Submission No 224

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

Organisation: Veolia Australia and New Zealand

Date Received: 31 October 2025

31 Oct 2025

Select Committee on Proposed Energy from Waste Facilities
via online

Dear Chair,

Veolia welcomes the opportunity to provide input to the **New South Wales Parliamentary Select Committee's inquiry into proposed Energy from Waste facilities.** Our response to the inquiry's Terms of Reference is attached to this letter.

Veolia is a global leader in water, waste, and energy management. The group has nearly 220,000 employees worldwide, including 7,000 employees in Australia and New Zealand across 300 locations. We bring to Australia decades of global experience in energy recovery, operating more than 65 Energy from Waste (EfW) facilities worldwide. In Australia, Veolia is developing two flagship EfW projects, including Woodlawn Advanced Energy Recovery Centre (ARC).

New South Wales (NSW) is facing a waste crisis. There is simply not enough waste infrastructure in Greater Sydney to meet the demands of a growing population, with landfill capacity projected to run out by 2030.[1]

By 2030, landfills servicing Greater Sydney's households and businesses are estimated to be in shortfall by 1.1 million tonnes annually, forcing more waste volumes to be transported long distances for processing and disposal. This could increase household waste management costs by 20% on average, intensifying cost-of-living pressures.[2]

Our fundamental position is that EfW is a proven technology that when operated to international best practice emissions controls, such as those used by Veolia, is environmentally, chemically, atmospherically, and operationally safe. In addition, like other parts of the developed world, these facilities will become an important part of a sustainable waste and recovery approach for Australia.

If built, the Woodlawn ARC will provide an essential public service for NSW: a safe, modern way to manage the non-recyclable residuals that will persist even as waste avoidance and recycling continue to grow. This facility alone will have capacity to divert 380,000 tonnes annually from landfill, and play a vital role in solving Sydney's waste crisis.

[1] NSW EPA, 2025, Sydney landfill shortage, 27 June 2025
[2] NSW EPA, 2025, Sydney landfill shortage, 27 June 2025

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Our $600 million capital investment would also power around 40,000 homes, create 300 jobs during construction with 50 ongoing jobs expected to come from the local community plus indirect local jobs. During operation, the local economy would be boosted annually by $7 million to households and $37 million into the community through local shops and businesses.[3]

We believe EfW should play a role in a circular economy, but should not replace higher order waste management strategies such as reuse and recycling. Consistent with the waste hierarchy, EfW is a better alternative to landfilling non-recyclable materials due to greater emissions control, reduced odour, and the residual value including energy, aggregates, and metals, which can be derived through the treatment process.

As proponents, we will continue to work diligently with local communities to foster confidence — that we are committed to responsible development and have adhered to the NSW Government's sensible requirements at every stage. This includes preparing a full Environmental Impact Statement, commissioning independent environmental and human health risk assessments, designing continuous emissions monitoring, and committing to transparent, ongoing EPA oversight. Those assessments indicate the project's predicted risks to people, produce, soils, and water are negligible.

We are committed to continue working with all members of the Tarago and surrounding communities through employment opportunities, ongoing dialogue through regular community liaison committee meetings, supporting local community groups, and providing regular updates on plant and site performance including real-time monitoring. For example, we provide grants through the Veolia Mulwaree Trust, established in 2005, and regularly provide opportunities for the community to ask us questions and meet with experts and other communities internationally living near EfW plants. I have attached a summary of our engagement activities (Attachment 2).

Navigating complex discussions such as these are challenging. We ask you to take a balanced approach in considering all views informed by robust evidence, such as the NSW Chief Scientist and Engineer's findings and advice on EfW, international experience, and independent expert assessments of ours and other EfW projects.

[3] Veolia, 2022, Woodlawn Advanced Energy Recovery Centre: Community Guide to the Environmental Impact Statement (EIS)

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Thank you again for the opportunity to provide feedback. Should you have any questions or require clarification on our submission, please contact Megan Surawski, Veolia's Head of Government Relations and Stakeholder Engagement, at

Yours faithfully,

RICHARD KIRKMAN
CEO and Managing Director

Veolia Australia and New Zealand

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Veolia's response to the New South Wales Select Committee inquiry into proposed Energy from Waste facilities

Introduction

Veolia is a global leader in Energy from Waste (EfW) technology operating 65 facilities globally. It is from this position of international expertise that we are providing our submission to the *New South Wales (NSW) Parliamentary Select Committee on Proposed Energy from Waste Facilities*.

