T R A N S C R I P T

LEGISLATIVE COUNCIL ECONOMY AND INFRASTRUCTURE COMMITTEE

The Development and Expansion of Waste-to-Energy (WtE) Infrastructure in Victoria

Sunbury – Thursday 7 May 2026

MEMBERS

Georgie Purcell – Chair
Richard Welch – Deputy Chair
John Berger
Gaelle Broad
Katherine Copsey
Moira Deeming
Tom McIntosh
Evan Mulholland
Sonja Terpstra

WITNESSES

Jane Bremmer, Chair, and

Lee Bell, Toxics Free Australia;

Arabella Daniel *(via videoconference)*, Clean Air Communities; and

Pauline Galvin, Treasurer, Climate Action Merri-bek.

The CHAIR: I declare open the Legislative Council Economy and Infrastructure Committee's public hearing for the Inquiry into the Development and Expansion of Waste-to-Energy Infrastructure in Victoria. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we are gathered on today, and pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the broadcast of these proceedings. I also welcome any other members of the public watching via the live broadcast and in the public gallery.

For anyone in the public gallery that was not here for the previous session I just want to reiterate: you are more than welcome to be here today. We do not normally have such large crowds at public hearings. It is considered a formal proceeding of the Parliament, so once again, we just request that you listen and that there are no disruptions, as this could lead to the hearing being closed down.

I will call on committee members to introduce themselves. We will start with Mr Ettershank.

David ETTERSHANK: David Ettershank, Western Metropolitan Region.

The CHAIR: Georgie Purcell, Northern Victoria Region.

Gaelle BROAD: Hi. I am Gaelle Broad, Member for Northern Victoria Region.

Tom McINTOSH: Tom McIntosh, Eastern Victoria Region.

Sarah MANSFIELD: Sarah Mansfield, Member for Western Victoria.

Moira DEEMING: And Moira Deeming, Member for Western Metropolitan.

The CHAIR: Wonderful, thank you. And thank you so much for appearing before us today. All evidence taken is protected by parliamentary privilege as provided by the *Constitution Act* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during this hearing is protected by law. You are protected against any action for what you say during this hearing, but if you go elsewhere and repeat the same things, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded. You will be provided with a proof version of the transcript following the hearing, and then transcripts will ultimately be made public and posted on the committee's website.

For the Hansard record, can you please state your full name and any organisation you are appearing on behalf of. For the sake of ease, we might just start on the screen for this and then move through the room.

Arabella DANIEL: Thank you. Arabella Daniel from Clean Air Communities, and I just want to make it clear I am a councillor in Glen Eira, and I notice in the hearing schedule I have the councillor title. I am appearing here purely as a community advocate and not on behalf of council. Thank you.

The CHAIR: Wonderful. Thanks for the clarification. Pauline.

Pauline GALVIN: My name is Pauline Galvin. I am here on behalf of Climate Action Merri-bek.

Jane BREMMER: I am Jane Bremmer. I am here on behalf of Toxics Free Australia. Sorry about my voice. I will do my best.

The CHAIR: You have got the mic. It is fine.

Lee BELL: My name is Lee Bell, and I am here on behalf of Toxics Free Australia as an adviser, but I am also senior adviser to the International Pollutants Elimination Network.

The CHAIR: Thank you so much. We now welcome your opening comments. We do ask that they are kept to around 10 to 15 minutes just to ensure plenty of time for discussion and questions. I am not sure if you had coordinated between the groups how you plan on doing that, but I will hand over to you to commence.

Pauline GALVIN: Climate Action Merri-bek is a grassroots incorporated group of citizens in the municipality of Merri-bek in Melbourne's northern suburbs who have been active on climate advocacy since 2008, bringing our experience and knowledge of climate science and the need for rapid decarbonisation to address the climate emergency, especially as it applies to our own municipality but also Victoria and Australia as a whole. We do need rapid transition to a zero-carbon society to prevent severe climate change that will have a devastating effect on our lives and those of future generations, and we thank the committee for this opportunity to present to this inquiry.

Climate Action Merri-bek opposes waste-to-energy projects full stop. We note statements by Marcos Orellana, the UN special rapporteur on toxics and human rights, who visited Australia in 2023. In his end-of-mission statement one of the areas he highlighted was waste incineration, and he also noted air quality standards in Australia are less protective than for other members of the OECD:

> Waste incineration is the end of the line for fossil fuels. It reflects a linear process that is incompatible with a circular economy. Incineration imposes heavy health and other costs on local communities, and it is a significant source of greenhouse gases. It has been reported that even the most modern incinerators produce dioxins, furans and toxic ash.

