

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

Melbourne – Tuesday 26 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 (*via videoconference*)

Dr Peter Tait, Public Health Association of Australia;

Dr Atiq Zaman; and

Janek Vähk.

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 or in the public gallery.

To kick off, we will just have committee members introduce themselves to you, starting with Mr McIntosh.

Tom McINTOSH: Tom McIntosh, Member for Eastern Victoria.

The CHAIR: Georgie Purcell, Member for Northern Victoria.

David ETTERS HANK: David Ettershank, Western Metropolitan Region.

Rachel PAYNE: Hello. Rachel Payne, Member for South-Eastern Metropolitan Region.

Sarah MANSFIELD: Sarah Mansfield, Member for Western Victoria Region.

The CHAIR: Thank you so much for taking the time to appear 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, could you please state your full names and the organisation you are appearing on behalf of.

Atiq ZAMAN: Shall I go ahead?

The CHAIR: Yes, please.

Atiq ZAMAN: Okay. Hi, this is Atiq Zaman. I am an Associate Professor at Curtin University Sustainability Policy Institute. I am also a member of the UN Council of Engineers for the Energy Transition, but I am today representing as a circular economy expert, as an individual, rather than representing Curtin University or the UN.

The CHAIR: Great. Thank you. Peter?

Peter TAIT: I am Peter Tait. I am representing the Public Health Association of Australia. I am a GP by trade in my day job, and public health is a deep interest of mine.

The CHAIR: Great. Thank you.

Janek VÄHK: Shall I go?

The CHAIR: Yes, please.

Janek VÄHK: Yes. Okay. Good morning. My name is Janek Vähk, and I am a Zero Pollution Policy Manager at Zero Waste Europe. I have been following the particular issue of waste incineration for more than a decade, and today I offer my own expertise. I do not necessarily represent Zero Waste Europe.

The CHAIR: Great. Thank you. We will go to your opening comments. We tend to try and keep them to around 10 to 15 minutes – but just noting that we have three separate individuals, it is totally fine if it goes slightly over – and then we will move to discussion and questions from members of the committee. Did anyone want to go first?

Atiq ZAMAN: Happy to go first. Good evening, everyone. I would like to thank the Chair and the panel members from Victoria's Legislative Council for this opportunity to address you today. As I have already mentioned, I am Atiq Zaman. I am an Associate Professor at the Curtin University Sustainability Policy Institute. I am also an advocate for the zero waste, circular economy and sustainability practitioners, with a decade of professional experience. Also my role with the UN is as a member of the UN Council of Engineers for the Energy Transition, which is a high-level advisory body to the UN Secretary-General that fosters global net zero emissions transitions. Today I will provide evidence based on my professional opinion on whether the proposed waste-to-energy development and expansion proposal represents the right infrastructure choice for Victoria at this point, particularly in the transition to a circular economy. I will draw evidence based on international case studies as well as the proposal document. I will speak maybe 5 to 6 minutes if you do not mind, just to give my opinion of the overall project proposal.

I want to be really precise about the question before this panel. The relevant question is not whether this proposed facility can operate within its stated emissions limit. I accept that the proposed design adheres to European best practice standards and also that the technical assessment is detailed. But a more important question is: should Victoria lock itself into a large-scale 30-year combustion system that is designed for expansion and is also committed to a large volume of waste when better options are already available and becoming available right now?

If you look into the international and national experiences, I think that will provide a clear answer. Let us look into them. For example, while Denmark is one of the world-leading waste-to-energy countries, Denmark is actually reducing incineration capacity by approximately 30 per cent by 2030. It is not that the incineration plan failed in Denmark; rather it actually became a structural barrier for recycling. This is one of the biggest challenges when you talk about waste-to-energy incineration plants like the proposed one. Let us come back to Australia. As you know, in Western Australia, from where I am speaking to this session, we have two waste-to-energy facilities, and one is currently operating. However, these waste-to-energy facilities are already causing significant challenges for local government to select better waste management options like food organics and garden organics – as we know, FOGO in Australia. Because the council has a commitment in delivering a certain volume of waste to these waste-to-energy facilities, this is significantly undermining WA's recycling effort. I believe these two are lessons for Victoria.

