of time.

Dr AMANDA COHN: So I imagine that the same reasons that they were proposed in the US would be the same reasons that they might be proposed or considered here.

HUGH DURRANT-WHYTE: I suspect that one of the reasons that they have not been agreed to is that they are at levels that are either not technically achievable or not warranted relative to, for example, ambient conditions of these metals.

Dr AMANDA COHN: So when you say it's not technically achievable, you're—

HUGH DURRANT-WHYTE: I said maybe—I'm not saying it isn't.

Dr AMANDA COHN: Okay, but it's possible that we're agreeing to limits that may still be harmful to health or the environment that haven't been technically achievable in other jurisdictions?

HUGH DURRANT-WHYTE: The answer to that is no. These levels in this table here that are set in New South Wales are not specifically for energy from waste; they are in general. For any manufacturing plant that you wish to put out there, these are the air limits and solid-rate limits for everything. If you look at them, they are entirely consistent with those that are set in Europe and the US at the moment—entirely. It may be that those are set—and I do not know; I would have to go back and do some additional research—at those levels because, in effect, those are ambient conditions. As an example—this is not metals but one that I am familiar with, the NOx argument—the limits on NOx are actually exceeded in Sydney before you even put a manufacturing facility there. Do you understand what I mean? So the ambient conditions are actually higher than the limits on output from the plant. That may be the case—I would have to do other research—with metals. That may be where they are, and also why the new limits in the US have not been accepted—because, effectively, they would be unachievable just because the ambient conditions are higher than the limits that you're actually imposing.

Dr AMANDA COHN: With apologies to the Chair, I have a follow-up, because this is going exactly where I was going to ask. I also want to ask this question about ambient conditions in baseline testing. Are you satisfied that current baseline testing would allow monitoring of emissions to actually determine whether future contaminants are from that facility or not?

HUGH DURRANT-WHYTE: Yes, and let me be careful here. One of the requirements in the original one-page guide as to how you should set up a plant and everything else was a measurement process—where the sensors were located, which are governed and so on, that the sensors are located, for example, on the emissions towers or in the residual flues and places like that, and that it had to be based on an existing and proven design. You could not build a facility that had not already been built somewhere else with those measurement techniques. So the answer is yes, plus or minus the error that we expect in the sensors, and I can come back to that in a minute if you like. We would expect it to measure exactly what the output level is from the facility in terms of emissions averaged over a period of half an hour to an hour—there is an argument about over what time period the data should be averaged, because you will or will not necessarily get peaks within that hour, if you see what I mean—and the fact that the errors on the sensors are allowed to be plus or minus 20 per cent within a 90 per cent error bar. Does that make sense?

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Dr AMANDA COHN: It does. What I'm really trying to establish—and I suppose I'm speaking from the experience of having chaired an inquiry into metals mining, where we looked at a number of contamination issues and where the operators of these mines will immediately use the defence that these things are present in soil naturally, and it took an extended period of time for the EPA to then issue significant fines to one of the operators who we had questioned. There's been a suggestion around the use of chemical biomarkers to ascertain the source of pollution, to differentiate that question between ambient conditions versus pollution from the facilities. Is that something that you've considered?

HUGH DURRANT-WHYTE: You could do that. I would suggest to you that if you are literally making the measurements at the point of emissions and if you're looking at airborne pollutants, those airborne pollutants are going to disperse potentially a significant distance from the facility itself, so you're better off measuring it in the flue than trying to put a lot of measurements in an environment where it will be spread or aerosol elsewhere. I would have said that was a good enough measurement. You could measure it in other ways. You could have biomarkers, but there are other ways of marking things as well. Or you could have a measurement a priori of what the environment levels were in terms of pollutants before you actually had the plant operating, and that would also give you a baseline to measure against.

Dr AMANDA COHN: Last question. Sorry, you've been very patient with me.

HUGH DURRANT-WHYTE: No, these are good questions.

Dr AMANDA COHN: We've also had conflicting evidence from different witnesses around the feasibility of continuous monitoring of emissions at the source. Is this something you've looked at and have a view on?

HUGH DURRANT-WHYTE: Yes, we have looked at it, and we don't foresee any issues at all. The only issues were to do with the averaging, so that was something we had to relook into for the second report because there are quite significant variations. Some averaging appears over a day and some only over a half an hour, and what would be the right level at which to do this.

Dr AMANDA COHN: Notwithstanding that kind of reporting or compliance period, it's technically feasible to do continuous monitoring?

HUGH DURRANT-WHYTE: Yes, absolutely.

The CHAIR: Just to come back to the point then about some data analysis on that, Professor. The data that we're relying on here for these proposed projects in New South Wales are all international data points?

HUGH DURRANT-WHYTE: Yes, in two ways. One is the actual numbers that they have to adhere to are best practice globally. The second part is in the guidelines—they have to build something that effectively has already been built.

The CHAIR: What about the questions and the concerns that have been posed around insufficient long-term data, both in those comparisons internationally as well and certainly the complete lack of it here? That is the first part of my question. The second part is we had it suggested by a witness earlier today that there are no public records on monitoring data from the Perth facility. You haven't been able to look at or address the Perth facility in that regard?

HUGH DURRANT-WHYTE: I would have to take those on notice. But I have here "Operating?" for both of the WA facilities. It's not yet clear that they are operating in a normal mode, so I suspect that's why there's no data.

The CHAIR: That's what has previously been suggested.

HUGH DURRANT-WHYTE: Having said that, there's plenty of data for all the ones operating in Germany, Denmark and a lot of other places. Although, again, let me put a small caveat on that. It depends significantly, of course, on the input feed—what is the waste you're putting into the plant. Truthfully, Germany and Denmark are much, much better at sorting their waste than we are.

The CHAIR: That's one of the points that has been raised consistently as well—the need for better harmonisation of our waste management strategy in terms of separating and resource recovery. We just heard from the last witnesses lots of discussion about how they're going to be doing that to make sure that it's getting to the best levels possible, obviously for them from an economic viability point of view. But we still have quite a bit of work to do in that regard, don't we?

HUGH DURRANT-WHYTE: We do. We had, I remember, a circular economy strategy that was delivered at about the same time we delivered this. I've not heard much more from it in the last five years. But

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you go to Denmark and Germany, and they separate things out at source into 10 to 15 different categories. At the moment we're just putting everything into one bin.

The CHAIR: What about evidence from the international perspective as well? Again, what I've read in various reports and information is conflicting. Some suggest that energy-from-waste facilities aren't actually contributing to better resource recovery, and others are suggesting that there are international examples where it's absolutely helping with resource recovery and the circular economy. Do we have a tried and tested position on that?

HUGH DURRANT-WHYTE: There are several interrelated factors there. It's true to say in Europe that they are much better at sorting from source than we historically have been here. Also, it is the case that they have got better with sorting in time. A number of energy-from-waste facilities I'm aware of in Germany have actually had to shut down because there is no flow, because they are now sorting things better. Having said that, the ones that still operate and have been operating have certainly contributed significantly in a positive way in terms of eliminating waste and eliminating, effectively, emissions from waste in other ways. They've been positive in that sense, in general. I'm sure you've all seen the picture of the ski resort on top of one in Denmark.

The CHAIR: I am interested to hear that as well. The ones in Denmark have closed because they haven't had the waste stream needed to keep them at operational capacity?

HUGH DURRANT-WHYTE: Certainly the ones in Germany. I'm less sure about the ones in Denmark. I know the ones in Germany have shut down because there is no more flow. I said at the very beginning, even in New South Wales, we have very limited—it would be hard to justify more than one or two energy-from-waste plants.

The CHAIR: In any of your analysis, have you been tasked with or have you looked at the reasoning and the justification as to the four sites that are currently listed to host the potential for such projects?

HUGH DURRANT-WHYTE: No, and we would never be asked to do that. As I said, we provide technical information. We do not provide policy.

The CHAIR: I'm not talking about a policy perspective. I'm talking about the technical aspects of the regional locations versus city or other locations. Why would it be suitable for a regional area and not suitable for a city area in terms of the technical specifications?

HUGH DURRANT-WHYTE: No, we've not been asked to. Were we asked, I think we would turn it down. We would not try to answer that sort of question. I think it's a bit beyond our purview.

The CHAIR: I'm going off the top of my head because I don't have it—I may have it here in my information. There was something specified in your original report around that, or around the travel distances or the regional aspect. I just don't have it to hand.

HUGH DURRANT-WHYTE: Yes, there's a second table, which is about the input—all the inputs that go in and how they need to be specified—and there's a transport component to that.

The CHAIR: On that, again, what has been the breadth of that analysis in that regard? Do you get to look at the technical components of potential impacts of those transport movements and the additional transport movements?

HUGH DURRANT-WHYTE: No.

The CHAIR: None of that? That's not within the—

HUGH DURRANT-WHYTE: No, it's all about the material and the impact that would have on emissions.