We call for a reassessment of Victoria's waste-to-energy framework implementation. We call for a reassessment of the circular economy, waste reduction and recycling and waste-to-energy scheme and all attendant laws and regulations, noting current practice is based on the obsolete assumption that the alternative to incineration of waste is landfill, with its largely unrestrained emissions to atmosphere of methane from buried putrescible matter, and noting that modern practice is now very different and is rapidly evolving. We support pursuing recycling solutions and waste minimisation. We submit that every proposal for a waste management facility should be required to have an independent environment effects statement and the same for an independent health impact assessment. We ask that we ensure that the EPA actually evaluates each development proposal submitted to it rather than accepting its claims, assurances and vague assertions.

For a specific example I would like to quote something that we looked at for the Wollert facility, also known as the MERC. The proponent says:

> The Victorian waste-to-energy policy includes the requirement to demonstrate that the facility meets best practice standards. The MERC proposal has selected the three following reference facilities to inform the design and demonstrate the performance of the proposed energy recycling recovery technology.

They list three plants. We looked at the air quality monitoring and reporting to the community of those three facilities. Each of them was required to make air quality monitoring publicly available. One facility reported averages of pollutants, which will effectively mask any exceedances of permitted levels, and key pollutants such as heavy metals, mercury and dioxins were not reported at all. The second facility reported data in a way that did demonstrate that limits were exceeded, and it was not clear any action was taken in response to those exceedances. The third facility published continuous monitoring data, which is often pushed as best practice, for the day, at which point that day's results were removed and the next day's put up. A week later daily averaged results were reported, which were then removed in another week when the next week's data came up, and then that data completely disappeared. There was no opportunity for historical review or comparison. Stack emissions of those test results – the heavy metals, mercury, nitrous oxides, dioxins – were presented in a one-off report that was four years old at time of viewing. Yet we are told that this is best practice even though the data reporting is not fit for purpose. This also raises questions of what actions will be taken by the EPA when exceedances happen.

There is a requirement within the processing for a fit and proper person to be responsible for EPA licences. We ask that we ensure that that fit and proper person is an actually specified named person who can be prosecuted, an Australian citizen and resident and not just a corporation with limited liability. We ask to collect baseline data regarding both key health and environmental parameters before construction occurs of any waste management project and then periodically after construction, with analysis of data to look for statistically significant differences, and this should be considered as a permanent epidemiological study. We empower the EPA to impose a bond of substantial proportions on each project which has significant potential for harm to public health and/or the environment and the EPA to stipulate rules for drawing on the bond for emergency actions, for clean-up expenses and for compensation to communities. We ask that the EPA be forbidden from issuing a licence in the absence of social licence for any project or in defiance of community expectations.

I have some other points that I can make about climate, specifically greenhouse gas and climate issues, about which I can speak to you later, and I would like to commend to the committee the MosaicLab report of the June 2024 conference of interested persons prepared for the EPA over the Wollert proposal. This report very clearly details the issues surrounding that particular waste-to-energy proposal, but there is no reason to think that this is not applicable to other projects or that anything has changed at all.

Jane BREMMER: Arabella, would you like to go next?

Arabella DANIEL: Yes, I am happy to. Thank you. I will just let you know that I have had intermittent audio disruption, so I hope everything goes smoothly. Thank you, Chair, and thank you to the committee for the opportunity to appear today. My name is Arabella Daniel, and I am here as a community advocate with Clean Air Communities, a group focused on protecting public health from air pollution through evidence-based policy. I would like to clarify at the outset that I am not appearing in my capacity as a councillor in Glen Eira, nor speaking on behalf of council, which has made its own submission. I am here solely as a community advocate. Clean Air Communities is particularly focused on residential woodsmoke pollution, which EPA source apportionment work has identified as the single largest contributor to PM2.5 particulate pollution in metropolitan Melbourne, greater than all traffic on the road, all of industry and aviation combined. Our advocacy is guided by two core principles. The first is that there is no safe level of exposure to air pollution, particularly fine particulate matter – or PM 2.5 – especially the ultrafine range of particles. The second is a broader principle that we use frequently in our public education work and social media communications: 'StopBurningStuff.

The CHAIR: Apologies. Arabella, we are losing you in this room. Let us try again now.

Arabella DANIEL: Chair, would you like me to repeat or just continue?

The CHAIR: We do not need you to repeat – that is okay – but we will perhaps get you to also send in your opening remarks just for the gaps in the transcript. Thank you. It seems to have improved.