A circular economy is not simply about diverting waste from landfill. This is the main proposition the proposal portrays. It is about keeping material in use as long as possible through redesign, through reuse, repair, remanufacturing, recycling and organics recovery. Combustion is the second-last option in the waste hierarchy. It should not be considered as a source of energy generation when more efficient and environmentally friendly options are already available in Australia.

There are a couple of concerns I will maybe just quickly go through. The first main concern is feedstock governance. As per the proposal, 60 to 80 per cent of feedstock would be initially sourced from commercial and industrial waste. In Victoria construction and industrial waste do not require any legislative requirement for source separation, meaning that waste would be available in terms of the recyclable component of it, meaning that is not residual waste at all. On top of that, if you look into the draft waste acceptance protocol list, it has listed glass, all types of plastic, metals, paper and cardboard as acceptable feedstock. These are recyclable commodities with established markets in Australia. This is a real and documented risk. These types of recyclable materials will not actually go into recycling facilities; rather they will be used to generate electricity.

A second concern would be greenhouse gas, for example. I think in the application it already acknowledges that the climate benefit, as per greenhouse gas emission reductions from this proposal, will diminish over time – as the electricity grid decarbonises over time, landfill gas captures improve over time and waste composition changes eventually – meaning that the overall greenhouse gas emissions benefit that is proposed in the project is not really valid, because it does not really reflect a long-term benefit at all.

The third is energy alternatives like renewable energy, alternative or not, when you already have established, particularly with the CSIRO, in various reports that wind and solar energy used with storage systems are more cost effective – at least one-fifth of like costs compared to waste-to-energy electricity generation. The proposed waste-to-energy generation has only 28 per cent net thermal efficiency, which is not a really significant clean energy solution when you are actually comparing it with solar and wind energy and relevant renewable energy sources. Then I think the biggest concern is the 30-year infrastructure risk, because the council needs to be locked into that phase. Given that the cap has actually increased to 2.5 million, or even 3 million by 2051 in projected volume, that would be actually a significant pressure on the current recycling market in Victoria. Given that the Victorian government has circular economy aims and also that we have a national circular economy framework in place, this expansion and this sort of technology or facility would definitely undermine that circular economy initiative overall in Victoria.

To the Chair and to the panel members, based on the international evidence, the WA experience and also the evidence provided in the document itself, my expert opinion into this proposal at this scale is that with the feedstock governance framework at this moment in Victoria's transition to a circular economy and also the presence of a national circular economy framework that all state governments would be actually supporting and following to achieve national circular economy goals, this proposal poses a long-term infrastructure lock-in that will undermine Victoria's circular economy and recycling initiatives. Meeting technical standards is not the same as making the right long-term decisions. Victoria has a long, strong track record in sustainability. I believe this panel has the opportunity to protect that reputation by choosing a more ambitious pathway, one that already exists, that is affordable and also is proven and that includes better recycling, organic recovery and renewable energy. This proposal would lock Victoria into a combustible pathway for generations. Thanks a lot for listening, and I am happy to answer any questions you might have.

The CHAIR: Wonderful. Thank you so much for that. We will move to the next opening remarks.

Janek VÄHK: First of all, thank you for the invitation. I think Atiq already said many of the things that I want to say, but I really want to bring in the perspective from Europe. As I said, I am following it very closely here in Brussels, Belgium. I have more than a decade now working on it. I have really four main points I want to raise. I think one of the main ones is that what we hear in Australia, but not only in Australia because I also look at what is happening in other regions, is the argument that incinerators are considered to be safe because they comply with the European Union standards and so-called best available techniques. I want to make a point that this is largely a very misleading argument, because having strict standards does not mean that there are no risks or impacts. For the last seven years we have been studying the impacts of incinerators in different countries, including in France, in Belgium, where I am based, but also in the Netherlands. These are some of the countries which have the highest incineration capacities in Europe.

What I want to make a point about is that these rules, they do not eliminate the risks. They reduce certain emissions. Very much the focus in past years has been, for example, on mercury and heavy metals, but they do not eliminate pollution and they do not remove the fundamental problem, which is linked to the burning waste. Even under the current EU regulation, which was just reviewed a few years back, incinerators, most importantly, they emit a lot of greenhouse gases. That is why the European Commission is now working on including them under the European emissions trading scheme in order to penalise the CO₂ emissions. We have a lot of facilities, so we cannot just stop them the day after tomorrow. So that is one of the ways of making incinerators pay for their emissions. But apart from that, they also emit a lot of particulate matter, nitrogen oxides and heavy metals, and most of the focus recently is on persistent organic pollutants, and something which I also hear is that they are replacing landfills. I want to say that European municipal incinerators, they produce 12 million tonnes of bottom ash a year, and this is a toxic residue. What it does is it converts the municipal waste, which is non-hazardous, into toxic residues that require long-term containment in landfills. So waste does not disappear in this context; it is rather transformed into emissions and hazardous waste residues.