We recognise there are concerns among some of the community about EfW. We are committed to continuing to listen, work, and invest in Tarago and the surrounding communities and ensure the amenity, agriculture, and ecosystems of the area.[4] Our submission highlights the role EfW could play in NSW, provides scientific evidence on EfW facility operations and environmental impacts, and highlights the work we have done, and will continue to do, to ensure the Woodlawn ARC operates to world's best practice and does not damage the local community and environment.

However, we are concerned about the level of misinformation and misunderstanding about EfW and its potential impacts and role in the circular economy. We hope our submission assists the Committee's understanding of EfW.

Energy from Waste

It is important to distinguish between EfW (energy recovery) from incineration.

The New South Wales Environment Protection Authority's (NSW EPA) *Energy from Waste Policy Statement* defines EfW as thermal treatment of any waste or waste-derived materials to recover their energy content for electricity, heat, or both.[5] This definition does not include incineration to destroy waste or thermal treatment of hazardous waste materials, such as biological medical waste.

The distinction is critical as often the term 'incineration' is used as a catch-all term for both energy from waste and waste destruction, because a thermal combustion process is common to both. In Australia, 'incineration' often refers to older, less controlled technologies that, unlike EfW, do not use the stringent emission or residue controls, maximise recovery, or convert residual heat into a valuable energy source as is the case for EfW.

[4] See Appendix 2 to this submission
[5] NSW EPA, 2021, Energy from Waste Policy Statement

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Why energy from waste?

NSW is facing a waste crisis. There is not enough waste infrastructure in Greater Sydney to meet the demands of a growing population. By 2030, landfills servicing greater Sydney's households and businesses are estimated to be in shortfall by 1.1 million tonnes each year, forcing more waste volumes to be transported long distances for processing and disposal.[6] This could increase household waste management costs by 20% on average, intensifying cost-of-living pressures.[7]

If built, the Woodlawn ARC will provide an essential public service for NSW: a safe, modern way to manage the non-recyclable residuals that will persist even as waste avoidance and recycling continue to grow.

Energy from waste and the circular economy

EfW is not a substitute for recycling; it is a better alternative to landfilling what cannot be recycled — recovering energy, capturing metals, reusing aggregates (e.g. glass, stones, grit), and delivering reliable, local power while shrinking the landfill burden. It therefore has an important role to play in achieving a circular economy and supporting the global transition to net zero by 2050.

The role of energy recovery (EfW) forms part of the waste hierarchy, which is enshrined in NSW legislation, the *Waste Avoidance and Resource Recovery Act 2011* (NSW).[8,9]

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[6] NSW EPA, 2025, Sydney landfill shortage, last updated 27 June 2025; NSW EPA, 2024, NSW Landfill and recycling facts, November 2024

[7] NSW EPA, 2025, Sydney landfill shortage, last updated 27 June 2025

[8] NSW Government, *Waste Avoidance and Resource Recovery Act 2011*

[9] The waste hierarchy is standard across all waste management systems. For example:

- United Kingdom: The Waste (England and Wales) Regulation 2011
- European Union: Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, Official Journal of the European Union, see also European Union, Waste Framework Directive: The law is the legal framework for waste prevention and management in the EU