Arabella DANIEL: I certainly will, yes. Thank you. I was saying that we have a principle of not burning stuff. That phrase is intentionally simple, but it reflects a serious underlying reality that combustion-based systems, whether for heating, waste disposal or energy generation, create unavoidable health, climate and environmental impacts. This is highly relevant to waste-to-energy incineration. At the centre of our concern is the growing evidence that modern combustion technologies may create a misleading perception of safety when assessed only through traditional particulate mass measurements. This aspect was not discussed in our submission, so I am pleased to have the opportunity to raise it here. Emerging evidence suggests that so-called cleaner and more efficient combustion can reduce the overall mass of particulate emissions while simultaneously increasing the number of ultrafine or nano-sized particles emitted. On a domestic scale we see that happen, for example, in a modern wood heater: one study identified approximately an order-of-magnitude increase in ultrafine particle numbers despite lower particle mass emissions. Similarly, a 2020 study examining industrial and waste incineration combustion emissions downstream of modern flue gas treatment systems found that facilities could comply with particulate mass limits, but residual nanoparticles dominated emissions by particle number 'by several orders of magnitude'. This raises important questions about whether existing regulatory frameworks sufficiently capture the true health implications of combustion-based technologies such as waste-to-energy incineration. This matters because ultrafine particles are increasingly recognised as potentially significant from a health perspective, due to their ability to penetrate deeply into the lungs and enter the bloodstream, where they begin the inflammatory process leading to ill health and disease. This exposure harm is cumulative. In other words, cleaner combustion does not necessarily mean harmless combustion.

Our submission also raises concerns about environmental justice. Waste-to-energy facilities are disproportionately proposed within or near communities already experiencing higher cumulative pollution burdens and socioeconomic disadvantage. Importantly, many of these proposed facilities are also located within the Port Phillip air quality control region, which has unique meteorological and geographical characteristics that can contribute to the trapping and recirculation of air pollution within the metropolitan Melbourne basin. This means these facilities are not simply isolated local emitters. They contribute to the broader regional pollution load affecting metropolitan Melbourne.

We also fully acknowledge that Victoria faces genuine landfill constraints and growing waste pressures. However, our submission argues that the solution is not to replace one disposal pathway with another but to prioritise a systems-based circular economy approach focused on waste avoidance and reduction; organics diversion; anaerobic digestion for appropriate streams; stronger recycling and resource recovery; and product stewardship, repair and reuse. These approaches reduce landfill dependence while preserving material value and minimising environmental harm.

In conclusion, our concern is that waste-to-energy represents a high-risk and long-term combustion pathway that is inconsistent with Victoria's public health, climate and circular economy objectives. We recommend that waste-to-energy be avoided and that policy settings prioritise approaches that reduce waste generation, maximise resource recovery and protect community health. Thank you, and I welcome your questions.

The CHAIR: Thank you very much. Thanks, Jane.

Jane BREMMER: I am going to be a little bit more targeted and off the cuff, if I may. I am going to use my opportunity to speak to highlight three key points. We have submitted a detailed submission to the inquiry. I am not going to speak to that. I would like to bring three important issues to the attention of the inquiry today. This is to challenge what we consider is an extreme disinformation campaign that is rolling across Australia and is at an all-time high in Victoria specifically.

The first point I would like to make is that the Kwinana Energy Recovery facility in Western Australia is held up as proof that this industry can operate safely in Victoria and all over Australia. I come from Western Australia, and we have been following that project for many, many years, going back to at least 2009. I would like to table today two parliamentary questions from Western Australia, despite all the claims made by the proponents and the government of Western Australia at the time that continuous emissions monitoring data would be provided to the public, that the commissioning report would be released publicly and that all information that the community had concerns about this incinerator would be made public. Today I can confirm that the commissioning report will not be released publicly and that the flue gas treatment residue and bottom ash trials will not be required to be reported to the WA government and none of that information will be released publicly. It turns out that this incinerator in Western Australia, which has been operating since September 2024, released its commissioning report to the WA government in November 2025. There is nothing on the company's website, there is nothing on the government webpages, but you will find our Premier and our environment minister promoting this industry as being safe and proof that it is operating safely for the rest of the country all over social media.

You will hear MPs from all over Australia promoting this plant in Western Australia as proof that it is operating safely. What I can tell you is that I am already receiving whistleblower videos showing that the boilers are failing, that it is full of inappropriate material – it looks very much like mattress waste, which is high in PVC – and the videos show workers in the background coughing. In Western Australia there is no data, and yet the narrative across Australia and from the Western Australian government is that the community would have their rights upheld, would have access to all the data, that it is safe and operational. But the truth says something quite different, and I would like to table these parliamentary questions for you so that you can have that evidence yourself.

The second point that I would like to make is about the technology claims. One of the most widely used technologies comes from a company called Hitachi Zosen Inova. They have recently changed their name to Kanadevia. This is a German and Japanese multilateral corporation. Hitachi Zosen Inova incineration technology will be used in most incinerators across Australia and is the technology of choice in Western Australia. My colleagues in the EU and the US and Japan have provided me with reports from the Japanese government that detail inappropriate conduct from this company over a 20-year time period.