I mentioned that we have been studying together with an independent research organisation called ToxicoWatch in different locations in several European countries, and we have found high levels of dioxins and PFAS and heavy metals in soils, in vegetation, water and even food items that were collected near incinerators operating under the so-called EU standards. And in some cases we have found exceedances of 100 times what is normally permitted, for example, for consumption or for sale in supermarkets. So this food which is grown near incinerators cannot be consumed or sold, so it is really an issue. We have conducted baseline surveys in some of the countries and we are seeing that every year the emissions go up higher and higher so the food gets contaminated. My point is that meeting those EU-level standards does not necessarily prevent cumulative pollution and bioaccumulation by these persistent organic pollutants and the long-term contamination. So we have to be really cautious about – we do not talk about emissions in one day or even in one year; we talk about emissions over the 20, 30, maybe even 40 years. We know some sites that have been there for many, many years and they are heavily contaminated, so we have to be really cautious about it. We do not just talk about one-day pollution.

I think from the policy perspective it is really important to consider that, and there is more and more in Europe consideration of non-combustion alternatives. At Zero Waste Europe we recommend looking at what happens with the waste that is generated and what it is composed of and really focus on material recovery – basically sorting the waste, because a lot of it is recyclable and can be pulled out – and then safe containment of the leftover in landfills. We always recommend that if there is any organic ending up in there that should be biologically stabilised, so once it is landfilled it will not create methane and leaching.

Thank you, and I look forward to any questions you might have.

The CHAIR: Thank you so much for that. Peter?

Peter TAIT: Thank you very much for inviting me to come and talk. I strongly support what Dr Zaman and Janek have said in this. From a public health perspective I am wanting to change the frame a little bit. There has been a reasonable amount of work done over the years that has demonstrated that there are a range of adverse health impacts from waste-to-energy incineration, which include neoplasia, congenital abnormalities, infant deaths and miscarriages. The claim that these were from older incinerators – the claim that we cannot necessarily attribute these health effects to the incinerators – in a way is misleading and inaccurate. I think the issue is that these harms have been demonstrated and therefore it is likely that the incinerators may be contributing some of that harm. That modern incinerators under the new technologies and using the new operating standards are cleaner from a health perspective it is much too early to say definitively, because there just has not been time for any trend in adverse health consequences to emerge. I think there is evidence that there is a correlation of harm. It exists and it cannot be dismissed.

But I would like to actually think a little bit outside the strict medical health box and think more broadly in terms of human health and wellbeing and planetary health. I think that the emergence of incinerators as a garbage disposal mechanism needs to be really thought through, and Dr Zaman really clearly laid down those issues that need to be brought in mind. But just to come at it from a slightly different perspective, I think there are social, economic and environmental aspects of this question that also need to be considered. From a social perspective, communities' experience of waste-to-energy facilities being imposed on their communities with unconvincing levels of consultation is part of a trend that we are seeing in society at the moment, where the community is losing trust and confidence in government and government's ability to look after them, and I think that is a serious impact on our democratic system that we need to pay some attention to.

I think in terms of economic and environment issues, these are sort of mixed. We do need to recognise we have a garbage problem, and we do have to work out what we can do about that. But just focusing on landfill or just focusing on waste-to-energy incineration is too narrow. We need to take a really broad, big picture look at the system from creation of product that becomes waste through to the disposal of what is left. We do have the national waste framework and strategy, and that really says that we need to move to a circular economy. The key to circular economy and waste reduction is reducing, and reducing means we are having less environmental impact by reducing material resource need and we are also reducing energy need directly in manufacture and in transport and in disposal. This whole line from reduction as the primary thing with redesign, reuse, repurposing all the way down to recycling is really important, and we need to be focusing very clearly on that.