The Hon. EMILY SUVAAL: Thank you, Professor Durrant-Whyte, for appearing today. My question is probably quite simple, in terms of what I see as the two technologies for dealing with waste that we have at the moment in New South Wales, at least at any sort of scale—those two being landfill or energy-from-waste facilities. Is that a correct characterisation of your understanding of the waste landscape in New South Wales?

HUGH DURRANT-WHYTE: With the exception of recycling, yes.

The Hon. EMILY SUVAAL: Of course, and things like the food organics waste schemes. That being the case, if we were to stack the two up together—landfill first and energy-from-waste facilities—which one is, generally speaking, more harmful to the environment?

I know it's not an easy answer.

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HUGH DURRANT-WHYTE: Well, you have a pile of waste. It comes in. You would ideally like to recycle as much of it as you can. That's a technical and an economic issue as to how much you do in that area. I think, of that, you should burn what you can, because that is then controlled in terms of the way that the emissions and the residues come out. When you put things in landfill, that's it; you really can't do much else. That is as challenging in a social licence sense, and as challenging in a potential emissions sense, and so on.

The Hon. EMILY SUVAAL: Is energy from waste safe or at least as safe as landfill?

HUGH DURRANT-WHYTE: Yes.

The Hon. EMILY SUVAAL: Would you say it is, by current standards, in many instances safer?

HUGH DURRANT-WHYTE: Based on the European experience, yes.

The Hon. EMILY SUVAAL: And the parameters that we have for approving or permitting it here in New South Wales are of that European standard?

HUGH DURRANT-WHYTE: They are better than any of them globally, as I've said a few times.

The Hon. EMILY SUVAAL: In terms of your comments in your opening remarks about the input streams, I'm interested in a bit more of your explanation around that. We are confronted with what we see as a waste issue and running out of landfill and, obviously, the projections of there not being any available landfill after 2030. But then, on the other hand, you're saying that perhaps there is a lack of sufficient input stream to justify more than one or two energy-from-waste facilities.

HUGH DURRANT-WHYTE: It comes back to my answer to your earlier question. You have a waste stream. You can't burn all of it, because there is stuff which just makes no sense to burn—it produces no energy or potentially is difficult in other ways—so you have to put that in landfill. But you really would like to burn as much as you can. The waste stream is a matter, more than anything else, of consistency. You have to, effectively, design your facility to burn a particular class—or classes—of waste, and you have boundaries on those sort of conditions. If you exceed those boundaries and you give it something that it's not used to burning, it won't burn it properly, and then you are in all kinds of grief. The waste stream PID is, do we have the consistency, at scale, of a particular subset of waste that we can actually burn efficiently and safely—and the rest of it, effectively, goes to landfill—or is that just not sustainable enough? In the end, we have a role—although we think we have a lot of waste, we don't have as much as Europe. Do you see what I mean?

The Hon. EMILY SUVAAL: Yes. In terms of other innovative technologies or solutions to dealing with waste, I'm aware of and attended recently—it wasn't recently; it was probably two years ago now—one of your breakfast series seminars—

HUGH DURRANT-WHYTE: Good.

The Hon. EMILY SUVAAL: —where I think Macquarie University presented on the amazing Galleria caterpillar. I'm interested in whether there is more of that work underway and whether there are other examples that you could speak to—obviously, acknowledging that perhaps we're not quite there, in terms of scale. What other solutions are out there?

HUGH DURRANT-WHYTE: That's a very good question. There are a lot of things going on, and it's not just caterpillars; it's areas like synthetic bacteria. These days you can design bacteria to eat, effectively, different types of waste and convert it into something useful like fuels which are much more efficient or into some other category. There's a lot of work happening in that area. In fact, Macquarie Park holds some of the best people in the world in designing bacteria or redesigning yeast, for example, to process waste in particular ways to produce interesting outcomes. That is a great thing to do. Again, probably one of the challenges that we have is that our waste is very varied, and bacteria—you design them to really eat one kind of thing. What we've been really good at is, for example, bacteria to eat cyanide-laden gold. As an example, that's a pretty good way of doing things, right?

Overseas, the company I'm aware of in Macquarie Park designs a lot of bacteria for Brazil, because they have a lot of woody vegetation leftovers and things like that which they used to burn. Now they can actually use it to convert it into fuels of other types and that sort of thing. It can be done. Is it going to be done in my lifetime? Maybe not. We'll see.

The Hon. EMILY SUVAAL: But at least not in the next 3½ years, when they're running out of landfill.

HUGH DURRANT-WHYTE: Also, be careful because it's not a magic thing. I think it's something we need to keep our eye on, and we will, but I don't think it's going to solve the immediate problem of energy from waste or whatever else it may be.

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The Hon. EMILY SUVAAL: It's fascinating, nonetheless.

HUGH DURRANT-WHYTE: It is. Caterpillars—get some. Check.

The CHAIR: On that, Professor, is there anything further that you feel the Committee should know or that should be taken into consideration, in the absence of a submission as such? Is there anything that you feel we should know that could better help our deliberations as well?

HUGH DURRANT-WHYTE: No. In terms of the terms of reference, there are some specific things around the specific sites which I'm not really able to comment on. In terms of the general design of energy-from-waste facilities and the fact that those exist in multiple places and have been operating effectively, I think that's worth taking into account. I do think the market limitations that we have in this country are a challenge. Proponents have to abide, effectively, by the way that we've laid out these things here. Everyone needs to make sure that they do, indeed, abide with those. I think the measurement questions that Amanda asked are on the money, and that probably needs to be thought through carefully. I think those are probably the main pieces.

The CHAIR: On that—and, again, this may not be a question that you're able to answer—coming back to the point that you just made about the market and competition, that is an element of it as well. Obviously, if we're talking about two facilities as opposed to four facilities, and we're talking about two proponents, it's a limited market that we are discussing.

HUGH DURRANT-WHYTE: Yes, I would agree, but one would expect the market to figure that out themselves. You wouldn't go into a market that's already saturated, I hope. The reality is we also, ourselves, personally, on the street level, have to get better at sorting our material out. The most effective thing we could do would be solving that problem, actually.

The CHAIR: That, of course, also requires significant investments, education and awareness.

HUGH DURRANT-WHYTE: I agree.

The CHAIR: What about the fact that, as you acknowledged earlier, it was an update that has been provided to your original 2020 report? There are calls for there to be an entirely new review conducted. Given it's 2026, even the proponents admit that, should they get the go-ahead tomorrow, it would take them four years before a facility could be up and operational. Do you personally feel that there is a need for a comprehensive new review in 2026?

HUGH DURRANT-WHYTE: I don't believe anything substantial has changed since we wrote this original report. There have been no changes globally, and requirements—the designs are the same, dot dot dot. This is not an area which is innovating hugely at the moment or over the last 20 years, I would say. I don't foresee any need to do that. As we did in the update, there are occasionally additional questions that need to be answered that have come up—for example, measurement and things like that. That I can see. I will again emphasise that everything we've suggested in the original report relied on legislation that the EPA already held. We were not proposing that there needed to be new, separate legislation for energy from waste because, in the end, like another power plant or whatever, it still needs to satisfy the same output conditions, which are as stringent as they need to be.

The CHAIR: But even the framework that the EPA is developing right now is not about emissions. They're not looking at emissions and the technical specifications of that like you are; theirs is more the framework on how it will be rolled out. Is that accurate?

HUGH DURRANT-WHYTE: Let me try and be careful here. I'm not good at being careful. We very deliberately put everything you need to know to build an energy-from-waste facility on one page.

The Hon. EMILY SUVAAL: It's a very small box.

HUGH DURRANT-WHYTE: It's very small writing, I admit. Our objective was not for EPA to skirt around this—designing new frameworks, new ways of doing things or anything else. You start here and you work through to here, and then you're done. That was the idea. Okay, we had the input conditions, but the same thing applied—one page. It should be not confusing but straightforward and using existing legislation and processes, and so on and so forth. I would be reluctant for them to think that there needed to be some additional piece on top of this when this is entirely numeric. I can put numbers and KPIs on everything in here and it's not open for an opinion. So I don't want EPA to just have their own opinions.

The CHAIR: So we don't need to muddy the waters any further, given how much information there is in the ether around—

HUGH DURRANT-WHYTE: Yes. I will try and be careful again and say absolutely I agree with you.

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The CHAIR: So the best way to address that, in your professional view, would be the further refinement or additional questions that could be added, or if there are gaps in that that haven't been looked at. As I referenced a little earlier today, that would be the most effective way to highlight further concerns, rather than something separate and trying to start from scratch.

HUGH DURRANT-WHYTE: Yes, agreed.

Dr AMANDA COHN: In listening to the evidence, another question has occurred to me. You mentioned the air in some metropolitan areas already exceeding limits for nitrogen compounds, which is very sad. One thing that hasn't yet been explained to this Committee in an explicitly clear way is how these four precincts have actually been identified. Is it possible that this is because these are areas close to Sydney that actually have very lovely, clean air and therefore—I don't want to say the word "capacity"; it feels horrible—capacity to be polluted and meet standards?