They have been found guilty of falsifying emissions and falsifying the technical performance of their technology. We consider this an absolute scandal. Here we have the most commonly used technology for this industry, and the industry has lied about its performance and its emissions for 20 years. This is quite significant because, again, there is a narrative by academics, by the media and by MPs across Australia, driven by industry, saying that this technology and this industry are completely safe, so much so Hitachi Zosen are noted on their website as saying that this industry actually cleans our air. The flue gas treatment systems clean the air; they emit a bit of steam, a few inert dusts and that is it pretty much. Clearly this evidence from the Japanese government speaks in direct opposition to those claims, so the Victorian government needs to investigate this immediately, as does the Australian government.

I want to be really clear in my third point, which is about the disinformation about old versus new technology, landfill being worse. These are industry narratives, old versus new technology, and this is particularly important when we talk about health impacts. We have heard a lot of academics rely on this claim as well, and this is quite a misleading claim, because the technology, as I have just demonstrated in my previous point, is not new. Moving grate systems have been around for decades. There is no change in the technology of this industry. What has changed is the requirement for them to expand their air pollution control residue systems, and that is because in around the year 2000, when they discovered that incineration across the world was emitting some really deadly pollution, they demanded that the industry upgrade their air pollution control systems to better capture this pollution. That was in the year 2000. So the new technologies that we are talking about have been operational for 26 years already. You can hardly claim that this is new technology versus old technology. The technology has not changed; the air pollution requirement systems are the part that has changed, and they keep adding to these air pollution control systems as they find more and more dangerous pollutants.

I want to make the point that there is no way to regulate this industry into safety. That is the bottom line. You cannot make waste-to-energy incineration safe, and you cannot for two reasons. The first reason is called the de novo synthesis. This is a technical term to describe the fact that the most dangerous pollutants are formed outside the stack, outside the air pollution control systems. As they exit the stack and cool down, these dangerous, persistent organic pollutants are reformed and attached to the very emissions that incinerators make, which are soot and ash. The dioxin attaches to the graphite, the carbon particles that burning material creates, so it is an industry that is inherently polluting, and the de novo synthesis shows that you cannot make it safe. The other part of this technology that shows that you cannot make it safe is what is called other than normal operating conditions. Incinerators have to start up. They have to shut down. They have to have maintenance. During those periods the pollutants are released unfiltered to the atmosphere, so one OTNOC event other than normal operating conditions can emit a year's worth of pollution, and we know that across Europe most incinerators have at least 12 OTNOC events a year. This leads to the evidence that is growing in Europe, where scientists have looked at the best practice incinerators that are operating and have found widespread contamination in the environment. They discovered this because the fantastic EU best practice regulation could not explain why the surrounding environment was full of dioxin – why it was in the meat, the eggs, the dairy. What they found is the de novo synthesis and the OTNOC events were falling outside of the regulatory framework, being missed and being deposited in the environment.

Let us not forget 12 million people in Paris around a best practice EU incinerator can no longer eat their backyard produce, and this is a result. More recently, in addition to 12 million people in Paris not being able to use their backyards, not being allowed to let their children play in the soil and not being allowed to eat their eggs or their produce, they have found PFAS in the neighbouring schools' air conditioning systems. So it is very clear from the reports in Europe – and we have referred to this in our submission – the true toxic toll of this industry means that you cannot regulate this industry into safety.

I just want to close with one other very quick comment about Victoria and the Victorian circular economy Act. Our organisation has been engaging with the Victorian government for many, many years and started well before the Victorian government set their cap and while they were devising their circular economy Act. We made submissions. We engaged online with them in all processes. Our contribution and input have been largely ignored. We are really concerned about this because we are very critical of the Victorian government's circular economy Act. It conflates terminologies and confuses them. When I read it, I have to say that I am so disturbed by how this Act has been written and that it conflates resource recovery with disposal. It conflates energy recovery with recycling. This Act goes so far as to enshrine waste-to-energy incineration – one technology under the banner of waste-to-energy, because let us not forget there are other technologies under the waste-to-energy banner that are not incineration – as if it is a legitimate part of a circular economy, which it most

definitely is not, and goes so far as to legislate a group of councils under a regional council banner to form a business with the sole purpose of signing contracts with waste-to-energy incinerator companies.

I think serious questions need to be asked about Recycling Victoria's agenda – why they would do that, and why they would create a framework in Victoria that is clearly anti-competitive – because at the end of the day my closing remark is: there are safer, more effective alternative technologies to manage what is effectively the smallest fraction of our waste stream, which is residual waste. Why would Recycling Victoria misappropriate those terms and legislate and enshrine a technology that is well recognised globally as being leakage from a circular economy? Thank you.

The CHAIR: If we could just have order in the gallery. It is not usual process to allow clapping and cheering. I am allowing it a little bit today because I know you are all very passionate about this issue, but it is also taking up time. If we can keep order and move to questions, we might kick off –

Jane BREMMER: Could we allow our independent expert adviser just 2 seconds for a comment?

The CHAIR: Yes, of course.