The other thing is that having this broader approach to waste creation and disposal will of itself lead to reductions in greenhouse gas emissions. Although I have not seen any numbers that tell me how much compared to other forms of waste, I think it is important. The other point that has been made is that building and relying on these waste-to-energy incinerators is creating a perverse incentive where people have to create more garbage to be able to feed the life cycle of these facilities over 20 or 30 years, and that clearly is not in our best interests. I think claims of economic and environmental benefits need to be taken very cautiously. The studies that promote the benefit of waste-to-energy recycling are often limited in scope and of poor quality, so I would be recommending that the committee takes a cautious approach to any claims by industry and by proponents.

Finally, just very quickly, I and some students at ANU did an economic, environmental and sociopolitical aspects of waste incineration review last year, and the conclusions of that, from the literature that we reviewed, are that it appears that we are going to get ever-diminishing economic and environmental benefits from waste-to-energy incineration, particularly as electricity becomes more renewable and as recycling takes over as the predominant waste strategy. The recommendations that came from this study were that waste-to-energy incineration should not be relied on as a significant and enduring component of energy supply and waste management in the Australian context; that Australian governments need to pursue waste minimisation and diversion policies aggressively; that state and territory governments should be more proactively involving communities in waste management planning, which includes reduction in waste and therefore the need to reduce disposal; that more progressive waste management strategies, which have proven effects already in other settings, should be adopted to facilitate the move towards renewable energy and waste minimisation; that, in particular, governments should be much more proactive in engaging with communities where waste management facilities are to be sited and much more responsive to the concerns that those communities have; and that if waste-to-energy incinerating facilities are built in communities, then there needs to be long-term, real-time, continuous monitoring of the health, social and environmental impacts and there need to be structures for reporting that information back into the community in real time. Thank you for having me, and I am happy to answer questions if I can.

The CHAIR: Wonderful. Thank you so much for that. We will move to questions from committee members, and I will start with Dr Mansfield.

Sarah MANSFIELD: Thank you. Thank you all for appearing today and for your presentations. Dr Tait, I might start with you. We heard earlier from the EPA that based on a recent systematic review from the UK there is not any demonstrable link between modern waste incineration facilities and poor health. I am just wondering what your view on that assessment of that research is, taking into account the comments you made earlier about the lack of, I guess, time to show an effect.

Peter TAIT: It is not that recent; it is a few years old, that review that they reported. I think my reading of that review is that a lot of it relies on the fact that there is lack of evidence of harm at a high level, but equally with that lack of evidence of harm, there is also a lack of evidence of no harm. So they are sort of saying, 'Nothing to see here, because we haven't found it.' That is why I am thinking we need to be cautious about these sorts of claims. I think that there is correlation, and attribution is difficult, but the fact that there is some correlation means there is still potential to do harm. So the other questions here are: how much harm or risk of harm are we expecting communities who are being asked to host these facilities to wear on our behalf, and what compensation do they get for wearing that risk for us?

Sarah MANSFIELD: Thank you. From that, as someone who has spent a lot of time looking at some of these issues in public health around attribution, can you speak to what some of those challenges are and why things like the precautionary principle are important?

Peter TAIT: Communities get exposed to toxic substances and chemicals from a lot of different sources. Now, it depends where they are, what is upwind of where they are living. You know, there might be other industries, there might be a major highway which is contributing some pollution into the environment and there may be a waste-to-energy incinerator. All of those things have the potential to be putting toxins into the environment which we may be measuring and we may be picking up as ill effects. Being able to tell exactly which chemical comes from which source can be difficult. I mean, it could be done. There are some chemicals that are only made in incinerators; there are some chemicals that would only be made in, you know, highways or in other industries. Not a lot of work seems to have been done to answer that question. The precautionary

principle is important, because it means that if there is the possibility of harm, it behoves governments to take that precautionary approach of not trying to increase the risks of harm that their populations are exposed to.

Sarah MANSFIELD: Thank you. You have made arguments in some of your research about, at the very least, not locating – I mean, we will put aside the fact that I think you have made a broader argument about whether we need waste incineration at all, but if we are going to have them, they should not be located near food production. What is the basis of that argument that you have made?