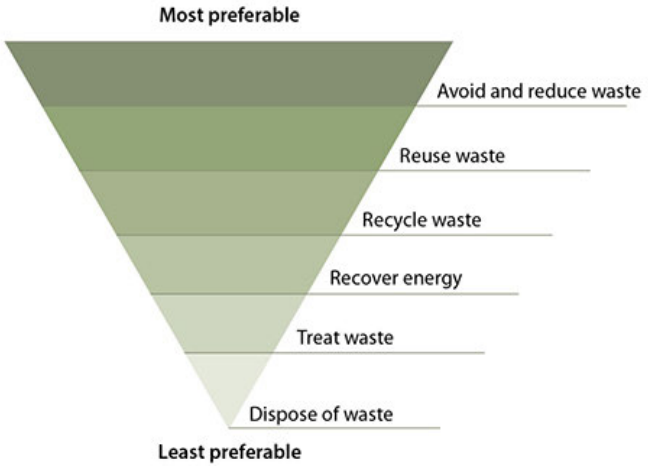

Figure 1: NSW EPA's waste hierarchy[10]

Under the waste hierarchy, energy recovery is not and should not be at the expense of higher order objectives such as reuse or recycling, but it does play a role in complementing them and, therefore, is part of a circular economy.

EfW does not inhibit recycling. In fact, jurisdictions with the highest recycling rates globally use EfW to manage waste. This is the case in many European countries, which have been building circular economies incorporating EfW since the 1970s.[11] The result is countries with high recycling and reuse with EfW means less than 1% of waste goes to landfill.[12]

A key driver of high levels of recycling, reuse, and recovery in Europe is limited land available for landfilling. This is analogous to the situation facing Greater Sydney. As long as landfilling remains the lower cost option, reuse, recycling, and recovery rates will remain low. Compared to EfW waste, these landfills, particularly smaller landfills, are likely to have greater long-term environmental, community, and agriculture impacts, and

[10] NSW EPA, 2022, The waste hierarchy, last updated 20 October 2022
[11] Oldenziel, R and H Weber, 2013, Introduction: Reconsidering recycling, *Contemporary European History* 22(3)
[12] European Environment Agency, 2025:
- Germany: Waste management country profile with a focus on municipal and packaging waste
- France: Waste management country profile with a focus on municipal and packaging waste
- Denmark: Waste management country profile with a focus on municipal and packaging waste

See also: Sandhi, S and J Rosenlund (2024), Municipal solid waste management in Scandinavia and key factors for improved waste segregation: A review, *Cleaner Waste Systems*, Vol 8, August 2024, 100144.

delay the move to greater circularity in Australia's economy. This is the choice NSW faces.

Electricity is not the only recovery opportunity from an EfW plant. Other recovery opportunities from EfW facilities are metals recovery, which can be used as inputs to other manufacturing processes, and heat. EfW facilities in Europe contribute to emissions reduction and lower household energy costs by supplying district heating.[13] The Woodlawn ARC's heat could also be recovered and used as an input to other processes such as food production, for example aquaculture or glass house grown vegetables.[14]

Previous inquiries and reports - 2018 NSW Energy from Waste Inquiry and 2020 Chief Scientist and Engineer Report

In 2018, the NSW Parliament's Portfolio Committee No.6 Planning and Environment undertook a review of EfW technology responding to concerns about the proposed Eastern Creek EfW facility.[15] The 2018 inquiry's terms of reference were similar to this inquiry's, covering international emission standards, technology, environmental and human health impacts, and alternative waste management solutions such as recycling.[16] The NSW Government took on board the Committee's findings and requested the NSW Chief Scientist and Engineer to prepare a report "to review EfW in NSW to ensure proposals adopt international best practice standards and controls to protect human health and the environment".[17,18]

The resulting 2020 report by the NSW Chief Scientist and Engineer found that compared to other national and international jurisdictions for EfW plants, the NSW EPA's draft

[13] Nordic Council of Ministers, 2024, Waste incineration in the Nordic countries: A status assessment with regard to emissions and recycling; Vares, S, K Klobut, and A Itänen, 2014, Waste as as source for district heat production and greenhouse gas reduction: a case study, *WIT Transactions on Ecology and the Environment*, 186:831 - 841,
[14] Rezaei, F et al, 2024, Spatial optimization of industrial symbiosis for heat supply of agricultural greenhouses, *Journal of Industrial Ecology*, 28: 1507-1523
[15] NSW Legislative Council Portfolio Committee No.6 - Planning and Environment, 2017, 'Energy from Waste Technology' inquiry
[16] NSW Legislative Council Portfolio Committee No.6 - Planning and Environment, 2017, Terms of Reference, NSW Parliament
[17] NSW Legislative Council Portfolio Committee No.6 - Planning and Environment, 2018, 'Energy from Waste' technology - Final report, NSW Parliament
[18] NSW Government, 2018, NSW Government response to the recommendations from the "Energy from Waste Technology" Parliamentary Inquiry, the Hon. Gabrielle Upton MP, Minister for the Environment, Minister for Local Government, Minister for Heritage by letter 17 September 2018

limits were equal to or more stringent in eight of the ten pollutant categories, and recommended:[19]