Lee BELL: Thank you, Madam Chair and committee members. I will keep it very brief. My role is to provide some resource capacity on the issue of persistent organic pollutants, which are the main concern that arises from incineration, both from emissions and in the toxic ash. I am a member of various expert committees of the Stockholm and Basel conventions, and I negotiate on these issues in Geneva. I am quite happy to answer any questions through TFA for that. Thank you.

The CHAIR: Thank you so much for that. Apologies, I thought it was a joint opening. We will move to questions, members. We have exactly half an hour left, so we will kick off with Ms Broad. I will have my phone timer.

Gaelle BROAD: Thank you. I am just interested in understanding a bit more. There has been reference to the circular economy. I just want to know: where does it fall short? What are those waste items that cannot be handled in the system?

Jane BREMMER: I am just jumping in and answering, if that is okay. Waste-to-energy incineration is one technology under the waste-to-energy banner. Residual waste is supposed to be everything we cannot compost, reuse or recycle. But how you collect waste defines what is in our residual waste stream. For example, in public places they are mostly red-lidded bins, residual waste bins, and in those bins go recyclable materials and compostable materials. The first thing to say is residual waste should be what goes to disposal, but that is not factually correct, because how we collect waste defines whether it is residual. One of the world-leading experts on the circular economy is the Ellen MacArthur Foundation, and if you look at the reports of the Ellen MacArthur Foundation it is really clear they identify waste-to-energy incineration as being leakage from the circular economy. That is why it is so confronting to see the Victorian government enshrine incineration in their circular economy Act when the rest of the world regards it as being outside of a circular economy. When you burn waste, it is a linear process. It is sold to us as if a lot of energy is created. But when you account for the embedded energy in the waste, the fact that they rely on the calorific value of plastic – which is a fossil fuel – and the fact that you need energy to start these machines and keep them going, waste-to-energy incinerators make very little energy at all. I am really glad to see that our colleagues from Zero Waste Europe are going to speak to you tomorrow. They are the experts on climate accounting and these claims. But it is widely acknowledged that waste-to-energy incineration sits well outside the circular economy. It is a linear process.

Gaelle BROAD: That is right. I am interested in how to handle those products. We have got landfill. Currently we export and make it someone else's problem. I do not think there should be a waste-to-energy treatment plant so close to residents here in Sunbury. It seems ridiculous. But I have seen technology that has been used overseas that uses AI to sort waste to make sure it is being categorised. Are you aware of that technology?

Jane BREMMER: Absolutely. That is the direction that the Nordic countries are taking in Europe. Advanced waste sorting is the policy direction they are taking to get out of incineration.

Gaelle BROAD: Can you speak to the solution?

Jane BREMMER: Really the solution is a systems process. The best way to manage residual waste is to not generate it in the first place and to put the policy and financial incentives at the front end of the waste stream, making sure we separate our waste. But there will always be some residual waste.

Gaelle BROAD: What are the options for that?

Jane BREMMER: Residual waste? Research stations, advanced waste sorting. Really in this day and age no waste should be going to landfill that has not been pretreated. We have a national and state FOGO policy, and that is designed to remove all that organic waste from the waste stream. There are a whole range of non-combustion technologies that can deal with bona fide residual waste. But we have to set up our systems in the first place to reduce residual waste generation. Once you get to that nasty end bit there are so many more alternatives. Anaerobic digestion can manage residual waste. It creates a dirty compost, but you are not creating the toxic air emissions and the toxic ash. That can then be landfilled without releasing methane emissions. It is a benign material. You can put it through a gas-phase chemical reduction, supercritical water oxidisation and other non-combustion technologies, which we promote, because Australia has another, more urgent issue called hazardous waste, and we really need to address the full spectrum of our waste management system not just the residual waste. As I said, we need to stop generating residual waste, and that means providing every household with the opportunity to separate their organic waste, separate their recyclable waste and reduce their residual waste in public places, in businesses, in restaurants – everywhere. That will reduce that residual waste volume to be far more manageable. But when you build big incinerators, you are tilting the system to feed the beast and generate and entrench residual waste. Just one final point: there are zero-waste city models all over Europe, so this is not reinventing the wheel. Australia is just so behind on the issue, and we have got a lot of industry influence in our regulatory agencies and across the board. But zero-waste cities are operating all through Europe and the Asia Pacific. It is all about sorting our waste – that is the key – and then finding the safest, best solution for the smallest fraction at the end.

The CHAIR: Thank you. We will go to Dr Mansfield. Feel free to flick your camera on, and we will see how we go. Ms Deeming is going to keep hers off.

Sarah MANSFIELD: Thank you. And thank you all for appearing today and for the evidence you provided. Jane, I am interested in understanding what alternatives exist to waste incineration for dealing with waste. The argument is so often put up that we have got a waste problem, we are running out of landfill space, and this is put up as the least worst alternative. What alternatives exist?