Peter TAIT: If we are thinking about things like heavy metals, dioxins, furans and other chemicals that come out of incinerators – at least the older incinerators, and it is not as clear how effective the newer incinerator technology is in scrubbing those out of the emission stack – it is likely that exposure will be through eating food that has been contaminated rather than by inhalation or deposit on the skin. That, of course, is not entirely straightforward, because food that is grown here might be transported and consumed somewhere else. So again, attribution is difficult. Janek can probably talk better about the eggs in Paris example.

Sarah MANSFIELD: Perhaps I will ask you if you can do that, Janek.

Janek VÄHK: Yes. Well, I mean, indeed; I think the issue we have is that measuring things from the stacks is not really reliable – and that is why you need to have some kind of biomonitoring – because what it does also is it does not look at a specific chemical that comes out of the stack, it looks at the full toxic impact that a facility might have on public health and the environment. That is what biomonitoring does. In some of the places we have managed to – I mean, it is regulatory also; it is now required to have biomonitoring. So the question is like how often and so on, to ensure that there is not this negative impact. And indeed, we have been having projects – it is a little bit expensive, so, you know, it depends on the funding available, but over the last seven years we have been able to look into it in six countries, and we have the same pattern everywhere. Everywhere the emissions, compared to baseline, are going up, and just in a matter of a few years – or sometimes in a year – they are already above the levels that you are allowed to consume. So that is the issue. And in some cases – of course you cannot generalise and say that it is everywhere the same. But, for example, in Spain we found that the levels were, like, 300 times higher than you would normally be allowed to consume.

The CHAIR: We will just do one more question, if that is all right. Sorry, Dr Mansfield.

Sarah MANSFIELD: It is just a clarifying question around the biomonitoring, because we heard again from the EPA that there will be emissions monitoring, but you are saying we need to do additional biomonitoring over and above that.

Janek VÄHK: Yes.

Sarah MANSFIELD: Can you explain what that looks like – what good biomonitoring would look like?

Janek VÄHK: Exactly. What we recommend is taking samples from the surrounding 2-, 3-kilometre distance or radius from the incinerator as a minimum, and then of course the reference sites may be a little further away. Taking samples of vegetation, it can be mosses, pine needles; it can be anything – like a chicken egg, if there are backyard chickens, for example, in the case of Paris, but in many other places they also have them. These are really good examples. What it does is that you can actually look at the full toxicity that has accumulated in that egg and analyse it for dioxins, for furans, for PFAS, and that gives you a much better picture than measuring the stack emissions. And just to clarify why also, because we are monitoring certain chemicals, not all of them – for example, we are only monitoring chlorinated dioxin, not brominated and other types.

We are also not really monitoring PFAS at all. We know that PFAS is a concerning problem. Especially here in Europe, we talk a lot about PFAS now. There are many cases where monitoring does not happen at all. For example, we are only required to monitor emissions during the so-called normal operating conditions. But we know that they are discovered in abnormal or where facilities are shutting down, starting up or have had accidents. These are very, very regular moments happening during the operation of incinerators, and these are the moments where actually most of the emissions happen. There is also an issue that with certain chemicals, it is very difficult to measure just directly from the stack. So yes, if you want to have a full picture, you need to have biomonitoring.

Sarah MANSFIELD: Thank you.

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

David ETTERS HANK: Thank you, Chair. Thank you very much for joining us today. I have got a few questions. Dr Zaman, we had a witness earlier and we were talking about Denmark, and you mentioned Denmark, where I think they are proposing a 30 per cent reduction over the next half a dozen years or less than that. The proposition was put to us that that was not actually an argument against it because it was just old plants that were coming to the end of their life and a level of actual incineration would continue; it would just be in a fewer number of plants. Is that sort of consistent with your understanding?