- alignment with the European Union's (EU) Best Available Techniques (BAT), released in 2019.[20]
- making the explanatory guide to the assessment requirements and regulatory processes for EfW projects in NSW available on relevant agency websites.
- including explicit requirements for Other Than Normal Operating Conditions for start up, shut down, and maintenance periods the the draft NSW EPA average periods and exceedance.
- making emissions data publicly available in real time and online for transparency and to contribute to informed public discussions about relative source and scale of emissions from human and natural sources.
- addressing potential health impacts through requirements such as the human health risk assessment (HHRA) process and consider food as an exposure pathway.

Energy from Waste technology including performance and international examples

The proposed Woodlawn facility will use the same thermal technology used in modern state-of-the-art facilities internationally.

Importantly, today's facilities use filters and temperatures that minimise emissions to the environment. Research into communities near EfW facilities indicates the emissions produced do not pose a threat to human health, soil, water, or agriculture.

Under NSW's EfW Policy and Framework, a proposed facility must be benchmarked to a reference plant of comparable scale and performance.[21] This gives the government and the community confidence that the proposal can meet strict emissions limits and protect air quality, human health, and the environment.

Veolia used the Staffordshire EfW facility in the United Kingdom (UK) as the reference facility given the proposed Woodlawn ARC is of similar size and located near a population centre. The Staffordshire reference facility is permitted and operated under

[19] NSW Chief Scientist & Engineer, 2020, *Energy from Waste: report from the NSW Chief Scientist & Engineer May 2020 with additional advice as at November 2020*, NSW Government
[20] The BAT for EfW: Neuwahl, F et al, 2019, Best Available Techniques (BAT) Reference document for Waste Incineration: Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control), Joint Research Council Science for Policy Report, European Commission, EU29971
[21] NSW EPA, 2021, Guide to the NSW Energy from Waste framework, NSW Government

the EU's Industrial Emissions Directive (IED) and the 2019 Best Available Techniques Conclusions for Waste Incineration (BATC).[22, 23] These standards are the basis for permitting EfW facilities in Queensland, Western Australia, and Victoria and are considered to be the most stringent used internationally.[24]

The IED aims to minimise the impact of pollution on people's health and the environment by reducing harmful industrial emissions. Regulating over 52,000 large scale facilities including landfills, its key objectives and requirements include:

- promoting innovation and transformation through the most effective viable emissions reduction techniques by allowing flexibility in permits to test and deploy emerging techniques.
- setting tight rules for reducing emissions through strict emission limit values.
- providing strong tools for the circular economy and resource efficiency, and reducing hazardous chemical use.
- permits must contain binding quantitative resource efficiency requirements for materials, water, and energy (as appropriate) to better address water scarcity and waste generation.
- emphasises using the BATs to ensure safety of human health.

The BATs are the most environmentally effective, and economically and technically viable systems for preventing and controlling emissions. They are determined through a collaborative, transparent process managed by the European Commission's Bureau for Research on Industrial Transformation and Emissions.[25] The process results in BAT and their reference documents known as BREFs, which then inform BAT Conclusions (BATCs) used as the basis for drafting permit conditions.[26] The Woodlawn ARC's combustion controls, multi-stage flue-gas treatment, and continuous emissions

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[22] European Union, Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), Official Journal of the European Union.