Jane BREMMER: Again, the best alternative is systemic. At worst there are safer, cleaner technologies – non-combustion technologies – to deal with residual waste if we do not want to change our system and develop more sustainable waste management or really invest in the circular economy, because critical to the circular economy is waste sorting. That is where you secure the resources for the future. If you do not set the systems up at the beginning for that, you are going to entrench residual waste disposal. But if we do not want to change at all and we want to generate huge volumes of residual waste, then let us choose a technology that does not generate hazardous waste ash or toxic pollution that contaminates the environment. Again, as I said, anaerobic digestion can do that. Advanced waste sorting is what the Nordic countries are looking at now to reduce their residual waste volumes. They are using AI and all sorts of technologies to ensure that they remove the things, the precursors, that make the pollution in the waste stream, like PVC, like plastics, all those things that make the dangerous pollution – advanced waste-sorting systems. Then at the end you can use non-combustion technologies like gas phase chemical reduction, supercritical water oxidisation, with the extra benefit of being able to create energy, hydrogen, without the associated persistent organic pollutants and hazardous waste ash. So there certainly are alternatives, and these are being practised all over the world already.

Pauline GALVIN: I would just like to add: it is not as if these incinerators do not actually still send about 30 per cent of their intake to landfill anyway, as a result of ash. That is the bottom ash, and there is the fly-ash, the air pollution control things, which are toxic waste. At least in Victoria, I do not think there is a facility that is qualified to take that level of toxic pollution. So we are just making toxic waste and still having to deal with landfill.

Sarah MANSFIELD: Arabella?

Arabella DANIEL: Thank you. And I especially want to say thank you to Jane Bremmer, who has so much expertise in this area and is informing us of all this very important information. I just want to reinforce something that she said. We always go for the quicker solutions – not necessarily that this is easy, but it is easier than what we really, truly should be doing, and that is the prevention side of this: going to changing our product stewardship so we do not generate [Zoom dropout] portion of waste going to landfill has not changed in the four years since the circular economy policy started. That means we are really not doing enough at all to prevent the waste. This pathway allows us to keep business as usual, living the lifestyle that we live and creating the waste. Going back and teaching our communities how to minimise waste creation, going back to our manufacturers and imposing new standards for packaging and life cycles of products – that is a bigger job. But it is so important that is the direction we go towards for our future – the environment, the climate, public health. Thank you.

Sarah MANSFIELD: Thank you. Jane, I might go back to you. A claim that I see so often around these projects is that they are a form of renewable energy. Are you able to, I guess –

Jane BREMMER: Dispel that myth?

Sarah MANSFIELD: unpick that a little bit?

Jane BREMMER: It would be my pleasure.

The CHAIR: Could I just jump in, briefly? Sorry, Dr Mansfield, your timer has gone off. It is fine to do this question, but I just thought I would let you know.

Sarah MANSFIELD: Okay, sorry. I could not hear that.

The CHAIR: Of course.

Jane BREMMER: Unfortunately, the Australian renewable energy Act includes organic and biomass waste. This is an industry that is relying on the tiny fraction of organics in the residual waste stream to claim renewable energy credits. In Western Australia they have given them more than 40,000 already without any evidence, based solely on the content of the organics in the residual waste stream. But we challenge that vehemently because, as you will hear from our colleagues from Zero Waste Europe tomorrow, waste-to-energy incinerators rely on the calorific value of plastic to be viable – that is a fossil fuel. When you look at this industry, per unit of energy produced, waste-to-energy incineration emits twice the climate pollution of gas and is equally and often more polluting than coal and oil, so to give this industry renewable energy certificates is absurd. It does not happen in Europe – or they are legislating against that. Waste-to-energy incineration is certainly not a renewable energy. It is a fossil fuel industry in disguise, and every analysis of its output and its climate output has shown that it is more polluting than fossil fuels.

Pauline GALVIN: I would like to add that, because it has to be on 24 hours, it is kind of promoted as a baseload power. But, in effect, what is going to happen is during the peak time, when actual solar is being produced, that is when it is likely to be the energy that is being curtailed in order to keep the baseload power going. So in effect, this really dirty energy is going to be displacing actual renewable power.

Sarah MANSFIELD: Thanks.

The CHAIR: We will go to Mr Ettershank. Thank you.

David ETTERSHANK: Thank you, Chair. And thank you. It has been compelling, your evidence today. Probably to Lee and Jane, a two-part question. I think the community generally has been inundated with all of this PR from the proponents of the scheme, and it is all about how we are going to have world's best practice. My question strikes two parts. One, when they refer to things like the European standard, the BAT reference documents and suchlike, are they actually as all-encompassing and fail-safe as they are being spun? And the second thing that comes with that is that, again, the proponents are saying this is captured in the Victorian legislation, and I am having a hard time finding that. I wonder if you can comment on both of those, please.