Atiq ZAMAN: Yes, because of not actually putting in the system again, because if, let us say, Denmark is benefiting from waste-to-energy, surely they would be replacing the old one with the new one, because even the less than 30-years-old one, they have more efficiency achieved with the new technology. But moving away is providing the signal because their actual recycling rate is very low compared to what would be perceived. For example, often we see Sweden is diverting 100 per cent or 99 per cent of waste from landfill. This is a great number to see, but if you look into their actual recycling rate, it is around 50 per cent. Why are they not actually increasing or having a higher level of recycling? Looking in more detail into what is their recyclability, for example, material circularity, what then Sweden is actually doing, from the material point of view – going back to the system, which is our main prime focus, material circularity – in a circular economy context is less than 3 per cent for Sweden. So surely these sorts of practices in waste-to-energy facilities are depleting the very important material that we are really arguing that we need to actually substitute virgin material dependency through material recovery, and waste-to-energy facilities are actually destroying those material values. As I mentioned at least as a proposal, plastic, metal, cardboard – all of those recyclables would be considered as feedstock, meaning that we cannot recover those materials that are actually coming into the system. That is my understanding: yes, it is reducing, the old one. But let us say, if we have very good technology and we are benefiting from it, why are we not actually then incorporating it, because the old one is diminishing because of the challenges? It is a structural challenge. If you look at the Scandinavian countries, Sweden, Denmark and other countries, and into the recycling grid – the absolute recycling grid, not waste-to-energy – it is around the 50 per cent mark, because they cannot go beyond that, first of all. Also, the absolute material circularity is even negligible, unfortunately.

David ETTERS HANK: Okay. Thank you very much. Mr Vähk, could I ask you, please: we have had it put to us as a committee repeatedly today that the European standards will be adopted and that in that context ‘All’s good. These are the most rigorous standards in the world, and we don’t have a problem.’ I think that is a fair way to describe it. We actually had one advocate today say simply that ‘Waste-to-energy incineration is safe’ – just an unqualified statement. I am wondering, based on the experience in Europe, and you talked about persistent organic particles and such like, would the adoption of the BATs address all of those concerns? Is it just safe?

Janek VÄHK: I think maybe let me go back to what I said just before. Indeed the best available technologies allow you to reduce certain emissions. Unfortunately, there are a lot of things that are not being measured and monitored at all. These are maybe best available technologies for today, but they are incomplete. So if you want to have a full picture, you need to really have some sort of biomonitoring which shows the full toxic impact that the facility has. This is not happening, even though it is actually much cheaper compared to, for example, running twin dioxin emission measurements twice a year and bringing the equipment from somewhere. It would be much more efficient to have a much better picture of what is happening in the immediate surroundings of a facility. So my answer unfortunately is that they are not safe. We have been looking into facilities now in six countries, and the picture is the same everywhere. Everywhere we see the emissions are going up. It is not just that we find dioxins, but with the levels, as I said, if you were growing some food, it would not be recommended for consumption. I think there are quite serious concerns, and we are talking about really the state-of-the-art, most recent facilities that have been built maybe just a few years back in, for example, here in Belgium, Lithuania and Czech Republic.

David ETTERS HANK: Okay. Thank you. We might get the secretariat to reach out and ask you to provide some background information on that if that is okay.

Janek VÄHK: Sure.

David ETTERS HANK: Thank you so much. Thank you, Chair.

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

Tom McINTOSH: Thanks. Dr Zaman, with Denmark with the oversupply, do you know how many millions of tonnes that was that they had per annum as their demand or supply?

Atiq ZAMAN: No, unfortunately I do not have the exact number in front of me, but I am happy to provide that number if that is helpful.

Tom McINTOSH: Yes, it would just be interesting to compare. Do you know how that population compares to Victoria, from a tonnage perspective? I suppose I am just interested in the comparative nature. Sometimes percentages are good; sometimes they are perhaps not if you are looking at tonnage versus population and that sort of stuff.

Atiq ZAMAN: If I put Sweden as an example, around 50 per cent they are incinerating, and then 50 per cent is actually going to –

Tom McINTOSH: Of their waste?

Atiq ZAMAN: Yes, of their waste. Then 49 or 45 per cent is actually going to recycling. That is the recycling rate they are currently at. I think this is how we can maybe compare per capita if you are really interested in a per capita one. But unfortunately, I really do not have that number at the moment.

Tom McINTOSH: No, that is fine. That is actually really helpful. I feel like that is a really good way to use percentage. Thank you for that. I just wanted to ask Dr Tait about – you talked about measuring toxins or chemicals or pollutants in place. Just talk to me about that – say, measuring a field versus measuring a smokestack. I suppose you were talking about new technology versus old technology and needing the time to see the outcomes of that. What about the pollutants coming out of the old stacks versus the new ones at the source? Is that something that can be considered?