[23] European Union, 2019, Commission Implementing Decision (E) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration, Official Journal of the European Union

[24] Hodgkinson, I et al, 2021, Mini-review of waste-to-energy related air pollution and their limit value regulations in an international comparison, *Waste Management & Research: The Journal for a Sustainable Circular Economy,* Vol 40 (7), NSW Chief Scientist & Engineer, 2020, *Energy from Waste: report from the NSW Chief Scientist & Engineer May 2020 with additional advice as at November 2020*, NSW Government

[25] European Bureau for Research on Industrial Transformation and Emissions, The Sevilla Process: Science at the heart of EU Policy.

[26] European Bureau for Research on Industrial Transformation and Emissions, BAT reference documents

monitoring system (CEMS) are designed to meet the latest BREF and BATC for EfW facilities in Europe.

International policies on Energy from Waste

Critics of EfW sometimes argue this technology is no longer being supported by OECD governments and new plants are not being built due to concerns about their negative environmental impacts and, therefore, should not be allowed in Australia.[27] Our review indicates the opposite.

Broader research reveals that EU member states are not walking away from EfW as a technology for managing non-recyclable, residual waste. In fact, circular economy, energy, and net zero transition policies all identify EfW as having a role to play. It is a similar situation in the UK.

The 2017 European Commission communication on Waste to Energy in the circular economy states that EfW has a role to play where it is consistent with the waste hierarchy and reuse and recycling is prioritised.[28] The communication states this approach will maximise greenhouse gas savings and resource use across the European economy.[29] The communication does not find EfW is a hazardous technology nor does it suggest a blanket ban on EfW facilities. Rather, it suggests no more plants be built in a member state w*here there are sufficient facilities to manage the volumes of residual, non-recyclable waste*.

The UK announcement of tighter standards for EfW facilities in late 2024 applies to capacity and not air quality or impacts.[30] The focus is to encourage diverting more non-municipal wastes from landfill. It does not operate to ban EfW but that if more capacity is needed, higher efficiency including heat recovery, and carbon capture ready

[27] See Toxic Free Australia: "While Europe moves away from waste incineration in recognition that it undermines a Circular Economy and is a major climate threat, the industry is looking for new markets in the global south and has set Australia and New Zealand in their sights", https://www.toxicsfreeaustralia.org.au/our-work/incineration/.

[28] European Commission, 2017, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The role of waste-to-energy in the circular economy, 26.1.2017 COM(2017) 34 final

[29] NB: the communication does recommend a moratorium on new EfW plants *where a member state has enough plants to manage residual waste.* We do not oppose this as it is consistent with the waste hierarchy and EfW over capacity would likely result in stranded assets for governments and companies alike.

[30] Department for Environment, Food & Rural Affairs, 2024, Residual waste infrastructure capacity note, UK Government, 30 December 2024

plants will be supported. The UK Government is providing funding for EfW plants with carbon capture and storage capacity as part of establishing low carbon industrial areas.[31]

Critics also suggest that European funds are discontinuing finance for new EfW plants. This is not unexpected given Europe has used this technology for decades, and there are enough plants to manage the expected levels of residual, non-recyclable waste as recycling and diversion rates increase among member states.

Air Emissions

The stack emissions from an EfW facility consist primarily of components that are already present in the atmosphere we breathe. Specifically, approximately 99.9% of stack emissions comprise normal atmospheric gases — nitrogen, oxygen, carbon dioxide, and argon, plus steam (water vapour), which is simply water in gaseous form.[32]

The remaining fraction, less than 0.1%, includes monitored trace pollutants such as sulphur dioxide, a substance commonly used as a food preservative that is regulated to ensure it remains at safe levels. These trace pollutants are monitored and reported on as part of the continuous emissions monitoring system in line with the licence requirements of EfW facilities. During colder months, water vapour (steam) from the stack condenses in the cooler air and resembles smoke. This cloud is similar to the steam visible from a kettle. This visual effect does not indicate the presence of harmful pollutants.

The Woodlawn ARC is designed as an IED/BAT-compliant plant. These EU standards are designed to protect the air quality of the surrounding area. The NSW EPA's emission limits draw on the IED/BAT standards. In 2025, the NSW Chief Scientist and Engineer advised the Government that the NSW EPA's emission limits are among the most internationally stringent and consistent with the EU standards.[33] Our Woodlawn facility will meet these requirements.