HUGH DURRANT-WHYTE: Again, the specific sites, and the choice of specific sites, we were not at all involved in. You can go out to public data and look at the NO_x levels next to the M7-M4 intersection and it will be higher than these.

The CHAIR: I'm sure there's something else that's following on from that that's percolating in my mind.

Dr AMANDA COHN: I have lots of follow-up questions, but not for you.

The CHAIR: Thank you, Professor. Did we take some questions on notice or further information? Either way, the secretariat will be in touch around all of that. Thank you for your evidence and your time today.

(The witness withdrew.)

(Luncheon adjournment)

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Ms ALEXANDRA BARRATT, Emeritus Professor of Public Health, University of Sydney; and Member, Sydney Knitting Nannas and Friends, affirmed and examined

Ms KEELAH LAM, Member, Sydney Knitting Nannas and Friends, affirmed and examined

Ms CATHY GILL, Member, Sydney Knitting Nannas and Friends, affirmed and examined

The CHAIR: Good afternoon and welcome to each of you, and thank you for taking the time to give evidence today. Would each or any of you like to make a short opening statement?

ALEXANDRA BARRATT: Yes, I will make it. Sydney Knitting Nannas and Friends is a group of citizens working to safeguard our land, air and water for future generations. The energy-from-waste proposal has many problems. We would like to highlight three. Firstly, health risks: Incinerators, even new generation ones, release particulate matter air pollution, which is detrimental to human health generally. Incinerators are worse because of the emissions of toxins, including known teratogens and carcinogens. Health literature leads us to conclude that while new incinerators may be less harmful, we cannot be assured that they are safe to be located near residential and food production areas.

Secondly, social licence is absent. We have seen how the Sydney proposals met with much opposition and ultimately failed. Now the proposal is moving further west to a less-dense population, but every proposed area has water sources and food production which will receive these toxic particulates, and that food and water will be consumed by the people of New South Wales. Communities do not trust incineration and they will resist them. Thirdly, incinerators, like other combustion power plants, make CO₂ emissions. The New South Wales Net Zero Commission has already reported that New South Wales will have trouble meeting its net zero targets and its obligations under the Paris Agreement. Incinerators are very inefficient sources of electricity.

New South Wales instead must make clean energy from renewables. Yet we agree New South Wales has an acute waste problem. What is the solution? Energy from waste is the opposite of a solution. It will perpetuate a linear system of waste production and management. The only genuine solution is to urgently address waste at its source with strong zero waste legislation, together with extended producer responsibility legislation. We know this can work. For example, container deposit legislation in place in South Australia produces clean, separated materials, facilitating high-value recycling—in contrast with the contaminated material from commingled recycling. Extended producer responsibility legislation makes manufacturers legally and financially responsible for their packaging and products at end of life. New South Wales has implemented such legislation for batteries starting in October this year. We urge the New South Wales Government to use this as a wider template. Hundreds of cities across Europe and more around the world are adopting zero-waste policies.

We have brought with us detailed information on how zero waste can be achieved within 10 years. In conclusion, energy from waste with more pollution, more health hazards and more carbon emissions is not a solution; it's just a raft of future problems. It may seem easy to look away from those problems, but history would not look away from decision-makers who left mountains of toxic ash for decades to come. We urge the New South Wales Government to adopt zero waste and producer responsibility legislation as the only safe, sustainable solution.

Dr AMANDA COHN: Thanks so much for making the time to be here. I'm particularly interested in the alternative solutions that you're talking about. If you've been following the inquiry, many of the proponents of these incinerators justify them with the argument that we don't have better alternatives to reduce or deal with residual waste. You talked about product stewardship and extended producer responsibility. Do you have any examples you could speak to in other Australian jurisdictions or overseas or where those kinds of schemes have been put in place and what they look like?

KEELAH LAM: I was born in 1943, before the invention of designed obsolescence. Everything that was made when I was young was made for long life and repair, or it could go back into the earth without causing any problem. I lived overseas in Malaysia for 17 years. I went there before they had any plastic, and I watched the embrace of consumerism in that society. When I came back to Australia, I realised—in 1993—through the earthworks course that the EPA offered, that what we're doing is wrong. What we're doing is making things for short life and to throw away. There is an excellent series of videos by Annie Leonard called *The Story of Stuff*, and if you haven't seen them, they're really excellent. They describe, firstly, the linear system that we have in place.

At that time when I came back and I got involved, in the area where I live in Balgowlah they had a dairy, and every morning the big dairy truck would come in. The big container truck would come in, and there would be people employed to sterilise bottles, refill the bottles and other people to deliver the bottles and collect the empties and bring them back. That is the perfect example because each bottle, after about 100 uses, would be so

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scuffed that they would send it just down the road here to the glass factory to have closed-loop recycling of glass. It's really, really efficient. That glass remained in the system forever, and each bottle would be used about 100 times, and the cost of the bottles would be a fraction of a cent. It was Coca-Cola that brought in the idea of getting cheap plastic that's made to throw away, putting the onus on the community and the cost on the community, whereas it had always been industry's responsibility and cost.

ALEXANDRA BARRATT: May I add to that with an example from the healthcare sector. Part of my role is giving advice about decarbonising the healthcare sector. At the moment, State governments and the Commonwealth Government are on a pathway towards eliminating waste in the hospital system, which generates, currently, enormous volumes of waste. The aim is to get rid of the waste by moving up the waste hierarchy: number one, reduce; and number two, re-use. What that means is that, instead of having a disposable laryngoscope, for example, you have a re-usable one, which then gets used and sterilised and used again. It's the same thing; it can be used over and over and over again. That is the way that the hospital system is going. They are very keen to phase out as soon as possible the single-use plastics. This is effective and cost-effective. There is an up-front cost because you have to buy the re-usable equipment, but over 100 or 200 uses it actually becomes cheaper, so there's an economic incentive to do it. It also will reduce carbon emissions as the grid becomes increasingly decarbonised, because then it will have a lower footprint than using the single-use disposable items.

KEELAH LAM: Nitrous oxide—that's a really good one.

ALEXANDRA BARRATT: I'm not sure that's directly relevant, though.

CATHY GILL: I might add also—I think you asked for an example. I can't name one example, but the research I was doing was the zero-waste cities. Across Europe, 500 cities at this stage are taking it up and are on the path to zero waste—and not only in Europe, across America too. I could see in some of the cities in America—and I'm happy to give you the references to these, but I don't have them with me now—where they set the targets: By 2030 we'll reduce it by this much, taking the steps along the pathway, and by 2040 moving towards being totally zero waste and choosing not to have incineration.

As Alex said, incineration is at the bottom of the hierarchy of waste management. It will leave a terrible legacy with, as we heard in the earlier sessions, the toxic mountains of ash and of really toxic heavy metals. They might be fine particulates, but going into the air across the land. The objection over at Matraville was the high stack will solve the problem, but the research was coming through that it would spread so far. That leaches into the land and into the water systems. It leaches right through everywhere and, therefore, it's creating more forever chemicals. It's really the opposite of managing waste; it's really kicking the can down the road and creating terrible health effects.

Dr AMANDA COHN: You mentioned some of those examples of cities overseas that have adopted some plans. It would be great, perhaps on notice, if you could provide us with some of those examples.

CATHY GILL: I'd be very happy to.

ALEXANDRA BARRATT: I'm a professor of public health. Waste disposal is not my area of expertise professionally, but I was reading the literature on this and a number of things struck me. The first is the health effects from incineration. The evidence around that is that it most affects women. I hadn't realised that; I hadn't appreciated that. The evidence is strongest for the reproductive effects.

The CHAIR: Are you able to provide references to that material?

ALEXANDRA BARRATT: Yes. In fact, actually, I've already tabled them.

The CHAIR: So that's this information that you've presented today?

ALEXANDRA BARRATT: Yes, there's one document there which is about reaching zero waste, and there's another one which is my summary of the health effects, and there's two references given there. The evidence is strongest for adverse effects, preterm birth, congenital abnormalities. That's biologically consistent because we know that these heavy metals, for example, that are emitted—they're known teratogens. There's also some evidence of increased risk of cancer, which also makes sense, because they emit known carcinogens like dioxin. That was one thing that really struck me. The other thing is the second of those references that I've provided. It looks at different types of waste disposal. It looks at incinerators, but it also looks at landfill. Those same risks are apparent, if not stronger, for landfill. The problem can't be resolved by switching from incinerators to landfill. The problem is actually the waste. The only way to deal with the waste safely is what my colleagues are advocating—it's zero waste. That's the path that we need to get onto, for health reasons as well as for just improving the wellbeing of all of us.