Peter TAIT: The measurement of actual smokestack emissions being monitored at the smokestack and monitoring in the vicinity of facilities and biomonitoring of plants and animals in the facilities I can comment on generally, but engineering technicalities are not my area of expertise. So the point that I am making from a health perspective, the first part is that if we want to know what is coming out of facilities that may be potentially harmful, we need to be looking for them, and we need to be looking for them all the time, not just during routine operations, but during starting up and closing down, which happens when a facility needs maintenance, for instance. The second issue in terms of the timing of when health effects might appear, some effects will appear sooner rather than later, for instance, birth defects are going to be relatively soon to be shown up in the record. It depends a bit on the number of defects above the background rate, and sometimes that can be difficult to pick. The second issue is other adverse health impacts such as cancers might take a long time to develop because there might need to be decades of exposure, and you then need to be able to pick up an increased trend.

Tom McINTOSH: I am nearly out of time, but I suppose my question is if we know that, let us say, for example, I think people have referenced and I think you mentioned before, diesel pollutants coming off a freeway have X amount of chemicals with X amount of adverse effects on humans, and that a waste-to-energy stack might have X amount of potential contaminants with X amount of particular effects on humans. With vehicle emissions, we have reduced the emissions from the vehicles we make over the decades, and now we are going electric. We will not go into that, because we had a whole inquiry on that. But the impacts on the population are less and less the lower the volume of the output. Is that not similar with the new technology of the waste-to-energy having lower output, like with our vehicles?

Peter TAIT: I mean, the short answer is yes, but short and simple answers are often not entirely accurate. I think the better the technology, the less the impact, but the point I was making before is that we just cannot look at the health impacts directly from the incineration. We have to look at this much bigger picture about how waste disposal and waste management fit into what we are doing in modern society. So there are environmental impacts, there are resource impacts and all that stuff –

Tom McINTOSH: Yes. I am out of time. I just wanted, as the public health association, to get the health side, because we have got lots of different people presenting lots of different evidence. I am out of time, so I will not go into the other stuff, but it was just the health side. So thank you for that.

Peter TAIT: My point is that these things need to be thought of as health considerations.

The CHAIR: We will go to Ms Payne.

Rachel PAYNE: Thank you, Chair. I was going to ask a question of Dr Tait, but I will come back to Dr Tait. Mr Vähk, can I ask: in relation to alternatives to waste-to-energy, you have highlighted that material recovery and biological treatment, or MRBT, combined with improved sorting, is a better alternative to waste-to-energy. Has this been implemented anywhere internationally at scale, and is this viable at the scale required in Victoria?

Janek VÄHK: Yes, absolutely. There are many examples of so-called material recovery and biological treatment sites. It takes the residual waste – I do not like to actually use the term ‘residual waste’; it is mixed waste because it is mostly what is not collected separately – and it sorts the waste. It pulls out all the materials that can be still used and then biologically stabilises the organic fraction, so when you landfill it, it is actually safe. This kind of system is actually much more flexible because it does not necessarily require you to bring a certain amount of waste, so you can have it more modular according to the needs of a municipality. In turn, they actually need to have a certain site in order to be economically feasible. Often it is recommended to be at least around 200 tonnes per year. The MRBT system is much more flexible; it is more adaptable. You can actually study the composition of waste and then add to it, for example, to recover more types of plastics or paper according to your needs. It is also much more cost-effective. There was actually a very recent study published by SystemiQ that recommended to have this MRBT system in combination with advanced landfilling.

Rachel PAYNE: Thank you.

Janek VÄHK: There are many examples. Actually, we are organising a study tour with one of our members in Portugal. You are welcome to join if you want.

Rachel PAYNE: I would love to join you. Did you say Portugal? I am there.

Janek VÄHK: Yes, Portugal.

Rachel PAYNE: When it comes to life cycle emissions of incineration compared to landfill where methane is captured, is there much of a comparison there? Because what we have heard from our government departments and regulators today is that we obviously have to move away from landfill, and waste-to-energy is the better alternative. Do you have much comment in regard to that?