Lee BELL: Just on the first point, in relation to what they call BAT/BEP or best available techniques, best environmental practice – often called just best practice – in the situation with incinerators in the European Union, they have applied very strong emission controls limits upon them in terms of regulatory numbers and

also air pollution control equipment. But the reality is that these incinerators, even the most modern ones, are still well known as a major source of emissions of what they call unintentional persistent organic pollutants, or UPOPs. They still escape in the emissions, and that is why we are seeing more and more cases where the contamination is reaching the land around the facilities, entering the food chain, entering livestock and particularly dairy products, because the persistent organic pollutants are generally what they call lipophilic, or attracted to fats. This has become a significant problem. I was recently in Lausanne in Switzerland, where the whole centre of the city has been prevented from growing backyard food vegetables, similar to the case in Paris, because of an incinerator there that polluted the entire city centre. So this is not uncommon, and they are finding more and more cases of this occurring. The BAT/BEP regulations themselves do provide some measure of regulatory control, but it is only as good as the enforcement that is carried out, and that is becoming a significant problem as well. Most of the work of actually monitoring the emissions is either done by the incinerator companies themselves or it is being outsourced to consultants who have various allegiances. It used to be conducted by governments with in-house expertise; that is no longer the case, and that is the situation in Australia as well.

A third part of the problem with these so-called best available techniques is that there are many things that are not monitored that are coming out of the stack. We talk about dioxins, but there are several types of dioxins. The most commonly known ones are the chlorinated dioxins, but there are also brominated dioxins. These are not measured. These are not regulated. And we know they are coming out of the stacks. There are many studies showing large amounts of brominated dioxins are moving to the ash – the bottom ash, the fly ash – and out of the stack itself. PFAS is not monitored as an emission from incinerators, but recent studies, particularly on the Swedish incinerators, so-called state of the art, have shown PFAS in the emissions and in the ash and in the scrubber residues as well. And there are also dioxin-like PCBs, which are not being monitored but have been demonstrated to be there. So your regulation of these facilities via BAT/BET is only as good as the coverage of the pollutants that are being emitted, and only as good as the enforcement that is then carried out, which is based on the measurements that need to be independent. There are weaknesses in the chain of enforcement and regulation of incinerators that have not been resolved in Europe, and we have no experience of this type of regulation and enforcement in Australia, so we will be flying blind. We have heard what has happened in Kwinana in Western Australia. They will not release the data. Is there something that they do not want the public to know? We are interested in seeing that information, as so far the stumbling blocks of regulation and enforcement in Perth and in Western Australia have not been overcome. Unfortunately claims of BAT/BEP are not necessarily measured up against the reality, and that is the situation we have seen.

David ETTERSHANK: Can I just follow up on that second part, which is the degree that that is actually captured in or has been codified in Victorian regulation. Are you familiar with that question?

Jane BREMMER: I am not aware. I have not seen any policy or regulation around the framework that will apply to incinerators. What I can tell you, though, is in New South Wales there were a lot of claims that they are going to be safe in New South Wales because the chief scientific officer and the University of Technology Sydney had looked at and had set strict regulatory standards that met those international best practice standards – which do not actually exist – and we took a deep dive into that and showed that it was incorrect. So there are a whole range of pollutants that are not being measured. The standards that the New South Wales government is applying as part of best practice standards were not comparable to the EU standards – were far less protected – so there is really serious cause for concern. I do not know if the committee or the audience understands what persistent organic pollutants are. They are otherwise known as forever chemicals. They are transboundary; they are global. Ultimately they end up in the marine food chain and accumulate in the polar ice caps, and this is an industry that is very climate polluting. Those polar ice caps are melting and re-releasing this contamination into the environment. So this makes this industry a threat not only to local communities but globally. They are the subject of at least three UN conventions as a result: the Stockholm Convention; the Minamata Convention on Mercury, because let us not forget incinerators are in the top five sources of mercury pollution; and then there is the Basel Convention, because the ash they produce is considered hazardous waste, despite the disinformation about using this ash in the circular economy to make roads, bricks, houses and all sorts of wonderful things.

David ETTERSHANK: Thank you.

The CHAIR: Thanks, Mr Ettershank. We will go to Mr McIntosh.

Tom McINTOSH: Thanks, Chair. Thank you all for being here. We have heard a bit about the mechanical recovery and the advanced waste sorting. Lee, I would like to hear from you about the work you have done in plastic waste, because obviously that has got emissions in its manufacture, but also the risks and best practice to deal with that. And then if you wanted to come back to – Jane, I know you spoke a little bit before on the non-combustion technologies, but if there is anything further you wanted to add to that, Lee.