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The Hon. EMILY SUVAAL: Thank you all for your time to give evidence to the inquiry and for being here today. I want to ask you a couple of questions about the notion of zero waste. Ms Lam, your comments earlier, I indeed can remember the time when I had milk delivered on our front doorstep in glass bottles and the competitions at the local school in collecting the number of foil caps, and who could get the most foil caps. In hindsight, it was also probably a re-use or recycling perspective. Given some of the additional complicating factors that we have in society today around planned obsolescence, as you put it, how practical do you think it is to be able to implement some of what I see as sometimes behavioural changes that are needed to get to a truly zero waste society, given some of the time frames and issues that we have?

KEELAH LAM: You have a copy of *Zero Waste in 10 years*?

The Hon. EMILY SUVAAL: Yes.

KEELAH LAM: That was initially written by the Waste Crisis Network at the Nature Conservation Council.

The Hon. EMILY SUVAAL: Is it from 2003? That's what it says on the front.

KEELAH LAM: I think it was from about 1995, but maybe it was. I'm not sure of the date. I've lost my train of thought.

The Hon. EMILY SUVAAL: Apologies.

CATHY GILL: How to achieve it.

KEELAH LAM: Yes, how do you achieve it? That *Zero Waste in 10 years* is pretty prescriptive. You can go by different products. What do you call it?

CATHY GILL: The example—I think I saw you nodding—we've got it with batteries. We start at the low-hanging fruit and you move up through the system. It does involve, really, as Keelah has said, legislation, or regulations that really must be compulsory, and it takes a lot of education. You have to get the population on board. You have to get the population with you. You know, look at the mountains of waste we're creating. But it has been created and there's so much that can be done. There's so far to travel, but we can take it in hand and it's very possible.

KEELAH LAM: I've thought of the word. It's sector by sector. It can be prescribed sector by sector. I was on the State Waste Advisory Council that Bob Carr set up. He introduced reduce waste by 60 per cent by the year 2000. Each industry was required to reduce their waste by the year 2000. It was really heartbreaking because there was no requirement by industry to take responsibility. They dug their heels in and I was quite horrified to see what was happening. They got rid of that Act. They took us down to look at the Woodlawn mine, the ex-copper mine—the deepest hole in the Southern Hemisphere. On the south is Lake George. It's below Lake George. On the north is Sydney's drinking water catchment and on the west is our farmland. They just chucked in the towel because it was too difficult, but it is very easy.

When industry is required to reduce the waste, they will themselves design waste out of the process. They will design repair, re-use, upgradeability and refill-ability into the process. In that process, once you change one product to make it long-life and durable, you will also increase jobs locally—re-localise jobs that used to exist and no longer exist, like the electronics repairs, refilling bottles. There was a juice company in Queensland. Coca-Cola went into all the little local shops and asked them to stop stocking these drinks and put in Coca-Cola, but the community stood up against them for a certain length of time because this company had refillable bottles. Now they've gone the way of the rest because people think they're saving money by buying things that cost less. But in the long run, we, the community, are the ones who are paying for the environmental damage from the amount of waste that is being made by industry, who get off scot-free and go laughing all the way to the bank, and we have our tips filling up. And now it looks like we're going to have mountains of toxic ash in replacement for having durable, long-life products that can be repaired.

The Hon. EMILY SUVAAL: When we talked about the extended lifetime product responsibility scheme, we started off with batteries, which you obviously agree with as an approach. As the low hanging fruit, what are your views or aspirations around what could be next for that?

KEELAH LAM: I would say the obvious things are people are very worried about microplastics. Most of the products we buy in the supermarkets are in plastic. Even the drink companies—Coca-Cola and the beverage industry fought so hard just before 2000 to stop container deposit legislation. If you have a meaningful deposit on things, it works as a carrot for consumers to pay that money and then get it back. If the thing has no more life, they can take it back, get their money back. For industry, if they have to pay for that product at the end of the life and there's nowhere for it to go, then they will have an incentive to design the waste out of the system.

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I remember in 1978—I wasn't here—South Australia introduced container deposit legislation purely as a litter measure. But the people were very keen to take the bottles back and get their 10¢ and, when they took the bottles back, they were cleaned and sorted. During this period when Bob Carr was the Premier, Coca-Cola decided to make plastic bottles with recycled plastic inside two layers of virgin plastic. Where did they get their recycled plastic from? Not in New South Wales. We had no container deposit legislation, so people put things in their bins and they were filthy. They went all the way to South Australia, brought them back to put in their factory in Western Sydney.

If industry is given the responsibility, if they're not let off the hook, they are the best people to think of the solutions. I have, over the last 30 years, thought of many solutions. Even packaging in supermarkets, I believe there's a much better way. It might not be the best way, but we could use glass, aluminium, stainless steel packaging. It could be like the Russian dolls that fit one inside the other with screw top lids, so that the supermarkets don't take up so much space when they get the return of the packaging and then they can go back to be recycled and refilled. That might not be the best answer. There might be others, but industry will find the best solutions when they are forced, when they have no alternative.

The Hon. EMILY SUVAAL: What would you say to the scenario—obviously current projections here in New South Wales are that we will run out of landfill in 2030 based on current modelling.

KEELAH LAM: Of course. When Bob Carr decided to send all our waste to Woodlawn—to me it was quite obvious and things have got far worse now. There's way more waste now. Industry is all laughing their way to the bank.

The Hon. EMILY SUVAAL: What do you say to a scenario—it's in a relatively short period of time, obviously, 3½ years.

KEELAH LAM: In 10 years, if we follow the zero waste in 10 years policy, we could reduce the waste so much that the tip will fill up more slowly. I believe, once we've got zero waste in practice, it would be beneficial to mine tips and get out all the renewable resources out of the tips. It's incredible. I live in the Manly area. I can't believe that families put the whole household out on the footpath—1920s beautiful timber furniture. The garbage truck comes up and crushes it and sends it to the tip. People put out perfectly good clothes, shoes and electrical goods. These are all getting crushed and sent to the tip.

Another solution might be, while we're getting zero waste into action—for instance, with pianos and furniture—to have a huge warehouse out in one of the dry areas where this furniture can be taken. We could employ young people to turn the furniture into other smaller pieces for smaller dwellings and keep them until people realise that stupid chipboard products that people are tricked into buying because they're fashionable are not worth the money. People will want to get things that are quality and long life. We need the incentive there. That has to be meaningful deposits and refunds.

You might think that poor people will suffer if we do that, but I was sitting on Professor Stuart White's citizens' jury back in about 1997, I think, where he brought people from New South Wales together to talk about container deposit legislation. They were people from all different walks of life and different education levels. It was really interesting to see that the wealthy guy from Bronte said that 10¢ should be enough for a deposit, whereas the young unemployed woman with two children said it has to be more to make it worth going all the way to return the bottles. If you have a proper return system, you're returning clean, sorted products.

ALEXANDRA BARRATT: I think the writing's on the wall that we need to move towards a zero-waste approach. The question is just how rapidly do we do it. I'm just mindful of the fact that in her research, Cathy was telling us that many of these countries overseas that have installed incinerators have signed 40- and 50-year contracts. The problem with that is that, at the same time, their societies have been moving towards zero waste. They now actually don't have enough waste to feed into the incinerator. I guess that's another pitfall or trap to avoid with the incinerators. If we're going to go to zero waste, we might as well get our skates on and get there faster.

CATHY GILL: The main focus of the terms of this inquiry seemed to speak to me that let's see about maybe landfill versus energy-to-waste technology. Down the line is what else is out there? Just the research that our little group of nannas, great researchers that we are—there's a lot more out there to learn and to find from these cities that are well on their way. I would ask this inquiry to open this widely to look at fully cost effective—as we saw in the last session, where is this really toxic waste going to go? "Oh," says the scientist—sorry, I shouldn't speak like that—"just send it off to the toxic waste dump." "Do we have them?" "Not really."

What happens in the toxic waste dump? What are we creating for the future? That is called a hierarchy. There are places that have moved up the hierarchy. There's a lot out there that we can learn. This inquiry has not really reached out to that kind of expertise. I would really ask the inquiry to commission greater research on the

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cities that have made the most progress towards zero waste. The toxic waste—we heard about how it's got to arrive. We know, even if things are put in tailings dams, they have a way of breaking down. They all break down in the end.

The Hon. EMILY SUVAAL: I think also, in the end, you are dealing with, ultimately, human behaviour. For the single woman with the two children who thought that there wasn't enough of an incentive to return the container deposit, will there be a sufficient incentive within this? We're dealing with human beings. What I'm also concerned about is a scenario in which we run out of landfill, and we haven't adopted—this zero waste in 10 years is obviously looking at 2030, which is not 10 years away, it's 3½ years away, and counting. We're trying to avoid a scenario where quite literally people's red bins can't get picked up from the side of the road. If that is a scenario that we're faced with, what do we do then?