Under NSW's EfW Policy, "quality of emissions" is demonstrated by meeting strict emission limit values (ELVs) and using NSW EPA approved methods to confirm ground-level concentrations at homes, schools, and farms remain safely within health-based criteria. For the Woodlawn ARC, the Secretary's Environmental Assessment

[31] Department for Environment, Food & Rural Affairs, 2024, Government to crack down on waste incinerators with stricter standards for new builds - press release, UK Government
[32] Covanta White Paper, 2019, Energy-from-waste emissions, Working Paper 4
[33] Office of the Chief Scientist & Engineer, 2025, International practice standards and controls for energy from waste facilities: updated advice to NSW Government, 7 April 2025

Requirements (SEARs) directed a full Air Quality Impact Assessment using NSW's approved methods.[34]

The project's Air Quality Impact Assessment (AQIA) and HHRA were prepared using these NSW EPA approved methods and confirm that predicted concentrations at homes, schools, and farms will be negligible and well within NSW health-based criteria. These emissions will be kept low and controlled by:

- **design:** high-temperature, well-controlled combustion, multi-stage flue-gas cleaning of particulates and NOx, and acid gases adsorption for trace pollutants.
- **law:** NSW EPA-set ELVs cap what can leave the stack.
- **measurement:** continuous in-stack CEMS for key pollutants and parameters, plus periodic third-party independent stack tests, and an ambient air monitoring program to verify dispersion results.

Veolia will implement additional ambient monitoring over and above what is required by the NSW EPA regulations and consistent with the NSW Chief Scientist's 2018 report findings. This is to ensure transparent, ongoing verification during commissioning and operation to strengthen community confidence that we are committed to protecting human health and environment and meeting our regulatory obligations.

We will install and operate four real-time ambient air quality monitoring stations. The locations will be identified through field investigations and instrument siting requirements as set out in our AQIA. These stations will be in addition to two meteorological monitoring stations installed in Tarago in May 2023, and a third at the Eco Precinct.

We will also develop a detailed Emission Deposition Soil Sampling Analysis and Quality Plan. This detailed plan will be used to monitor ecological and agricultural receptors within the vicinity of the Woodlawn ARC facility. The plan will be based on obtaining a robust background sample data set from quarantined sample sites for the operational life of the Woodlawn ARC.

Human health impacts

Many critics argue EfW facilities present a significant risk to human health, and new plants should not be approved because the future impacts on health are unknown and therefore the precautionary principle should be applied. This is based on the argument

[34] NSW Government, Protection of the Environment Operations (Clean Air) Regulation 2010

that if older EfW facilities were built to standards of the day and resulted in pollution, then the same thing could happen today despite the tighter constraints.

Many advocacy organisations point to research on the health impacts of EfW by analysing older facilities, including those established in the 1960s and 1970s.[35] Improvements in technology and monitoring have expanded our understanding of air emissions and are incorporated into air quality protections such as the IED and BATs. In Europe, facilities are required to be retrofitted to meet any new emission standards.

A review of recent literature analysing the impact of EfW on human health indicates making a causal connection between EfW plants and negative health impacts is difficult given background exposure and other potential sources.[36] For example:

- a 2025 study confirmed "results of other health surveillance lines, showing no evident harmful effects" of a modern EfW facility operating near Turin, Italy. It further cautioned attribution of other health outcomes such as reproductive and cardiac incidents in the wider surrounding area.[37]

- a 2019 study of a new EfW facility operating to IED standards showed there was no increased risk from particulate matter to reproduction or early life for women and children living nearby.[38]

- evidence remains weak between cardiovascular, respiratory, and non-Hodgkin's lymphoma, with no clear association observed for pregnancy outcomes, or other cancer types.