Janek VÄHK: Yes, absolutely. There have been many recent papers, including the one I mentioned from SystemiQ, but also from us. We have done one also in the context of our work on methane. What is really important is we do not recommend focusing on methane capture from landfills. We really recommend treating the waste before it is landfilled, because if you treat the waste before you landfill it, it does not produce methane, and you can have an active biocover for any kind of residual methane emissions coming from the waste that you landfill. By doing so, you actually eliminate 95 per cent of emissions. In turn, if you focus on gas caps and not pre-treating the waste before landfilling, you often only end up capturing something like 50, 60, 70 per cent. For example, in the UK they believed they were capturing 80 per cent or 70 per cent, but actually they were only capturing 50 per cent. So if you compare pre-treating waste before landfilling, in combination with sorting out recyclables, that performs better than incineration, absolutely. There is no question on that. There have been recent papers, including the one from SystemiQ. In fact, they concluded that the MRBT system, together with advanced landfilling, performs similarly to having incineration with carbon capture, which is not going to be very likely, because there is no economic case to have organic capture in Europe, for example.

Rachel PAYNE: That is really interesting. Thank you. I might just, with the short amount of time I have left and if it is okay with the secretariat, put my questions to Dr Tait on notice. Thank you. Dr Zaman, obviously we are hearing that Australia has a waste problem, and when it comes to rolling out solutions to landfill, we have

been hearing that there are grave concerns about the safety and impacts on communities from waste-to-energy. Can you please highlight some of the ways Australia might better address our waste issue, increase compliance with the circular economy and reduce our dependence on landfill?

Atiq ZAMAN: Just to highlight, I think, some of my previous discussions about the health impact: I would like to highlight that in the proposed locations actually some of the emissions do not really meet – even with the best kind of emissions parameter – particularly hydrogen fluoride, particulate matter 10 and particulate matter 2.5, given that this is a highly industrialised area, meaning that this area and the residents are already exposed to those, let us say, three parameters, because these three parameters do not comply with the existing conditions, and this waste incineration plant will actually intensify these three parameters even more. As an environmental engineer I cannot say, you know, how it will actually have health impacts. Maybe Peter and Janek can have input, but they already have actually put forward on that one. But my main concern is, given that this area, the location, is already exposed to hydrogen fluoride and PM10 and PM2.5, waste-to-energy actually intensifies this problem.

Now, with the circular economy, what are then the best options that we have for actually diverting the waste from landfill? At least as an immigrant and also a PhD student I came to Australia in 2010, and I have been working in this space for the last 15, 16 years. What I can actually translate based on my understanding on Australian practice is we actually, as a nation, never put forward the solution that we need – and it started in 2018; that is my understanding – because of all of our waste was being handled offshore in China. In 2018 we started that. I can see that there is a great movement that has happened. A lot of facilities are actually developing in Australia, so this is the right time to actually focus on a circular economy solution rather than something that actually slows the whole process. In that context, for example, how can we actually reuse our materials within the society? How can we educate our civil society so that we can actually recycle correctly? We have high-value product which has a market, and it is actually happening – it is not like I am talking in a hypothetical sense. If you look into even our national waste management report, it shows that we are on the right track. Yes, we have a problem, but we are going on the right track. This sort of solution actually would jeopardise the whole intention, when we have a national framework actually going for that.

On top of that, what is problematic with that is we have national food organics and garden organics programs, FOGO, and waste-to-energy facilities like these actually hinder that – not to roll out FOGO. One of the main problems with that is, as Janek and also Peter mentioned, the methane gas emissions and all sorts of things. But we can actually promote bioenergy, like anaerobic digestion, and one of our studies is actually on how to decarbonise heavy industry like bricks and many similar sorts of industries. Methane gas would be a very good substitute to decarbonise heavy industries like the brick industry. So why don't we actually divert our food organics and garden organics from landfill? Then that would be a nice output for decarbonising heavy industry. So we are not just solving our waste and landfill problem, but we are also addressing our heavy industry solution that we need. And it is already proven. We have done life cycle assessments under one of the national projects, a national sustainable built environment research project. We have done a comprehensive LCA with brick manufacturing and how an alternate kind of energy source like biomethane can reduce 60 to 70 per cent of the emissions from the brick industry, heavy industry. So we can see a lot of potential to have more circular-economy relevant strategy programs, and I think Victoria is one of the states that all other states would be looking to for that, rather than going back to something that will diminish all the positive intentions that we have today.

Rachel PAYNE: Great. Thank you so much.

The CHAIR: Thank you so much. That is all we have time for today. You will receive some questions on notice from the committee staff, but I just really want to thank you for coming along and sharing your perspectives and information. That was really, really great. That concludes the public hearing and the inquiry.

Committee adjourned.