KEELAH LAM: I would like to give the example of Sweden. They have the best whiz-bang waste-to-energy incinerator, and they can heat buildings with this—the railway station and what have you. But Sweden has introduced tax relief for people who get things repaired and tax relief for the repairers. They have moved, in a short time, so far that they don't have enough garbage to feed the greedy beasts. So what do they do? It's just, to me, incredible. They have to import waste from England to burn in their stupid incinerator because of the contract they have. Denmark has closed some incinerators. If they can do it in that short time, I think we can also do it. We don't want to be negative about the solution, because the zero waste solution is the only solution that we should be looking at. We don't want to invest money in something that is going to cause more trouble, and it's not cheap to build incinerators.

The Hon. EMILY SUVAAL: No.

CATHY GILL: And to sign those contracts and to contract future generations to those costs, and to include all the costs, and the madness, really—let's face it—of trucking or sending on the train hundreds of kilometres more waste, to include that in the embedded cost and carbon that's happening. I realise it's like, "Oh my God, three years." We're on the train heading to the brick wall. But is it the smartest thing to go, "Okay, look, here comes an industry. We'll just sign it over to them"? That seems easy, but what really are you doing? We're in a panic. They come along with a proposal, but really it's an industry by a major corporation overseas who are spruiking their goods in the Third World—all over the world—giving their own answers, as we saw, "Oh, we can just put the toxic waste in the cement blocks," and it's like, "Yes, well, don't cement blocks break down after time?"

KEELAH LAM: The economics of zero waste has to be better, and the sustainability is better. It's a no-brainer that we that we go for zero waste, that we do everything we can to move quickly towards zero waste. That will solve a lot of problems to our grandchildren and theirs, because they're going to have enough problems dealing with the climate change, with the increased temperature. I mean, what they're looking at is so scary. We could do this now. We don't have to wait, and we don't have to leave the legacy of toxic ash.

CATHY GILL: I'd like to give you another link to a United Nations Environment Programme conference a couple of years ago, where the presenter said to continue on the trajectory the world is on will cost—I haven't got the figure in my mind—in the \$600 billion mark. To move to the circular economy, which we do have the ways of doing would cause the saving of not only that cost, but saving on the other side of the balance of another \$100 billion, \$108 billion. When you factor in all those costs, so many of those costs don't have a dollar sign on them. People's health, the environment, those things don't come up in dollar terms. They're invaluable.

The Hon. MARK BANASIAK: One question from me, and we'll see how we go depending on the answer. State governments of all persuasions in the past have gone for the easy option and often tried to just ram through the easy option. They slap a State significant development label on a project and you're 90 per cent on the way to getting green-lit. Do you think if they went down that path that the EPA is trusted enough, based on their track history, to regulate the energy-to-waste industry as it stands? I know you don't want—

KEELAH LAM: Can you repeat the question, please?

The Hon. MARK BANASIAK: Do you have enough faith and trust in the EPA as the current regulator to properly regulate an energy-to-waste industry—noting that you don't want one, but also noting that governments have a way of ramming through things that are easy?

KEELAH LAM: No. All over the world, people are waking up to the fact that it's not properly regulated, it is dangerous and they don't want it. Nobody wants an incinerator, but very few people are giving the solution. We are aiming to give this solution. You can talk all you like about wanting to stop something but, if you've got a solution that is available, that is what we need to do.

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The Hon. MARK BANASIAK: When you say all over the world people are waking up, are they waking up to the fact that the regulator in those jurisdictions is failing to properly regulate, or are they just waking up to the fact that these things are inherently risky in terms of human health and environment?

KEELAH LAM: I think from all the experiences that we're having with all the environmental damage, we are waking up to the regulator not doing the right thing.

CATHY GILL: And, I think, the regulator not having the right laws to work within. It's probably another whole topic, but it appears that the EPA when they stand up to a proposed industry, even if it gets appealed in court, then go back to the industry and try to help them—find them ways to get around the laws.

The Hon. MARK BANASIAK: From what I've seen of their behaviour in Tarago, they haven't been standing up at all. If anything, they've been quite complicit.

CATHY GILL: The EPA?

The Hon. MARK BANASIAK: Yes, in encouraging bad behaviour from that proponent.

KEELAH LAM: Maybe we should stop political donations.

CATHY GILL: Would it be radical to say it would be wonderful to have a fully, totally independent EPA, independent of government?

The Hon. MARK BANASIAK: You're looking like you want to jump in and perhaps say something.

ALEXANDRA BARRATT: No, I think Cathy's doing great. I've got something to add, but—

CATHY GILL: I'm done.

ALEXANDRA BARRATT: I'm not quite sure where your question is coming from, but I can contribute this. When I was reading the literature, there have been new standards in Europe since 2018. They're called best technology something or other. The manufacturers say this means that the newest incinerators are going to be better. Given my 30-plus years experience in public health, I would caution against believing that. Just because something is less harmful doesn't mean that it's actually safe. It may be true that the newest incinerators don't emit as much of the known toxins as the older ones. That doesn't mean that the small amount of known toxins can't still cause damage. It also doesn't mean that there aren't new toxins that have never been appreciated before, or that even didn't exist before because they're new chemicals.

To give an example, they told us that vapes would be safer than cigarettes. It turns out vapes are not safe. Granted, they may be a bit less harmful than cigarettes, but it turns out they have their own risks and diseases that they cause, which was not known at the time. We just don't know. We can't say that the newest incinerators are going to be safe. They may turn out to be safe. They may turn out to be a source of some new chemical or some new exposure disease association that's never been found before. So I guess I would just say, even if you can trust the regulator, all they can do is get companies to adhere to the standards. But the safest thing is not to emit that pollution in the first place.

CATHY GILL: I would just say too that, from hearing this morning, Madam Chair, if that's the right term, you alluded to there being 25,000 tonnes per year of this ash.

The CHAIR: Just from Parkes.

CATHY GILL: We were speaking to ABC radio this morning and our colleague was an engineer and he said it's 30 per cent of the waste—so the waste goes in and 30 per cent comes out and it's toxic ash. I mean, it's not good.

Dr AMANDA COHN: I will follow up from Mr Banasiak's questions to Professor Barratt. In terms of establishing the evidence that an incinerator may or may not cause health effects, for these new supposed best practice incinerators that are being built in overseas jurisdictions, if they were causing measurable harms to human health, what would need to be done to establish that link and how long would that take?

ALEXANDRA BARRATT: I think there are two harms that have emerged from the literature so far. The first is around reproductive harms. That would be relatively quick because you get exposure and outcome in a number of years. The other ones that are to do with cancers—that's obviously going to take much, much longer, and heart disease, respiratory disease, the same. It's going to take decades before we see whether those exposures cause those diseases. If this has to go ahead—and I really hope that it doesn't because I think it's a terrible idea, but if it does—then it would be wise to build in evaluation around it, to measure exposures around it and to measure health outcomes around it, to do it as an opportunity to add to the world's knowledge. That is not a reason for doing it, can I be really clear? I really don't think it should happen. With my years of public health experience,

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I think this is a terrible idea and it should not happen. But if it did, then that would be a way that we might be able to find out some more of that information. But it will take a long time, either here or in other sites overseas, for that information to emerge.

Dr AMANDA COHN: Just to clarify for these new supposedly best-practice or new-standard incinerators, am I right in interpreting what you're saying that we shouldn't be reassured by proponents saying there's no evidence of health risks associated with those incinerators?

ALEXANDRA BARRATT: Correct, because no evidence of harm is not the same as evidence of safety.

The Hon. MARK BANASIAK: Would it be a reasonable comparison in terms of those public health risks, in terms of not knowing what may come down the line in terms of cancers? Is it like what we're now seeing with firefighters and the involvement in terms of the cancers that they're contracting because of all the new chemicals that they're potentially breathing in when they go in to fight fires? Would we potentially see something like that evolving down the track?

ALEXANDRA BARRATT: I don't have my crystal ball with me, but yes, I think that's a real possibility.

The Hon. MARK BANASIAK: To make another comparison, we may find ourselves having to have a David versus Goliath fight with an international company like we had with the James Hardie asbestos incident.

CATHY GILL: Yes.

ALEXANDRA BARRATT: Yes, it's definitely a possibility.

CATHY GILL: Could I say some of us attended a launch in the other parliamentary room by a group called Future Sooner. That's a group of people who have lived in the vicinity of our current coal-fired power stations and the research that they've done on the cancer clusters all around their area. Some of our parliamentarians might have spoken to them because at that meeting there were parliamentarians and there were a lot of doctors that spoke too. They are trying to get awareness. I think they're even considering class action at the number of cancer clusters. It's taken this long from them getting the ash and the pollution from those coal-fired power stations for that evidence to fully emerge, so yes.

The CHAIR: Thank you all. Our time is up. I did have a couple of questions. I'll just finish very quickly on one to each of you to wrap it up. You're not saying just no to energy-from-waste facilities in the regions, you're saying no anywhere?

KEELAH LAM: Yes.

The CHAIR: Thank you all very much. We do have the information that you have tendered here. Do you want that kept confidential or are you happy to have that published?

ALEXANDRA BARRATT: The document about the zero waste in 10 years, that's fine.

KEELAH LAM: That's public anyway.