Lee BELL: Yes, thanks. In regard to plastic waste, it is a major problem, not just here, obviously around the world. Burning it in incinerators is not a solution because of the chemical additives in plastics, of which there are thousands, many of them hazardous. Over 4000 have been identified as hazardous so far. When you burn them in an incinerator, they are released. The chemical additives form new combinations and new pollutants. So how do we deal with plastic waste? What Australia has traditionally done is exported it to South-East Asia, but after the China National Sword policy we were no longer able to do that. We did try a few other countries. Now, currently there is the situation where they are trying to export plastic waste as a fuel in the form of refuse-derived fuel or processed engineered fuel. The federal government wisely stepped in and declared it Y48 waste under the Basel Convention, which means they require a hazardous waste permit to export it, so not much of that is being exported anymore – a small amount to Japan, I believe. So how do we deal with plastic waste in Australia? The least impact on the environment is by mechanical recycling of plastic waste and by reprocessing those plastics that can be processed by mechanical recycling. But again, the chemical additives in plastic play a role in making that more and more difficult. Therefore there are several polymer types that cannot be effectively or economically recycled that way, and they tend to become residual waste as it stands.

Tom McINTOSH: What percentage would that be of broader plastics?

Lee BELL: Overall? It varies, but it would probably be something like 50 per cent of all plastic waste that is not subject to recycling because of what they call immiscibility – they cannot mix it with other polymers – and because of the chemical additives causing problems in the recycling processes. You will hear now that there is a process called chemical recycling, which is supposed to overcome all of this, but chemical recycling, usually via pyrolysis or gasification, has its own problems and tends to have highly contaminated outputs which do not have much economic value. So that particular issue is a bit of a white elephant in terms of economics.

The problem with plastics is the plastic industry will not make polymers that can be easily recycled. They want to have a whole range of chemical additives in them that give them all sorts of functionality. Until they make plastics that are designed for recycling, our recycling rates of plastic will not rise dramatically. For now I can say that mechanical recycling, based on its life cycle assessments, is probably the best way to deal with plastic waste in Australia, certainly not burning it.

Tom McINTOSH: What sort of cost to industry would there be to, as you say, address the percentage of the volume of non-recyclable plastics to make it more compatible with recycling?

Lee BELL: That would be a question for industry and how they would manage that. It is something that industry must take responsibility for because it is upstream in the plastics manufacturing process. Currently, the plastics industry is offloading its responsibility for additives onto the recycling operators. They are basically outsourcing their liabilities in that regard. Until Australia has significant regulatory enforcement over plastics manufacture and import and reducing its hazard and toxicity, we will not see many improvements.

Tom McINTOSH: Okay. Of consumed plastics in society, do you have a sense or have you done work or looked at research as to the easiest plastics to remove out of production or circulation and use in our society? Just to give us a feel for what could be done quickly, at least, what is the lowest hanging fruit? Obviously, we have seen moves in recent years with straws and bags and different things, but what are the next opportunities?

Lee BELL: That is the difference between products and materials. PVC, polyvinyl chloride, would reduce the hazard of our plastics waste stream dramatically, and alternatives could be found to deal with that.

Tom McINTOSH: Where is it predominantly used?

Jane BREMMER: Soft plastics.

Lee BELL: Soft plastics, but also in construction.

Tom McINTOSH: I am an electrician by trade, so I just see it is also in soft. Yes. Okay.

Jane BREMMER: Would I be able to make just a quick point? There is this myth that plastic is recyclable, and it is essentially not. Even the most recyclable plastics like PET and HDPE can only be recycled so many times. So this concept that we can recycle plastic is also part of the disinformation campaign when we consider that plastics are fossil fuel. By design, plastic is not circular. Five to seven times is the maximum for a PET bottle. So what happens with the plastic recycling stream is it is becoming a drip-feed of recycled plastics into a business-as-usual model, and the industry is on a trajectory of a fivefold increase in plastic production by 2050.

The point I want to make is this is really important for Victoria, because there was a COAG meeting many years ago and all the states were awarded a particular recycling job. Victoria got chemical recycling, and that is a concern for you because chemical recycling for plastics is failing all over the world. These plants are going into financial receivership and shutting down because they are not technically or economically viable. That is because plastic is not really a circular material. To get it into a fuel or to the chemicals as precursors to make new plastics uses huge amounts of energy, is entirely expensive and generates lots of dangerous pollutants, and this is why that industry is collapsing all over the world. That is a red flag for Victoria there, that you have been allocated chemical recycling.

Tom McINTOSH: Okay. Thanks, Chair.

The CHAIR: Thank you. That is right on time. Mrs Deeming I believe would like to submit her questions on notice. Sorry, Arabella, were you about to contribute to that?

Arabella DANIEL: I just want to emphasise how much I support the expert witnesses' statements on everything they have said here. I thank them again for their time, and I hope their testimony is really taken on board. Thank you.

The CHAIR: Wonderful. Thank you so much. We have run out of time again, so I will cut myself off and potentially put some questions in on notice, as other committee members might do as well. That concludes the public hearing. I just want to thank you for coming along and sharing such valuable evidence with us, as well as your submissions.

Witnesses withdrew.