ALEXANDRA BARRATT: The other one that is just my personal assessment of the health literature based on my professional experience, I'd rather keep that confidential for the Committee only.

The CHAIR: That's fine. That's noted, thank you. Thank you all for attending and for your evidence. I think Dr Cohn did request some information, so the secretariat will be in touch in order to obtain that from you. Thank you for coming along.

(The witnesses withdrew.)

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Mr CHRIS RITCHIE, Executive Director, Energy, Resources and Industry Assessments, Department of Planning, Housing and Infrastructure, affirmed and examined

The CHAIR: Welcome and thank you for making the time to give evidence today. Do you have a short opening statement?

CHRIS RITCHIE: I do. Thank you for the opportunity to appear today. I thought it might assist the Committee if I briefly outline the role the Department of Planning, Housing and Infrastructure has in energy from waste. While the department is responsible for setting the policy and strategic framework for planning and development across the State in areas such as housing, we do not set the strategic framework for energy from waste. Our role is to assess proposals against the energy-from-waste strategic frameworks set by the Government and the policy framework developed by the New South Wales Environment Protection Authority. We have been doing this since the release of the Energy from Waste Policy Statement in 2015. Since then, the department has been involved in the assessment of several energy-from-waste proposals in New South Wales. This includes the current proposal by Veolia at Woodlawn, near Tarago. Our team has extensive experience in assessing complex industrial proposals and in coordinating and balancing the advice received from multiple key stakeholders to ensure key issues are appropriately identified and assessed in a timely manner.

In the case of energy-from-waste projects, we work closely with the EPA and NSW Health to consider air quality and human health risk, and will take advice also from the Department of Primary Industries and Regional Development on matters relating to agricultural risk. As energy-from-waste technology is new to New South Wales, we also engage independent experts to provide advice to assist with our assessment. These experts have experience in energy from waste in both Australia and Europe, as well as expertise in human health and agricultural risk. As part of their application, applicants must demonstrate the performance of that technology by selecting an operational energy-from-waste plant that we can use as a point of reference.

That reference facility must also use the same technologies and the same waste feedstock as the proposal and be in a similar jurisdiction. The applicant must use current operational emissions data from that working facility to help us understand the air quality and human health impacts from a proposed facility. We expect them to use technologies that are consistent with global best practice and, noting the life of these types of facilities can be in the order of 25 years, we also expect the applicants to commit to continual improvement with respect to emission control techniques and practices. As you know, we currently have two active energy-from-waste proposals in New South Wales. Both are State significant proposals. The department is currently assessing the proposal by Veolia at the Woodlawn Eco Precinct near Tarago. As this is an active assessment, I am unable to comment on our views of this proposal at this time. In relation to the Parkes proposed energy-from-waste proposal, this is at the early stages of the planning process, and a DA has not been lodged at this stage. We therefore have limited details on the proposal at this time.

We have, however, issued a rigorous set of assessment requirements which cover about 30 key issues, including matters relating to air quality, human health and agricultural risk, transport, amenity, and social and economic impacts. We recognise there's been a lot of community concern about the Parkes energy-from-waste proposal and that people have lots of questions. This week, Thursday 7 May, we will be holding community information sessions in Parkes where people can drop in and learn more about the assessment process for an energy-from-waste project. Our goal is to make sure the local community understands exactly how this project will be assessed, including what expert advice feeds into that assessment from both government agencies and independent experts, and, most importantly, when and how the community can have their say. The department's role in this process is clear. We will assess the project on its merits, as we do with other SSD applications. I'm happy to take any questions that you may have.

The Hon. MARK BANASIAK: I know you said you can't talk in any great detail about any of the two specific proposals, but can you tell us in your department's assessment and research whether you've heard the same evidence we have in that grain buyers may reject produce from areas that have been farmed near these facilities? Have you heard that same concern and same evidence?

CHRIS RITCHIE: Going to the Woodlawn proposal, and even Parkes, in terms of setting a framework for the assessment requirements for those applications, agricultural risk is one of the key issues that we have asked applicants to address. In relation to the Woodlawn proposal, we also went out and visited some landowners and farming associations and we certainly heard concerns around what it means for their operation, what it means for particularly how they've got to have certification and those sorts of things. In terms of rejection of produce, we haven't heard that to that extent. There's certainly concerns around what it means for farming businesses' certification for produce through domestic and international exports et cetera, but certainly not in terms of things

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being rejected. It's something we've picked up as a key issue and certainly things that our independent experts will also be looking at when we get in the details of those assessments.

The Hon. MARK BANASIAK: What were they specifically telling you about certification for overseas markets in the Woodlawn—

CHRIS RITCHIE: There was just a concern that it could affect their produce, just as a general consensus but not as a specific issue.

The Hon. MARK BANASIAK: Can you point us to any publicly available assessment that has been done that justifies or does some sort of needs assessment that justifies why these particular areas and not other areas? Why Parkes, why Woodlawn, why Tarago and not anywhere else? We heard from one of the proponents, "They're safe everywhere." We could have one next door to us at our house in Sydney or Illawarra. "They're safe everywhere." Has your department done and is there any publicly available needs assessment that says, "It's best placed to go in Parkes," or "It's best placed to go in Tarago"?

CHRIS RITCHIE: The decision on where the four precincts are located was a decision by the Government. We just assessed the proposals on their merits, in terms of should they proceed to an application. But in terms of those site selections, that was something of the Government, not something that we were directly—

The Hon. MARK BANASIAK: Your department has never been privy to why those sites were chosen?

CHRIS RITCHIE: That was a government process. But certainly going to the Parkes SAP—I can get some more details around that—in 2019 there were some early strategic and master plan works where there was the potential site identified. There were no particular details around the proposal at that location. I understand that that process was notified. There were some consultations around it. There were some indications in that early SAP framework, but nothing which described the actual proposal, the size of the proposal or anything like that.

The Hon. MARK BANASIAK: But isn't that something that would assist your department in making assessments—knowing why locations were chosen and why they may be more suitable than others? Wouldn't that be something useful for your department to have in terms of making the overall assessment as to whether that project goes ahead? Wouldn't it better inform your decision if you knew why the Government was so insistent on offering up those locations rather than other locations?

CHRIS RITCHIE: Again, in terms of those four locations, that was a decision by the Government. In terms of how the policy setting is now, my role is to assess those from an assessment perspective.

The Hon. MARK BANASIAK: I accept that evidence, but I'm just pressing you a bit: Wouldn't knowing how those decisions were made or why those decisions were made help you in your assessment process?

CHRIS RITCHIE: From where I sit, the assessment is more around the actual application itself—the framework of the assessment that we ask applications to address. I independently assess that on its merits and then make a recommendation and conclusion around that. But the two we've got, one is lodged but has been on hold for a little while, and the Parkes one hasn't commenced. It has only got SEARs at this stage. But in terms of the decision, that's not something that I or the department—in the context of the four within the policy—were involved in.

The Hon. MARK BANASIAK: As part of your assessment, are you looking at potential long-term contamination risks over time? Is that something that you are including in your assessment?

CHRIS RITCHIE: One of the paths of assessment is around the potential human health risk assessments. We have what's called an ecotoxicological expert that helps us out with our assessments. In terms of impacts, as I mentioned, to agricultural activities, to water supply, to farming practices and to human health, these are all issues that we assess as part of the consideration of these applications.

The Hon. MARK BANASIAK: With a lot of other large-scale industrial infrastructure, like mines and like renewable energy, that have a finite time in terms of operation, are you looking at imposing decommissioning bonds or requirements on proponents as part of the assessment proposal?

CHRIS RITCHIE: In terms of the assessments at the moment, for the Woodlawn proposal we're waiting on the response to submissions. Once we get that, we'll look at the issues that have been raised in the submissions et cetera in a lot of detail. At this point in time I can't comment on that, but our assessment will consider the raft of issues raised in submissions and will consider potential impacts. I'll take advice from other government agencies and our experts that we use in these assessments.

Dr AMANDA COHN: Following up on that last question regarding the process down at Woodlawn, I know you can't speak to the department's views on the proposal, but in terms of the process, I understand you've

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been waiting for a response to submissions for some time now. Is there a time limit on that? Or does the proponent have unlimited time?

CHRIS RITCHIE: The Woodlawn proposal was exhibited between October and December 2022. There was a really large community response to that—there were over 600 submissions. Equally, there were a lot of issues raised by the department, other government agencies and the experts that we use when we assess these proposals. The applicant has advised that they wanted to do more engagement, more consultation. There are actually also some changes that they wanted to do to that proposal. When you look at energy from waste, it generates two types of ash streams. There's what's called bottom ash that falls out the bottom of the incinerating process, and then what's captured in the air pollution control residue, which is a little bit more contaminated or higher in levels of things.

The applicant has sought to change the original way that that air pollution control residue was going to be managed. Originally it was going to be landfilled in a cell at the Woodlawn facility, but they're looking to look at opportunities to also make changes to declassify or stabilise that material to allow it to be disposed of at either a restricted or a general solid-waste category. To do that has meant they need to amend the proposal and make some changes to their assessment. What they're also looking to do is update their assessment in line with what the EPA are updating in terms of the Energy from Waste Policy Statement. The latest information we have is that's coming in September this year.

Dr AMANDA COHN: Given that it sounds like substantive changes are being made to that proposal, does that then trigger reassessment by government agencies or another public exhibition period?

CHRIS RITCHIE: Technically, at this stage, it requires an amendment to the proposal. We will be re-notifying that amendment and seeking additional comments in response to that amendment, but also how the applicant has responded to the issues raised in submissions.

Dr AMANDA COHN: I have another, much broader, question. We had some evidence this morning around the benefits of a life cycle assessment approach. I wonder how that fits in with the way the department assesses proposals?

CHRIS RITCHIE: That was actually recommendation from—I think it was—a 2018 inquiry. It is a requirement that we have in our SEARs, and it is something that forms part of our assessment of these proposals.

The CHAIR: The department had requested in writing to the Committee to come and appear at one of our hearings. Was that about telling us that you don't set the strategic framework for energy from waste and that you're just assessing it? Is that the whole reason why you wanted to appear?

CHRIS RITCHIE: The reason why I wanted to appear is more to inform the way in which we assess proposals for energy from waste. I think I want to make it clear that we have a particular setting by which we assess those proposals. That's under the Energy from Waste Framework. There are emission standards that also apply, but they are set by the EPA, is what I want to make clear. When we are assessing these proposals, we consult closely with the likes of the EPA. It's probably worth stepping back a bit. When we do assess these proposals, we do utilise a lot of independent expertise, and a lot of those experts have experience in energy from waste. I do want to have the opportunity to explain that to the Committee as well.

When we do assess these with government agencies, it's actually done in a very holistic and collaborative manner. When we're assessing these proposals, particularly with NSW Health, the EPA and the primary industries department, we're doing that together with those experts, because we think it's important that that is understood as a whole in terms of these key issues, being how an energy-from-waste facility operates, what are the potential air emissions and what are the potential outputs that we need to consider from the health impact or an agricultural impact. When we do look at these, it's very much a combined end-to-end assessment, which we do together to make sure that the various experts and agencies are able to hear and listen and ask questions as part of that assessment.

The Hon. MARK BANASIAK: For clarification, how is that process any different to the standard planning process where you have a SEARs, you ask the departments "What do you reckon?" and they come back and say, "We've got these concerns"? You put that to the developer or the proponent, then the developer or proponent comes up with ways that they're going to navigate those concerns. Is it in any way different to the normal planning assessment process?

CHRIS RITCHIE: I think there are a couple of differences, just to point out. So one is all proposals, we issue assessment requirements or SEARs—Secretary's environmental assessment requirements. Proposals prepare an EIS. We do consult key agencies as part of our assessment. What's a little bit different here—but we do do it

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sometimes with some technically complex projects like this—is in this instance we hired and engaged a range of independent experts.

Then, when we're assessing the proposal, what I'm suggesting or saying is that we do that together, so we'll meet together. When we're going through the response or going through key issues around whether it's air emissions or human health, the experts and those agencies are actually in a meeting or a room together where the front end of how the proposal operates, the EPA and Health are hearing that. They can ask questions because that will talk to what they need to be considering, and what they need to be satisfied of. So it's a little bit different to the normal situation. It's probably the most engaged and intense way in which we will assess something like this.

The CHAIR: With this holistic approach that you've just been discussing and crossover with all of these other departments, EPA et cetera, how far along in the assessment process are you for these particular projects with that holistic overview and consultation with the groups thus far?

CHRIS RITCHIE: Noting that Woodlawn is the proposal that's come in and it has been exhibited, I'd have to come back to you with some details, but there would have been some discussions and there were three items of questions that we've asked back to the company Veolia on that. One was: We've got all these submissions that have come in; you need to respond to those. Then there was advice and information that we obtained from our experts. That went as a separate correspondence. Then, thirdly, we'd gone out after the exhibition and met a number of different landholders—the preschool, an agricultural association that was representative of a number of farmers in the area and the viticulture group as well. We met them at one of their sites. Following that was a third lot of correspondence that we sent back to Veolia to address. We're waiting on that response to come in. Once it does come in, we'll then proceed to continue with that assessment and engagement approach that we take.

The CHAIR: But the communities are saying that there's been—in their view—little to no engagement and consultation. You're suggesting that there has been.

CHRIS RITCHIE: We went out in—I think it was March 2023. That was on the back of the exhibition because we'd sensed there was a lot of community response, so we went out to have a more face-to-face meeting with some of those submitters and people that had raised some concerns. There has been correspondence in, but we haven't gone back and had another round of engagement.

The CHAIR: So there hasn't been anything since March 2023?

CHRIS RITCHIE: Not from ourselves, but certainly there's been correspondence or some discussions here and there. When the response does come in, we will seek to go back out and engage with the communities again.

The CHAIR: That would be the normal process in terms of your timing and the assessment criteria—that you would wait for the submissions and then go back and have that more extensive community consultation? You're talking now about holding this community session in Parkes on 7 May. Is that the normal timing?

CHRIS RITCHIE: Parkes is a different process, but staying on Woodlawn, what the applicant is actually doing is responding to every individual submission that's come in. Once that response comes in, the community—or submitters—will then review that. Then we will come in behind that and have another discussion with the community because then that gets us to understand how the submitters feel like their issues have been responded to. Do they have more issues to raise? Is there anything else they need to be clarified or other questions that they've got, particularly in terms of how the process rolls from here or what other information they think they need? Then going to Parkes, the SEARs were issued in March this year. We are in information sessions Thursday 7 May.

We've got a venue booked from 12.00 p.m. to 7.00 p.m. to allow, again, anyone in the community to come and ask us any questions to understand what the process is like—where we're at in the process, how we go about assessing these particular proposals—where we talk about the experts that we engage, probably to clarify the different role of different agencies, just to sort of make that clear, and talk about aspects of the policy, like, "What is a reference facility about? What does that mean?" There's also information that people can take home if they come to the session. There's also, for both, updated information on our website that helps with clarifying energy-from-waste proposals, what are the key issues and how we assess them.

The CHAIR: I'm making a note of that. Coming back to Mr Banasiak's line of questioning, I understand that it's outside your purview, but when it comes to the selection of the sites, apparently no-one can give us any reasoning or basis on how they've been selected. Does your assessment process take into account specifics around those sites? We talked about an agricultural assessment et cetera. Do you look outside the social licence of whether a community wants it there or not? Does your assessment process take into account, "Actually, this site, from geography or whatever, isn't suitable to host a facility of this nature"?

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CHRIS RITCHIE: We assess a proposal on its merits. That includes things like its appropriateness in terms of site selection. We look at things like potential impacts on receivers in the likes of these types of projects—that is, impacts on agricultural activities, on water supply. We consider submissions that are received. We look at the policy setting. We seek advice from key agencies, plus our independent experts, and then we weigh all those issues up under section 4.15 of the Environmental Planning and Assessment Act, and we do an assessment around that framework. Importantly, the department will do that assessment, but the decision-maker for both projects will be the Independent Planning Commission. We will do an assessment, we will do a recommendation and then we'll hand that to the Independent Planning Commission, who will then make the final decision on both projects.

The CHAIR: That's the first time that we've heard the Independent Planning Commission raised today, and it's a valid point. I go to one of the areas raised by Dr Cohn. You talked about the potential changes in having to deal with—and I think we're all very aware of bottom ash and fly-ash and the sorts of tonnage that we're talking about from Parkes alone, which I have raised today. You suggested that the proponents are looking to have that dealt with, or addressed, or change the parameters around that. Is that what you were suggesting?

CHRIS RITCHIE: The original proposal for Woodlawn was to dispose of that air pollution control residue into what you call a mono cell or a cell within a cell within the Woodlawn facility. What they're looking to do is to basically stabilise and declassify that material to allow—

The CHAIR: When you say "declassify", declassify it from what?

CHRIS RITCHIE: I'll explain it, sorry.

The CHAIR: If we're talking about the fact that fly-ash is considered a hazardous material, if you're saying "declassify" it—

CHRIS RITCHIE: There are three classifications. There's hazardous waste, restricted waste, general solid waste. General solid waste is normal landfill, so you can dispose of it in a normal landfill. In terms of restricted waste, there's only one landfill at the moment that takes restricted waste.

The CHAIR: Where is that?

CHRIS RITCHIE: That is at Kemps Creek. Hazardous waste is its own category. To stabilise it—and it's not unusual in a lot of waste operations—you can mix it with materials, or you can use concrete or additives to reduce its classification. They potentially could reduce it to restricted or potentially come down to general. This is what we're looking for—the addition information. This is what they're seeking to do as part of that amendment.

The CHAIR: They want to take it from hazardous waste to restricted waste, and that will form—

CHRIS RITCHIE: And potentially to general, so that's what we're looking at.

The CHAIR: Potentially to general—goodness me. When it comes to Kemps Creek, does your assessment process again then have to extend out to look at the potential tonnage that's being generated and, if it does remain hazardous—sorry, restricted, if that's Kemps Creek—how that then impacts on that facility, which the EPA has also said is almost at its capacity? Do you look at all of those factors as well?

CHRIS RITCHIE: A facility like Kemps Creek that might be receiving restricted waste will operate under its own approval. It has approval to accept restricted waste, so the material would need to be consistent with that consent. Lots of different facilities take waste to Kemps Creek. I'm not sure how long it's been in operation—it's been in operation for a while—but that consent operates on its own accord and has to be considered in terms of its ability to take that material. This is what's all been explained in the amended application. These are the issues that we will look at once we receive that.

The CHAIR: And that amended application, is that public?

CHRIS RITCHIE: Once we receive it, it will be made publicly available, and we're likely to probably exhibit that again.

The CHAIR: I just lost my track there—coming back to changing the potential categorisation of it. It's gone from me now. I should have stuck to that—

CHRIS RITCHIE: Just to advise the Committee, it's not unusual in the waste space to look to declassify waste streams.

The CHAIR: Now I know what the question was. If you say that it's relatively standard to change the classifications, what about the distance? Whether it's hazardous or whether it's restricted—let alone we won't even be talking about general. Given the travel distances and the other witnesses that we've heard from today, including

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the chief scientist, suggesting that it is better addressed closer to the source—again, travel, distances, whether it's road or whether it's rail. Does all of that factor into your assessment processes as well?

CHRIS RITCHIE: The key thing about Kemps Creek is that it takes waste from all over New South Wales. But I think that what Veolia is probably seeking to do is send it to a general solid waste category. That just means it can go into its adjacent Woodlawn landfill. But if there are additional traffic movements or a rail movement, that will be factored in as part of our assessment of a proposal because it's an additional activity.

The CHAIR: On that, is the additional activity for the rail movements, which will be necessary just to send the waste to places like—well, if Veolia is now going to be 380,000, 700,000 for Parkes. Those additional rail movements are also taken into account in your assessment process.

CHRIS RITCHIE: Going to Woodlawn, Woodlawn utilises two transfer facilities: one at Banksmeadow, which was approved in about 2015, and one at Clyde, which was approved in about 2003. They have existing consent so, if there are changes, it's a matter of is that operating in accordance with that consent? If there are changes, we'll have to look at that.

The CHAIR: But obviously there would be changes with additional tonnage.

CHRIS RITCHIE: Yes, but the thing with Woodlawn is that it's receiving, I think, a million tonnes by rail now. That's existing waste that's going to the site. It's being dealt with on the site. There might be an additional carriage—I'd have to check that—but there are already large waste volumes that are being transferred down to the facility. Going to Parkes now, there is going to be a separate application for, likely, a transfer facility to send the material to Parkes. That is going to be subject to a separate application. The process for that hasn't quite commenced, but we'll have to get information around that aspect. It will then receive its own set of assessment requirements, and it will be assessed as part of a separate SSD application.

The CHAIR: That would be have to be provided by the proponent as part of their development for the facility, not the Government.

CHRIS RITCHIE: Yes, there'll be two separate applications.

Dr AMANDA COHN: You mentioned that there are discussions about a transfer facility and that that proposal is not in yet. Are you able to tell us what suburb that transfer facility is proposed to be in?

CHRIS RITCHIE: I don't know those details yet, at this stage. Once we receive information and there are SEARs—or Secretary's environmental assessment requirements—issued, then that will be made publicly available.

The Hon. MARK BANASIAK: Just one clarification, in terms of going back to Woodlawn: You talked about the transfer stations that are already approved. What would trigger a reassessment of that? Would an increase in tonnage going through them be enough to trigger a reassessment, or would it have to be a more substantial change to the process for it to be reassessed?

CHRIS RITCHIE: It probably depends on the nature of the change.

The Hon. MARK BANASIAK: Would an increase in tonnage be enough to trigger a reassessment?

CHRIS RITCHIE: Potentially, you could modify those. There are different assessment pathways. You've got a brand-new application DA or there's opportunities to modify through variations to the current approval.

The Hon. MARK BANASIAK: Would that be more of a modification or a variation?

CHRIS RITCHIE: If there was any change, it's probably more likely to be a modification, because the million tonnes is quite high. I think Woodlawn is about 380,000 tonnes per annum, so I think it's using a lot of existing waste rooms.

The CHAIR: I have one final one before I hand over to Ms Suvaal. Again, coming back to the idea of the hazardous and the restricted waste, there is some suggestion about, and some of the submissions pointed out, the potential need for an additional facility. Let's just say that it remains as hazardous or even becomes restricted. An additional facility on top of the EFW facility, closer to where they're potentially going to be, to address that residual waste—would that have to be something that is an entirely separate process? Would that come under an SSD in your assessment process, to say that it is going to remain hazardous and more needs to be done?

CHRIS RITCHIE: There are separate SSD triggers for waste facilities generally—landfilling, resource recovery or recycling. There are tonnage triggers. In terms of restricted waste, there's also another proposal that's seeking to, as part of an expansion, add some restricted waste cells. In addition to Kemps Creek, there is a second proposal that's in the early stages as well.

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The CHAIR: That is separate from the current sites that we're talking about and the current proponents we're talking about?

CHRIS RITCHIE: Yes, they are separate. My understanding is, again, they're trying to get to the general solid waste to use the cell. Either way, the amendment report will need to describe how they're achieving whatever reduction they're seeking to go to and how they're looking to manage that and transfer. Where is that material going? These are things that will have to come out in that amendment, which we're expecting to get in September.

The Hon. EMILY SUVAAL: Thank you for your evidence today. Could you perhaps, for the benefit of Committee members, step out the community consultation process as it pertains to these energy-from-waste projects?

CHRIS RITCHIE: When we issue those assessment requirements, often one of the first issues is the requirement around good, genuine, proper engagement. Our expectation is the applicant is doing a lot of that engagement, and we want that engagement to be genuine, proportionate and clear in terms of describing what the proposal is, because these matters can get quite complex. The key for us is that it's ongoing, so it's early in the process and then during the course of an assessment process. We have departmental policies and guidelines around that, that spell out how that's done. Then, through the course of our assessment, as I've mentioned for Woodlawn, we noticed there were lots of submissions, so we have gone ourselves and done some engagement.

Equally for Parkes, there's already lots of interest and questions from the Parkes community, so we've got those sessions coming this week. We will probably do that again during the course of when the application comes in. Equally, the applicant will also start really increasing their engagement once their application comes in for Parkes. For us, the engagement, again, has to be ongoing. It has to be genuine; it has to be proportionate. As I mentioned, it has to have available the requisite information so the community are informed. When an application comes in, we will then let people know and we will seek comments. The process under our assessment pathway is very transparent. There's lots of information on the website for both the Parkes and Woodlawn proposals. There is a lot of information on a dedicated landing page, which has lots of FAQs and information that the community can have access to.

The Hon. EMILY SUVAAL: In terms of the department's approach, or at least way of being able to measure or gauge what that engagement has been like by a proponent, you mentioned guidelines, but how do you test or measure that?

CHRIS RITCHIE: When an application is put together, they have to describe what engagement process they followed and the response to what was raised. That might mean more information was provided, more community information sessions were held or there were changes to the proposal. Equally, as recent as yesterday, we've spoken to the applicant about that engagement. We will, at key points, discuss how that is tracking. Then, when an application is put together, we do a bit of a review of an application before we make it publicly available. We call that an adequacy check. We'll be looking at things like did you do the engagement and is there enough information here to make that available. So there are a couple of checkpoints through the course of that process.

The Hon. EMILY SUVAAL: How do you test that the engagement that they have done is thorough? They haven't said they've held a one-hour meeting at 9.00 a.m. on a weekday in the middle of nowhere. How are you able to test that objectively to make sure they've been doing it?

CHRIS RITCHIE: The application should spell that out, and then we will be checking that against our guidelines as part of our assessment of the proposal. There have been occasions on other types of projects where we've encouraged the applicant to do more through the course of an exhibition process or post-exhibition.

The Hon. EMILY SUVAAL: That was my next question.

CHRIS RITCHIE: Again, that's something that we occasionally do as well. But the key is getting that information, going through that, evaluating what's been done, checking that against our guidelines, and then going from there.

The Hon. EMILY SUVAAL: So the department does have the ability to say, "Hey, you've done X consultation. That's not going to be sufficient. As per the guidelines, we recommend you go back and do something else." You do have the ability to do that?

CHRIS RITCHIE: Correct, yes.

The CHAIR: Thank you very much, Mr Ritchie. We appreciate your time and your evidence. If we took anything on notice, the secretariat will be in touch.

**(The witness withdrew.)
The Committee adjourned at 15:15.**