- a systematic review of epidemiological studies by the UK Government found that currently "...there is no clear evidence for associations between exposure to emissions from modern, well-regulated municipal waste incinerators and morbidity, cancers, or adverse birth outcomes, and these incinerators only make a small contribution to local concentrations of air pollutants when compared to other sources of air pollution."[39]

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[35] Tait, P et al, 2020, The health impacts of waste incineration: a systematic review, *Australian and New Zealand Journal of Public Health* 44(1), Vol 44(1), February 2020, p 40-48
[36] Cole-Hunter, T et al, 2020, The health impacts of waste-to-energy emissions: a systematic review of the literature, *Environmental Research Letters* 15, 123006
[37] Gandini, M et al, 2025, Long-term health effects of a third-generation waste-to-energy plant: the experience of Turin (Italy), *European Journal of Public Health* 35(3), June 2025, pp 576-581
[38] Ghosh, R E, et al, 2019, Fetal growth, stillbirth, infant mortality and other birth outcomes near UK municipal waste incinerators; retrospective population based cohort and case-control study, *Environment International* 122, January 2019, Pages 151-158
[39] UK Health Security Agency, 2025, Epidemiological evidence review in the UK and EU, following implementation of the Waste Incineration Directive, updated 9 June 2025, UK Government

Studies such as these also emphasise that other researchers should not use findings of marginally higher levels of health incidents nearer to an EfW facility given the difficulties of attribution, especially if findings of older studies are used as evidence of risks from newer technologies. This highlights the problem with reviews such as that by Peter Tait et al,[40] which tend to rely heavily on pre-2010 studies using data stretching back to the 1970s, where separating attribution is even more difficult given poorer air quality protection across the board.[41]

The impact on human health from the proposed EfW facility's air emissions must be considered in context, as seen in Figure 2 below. With strict limits as required by the NSW Government and using international best practice emissions controls, Figure 2 shows that EfW facilities have ***less*** impact on human health compared to wood heaters, small engines, and vehicles. For furans and dioxins especially, it is clear emissions from internal wood heaters pose a greater risk to human health than an EfW facility cumulatively and at a point in time.

[40] Tait, P et al, 2020, The health impacts of waste incineration: a systematic review, *Australian and New Zealand Journal of Public Health* 44(1), Vol 44(1), February 2020, p 40-48
[41] de Titto, E and A Savino, 2019, Environmental and health risks related to waste incineration, *Waste Management & Research: The Journal for a Sustainable Circular Economy*, 37(10)

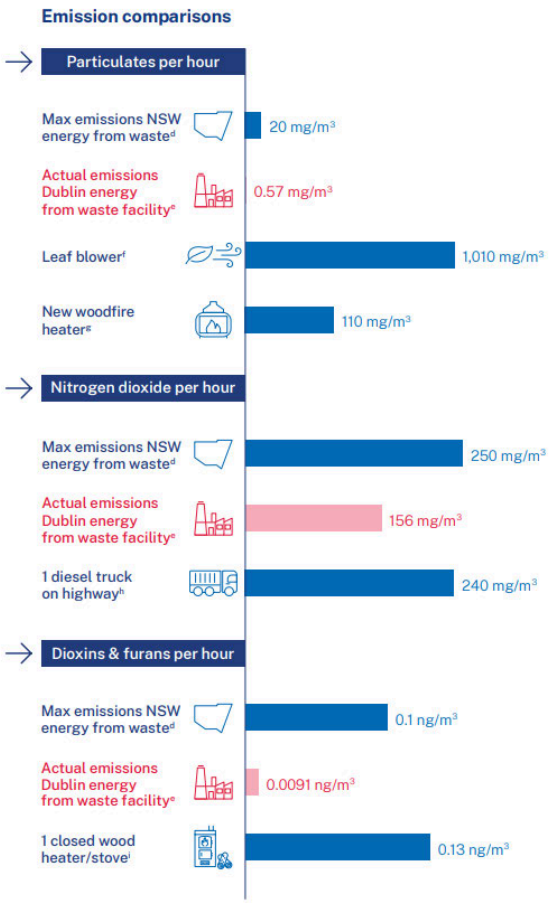

Figure 2: Emissions comparison, NSW Government[42]

The NSW EfW framework takes a precautionary approach by establishing emission limits and design requirements that are specifically designed to address concerns raised by non-government advocacy organisations and surrounding communities. For example, the Public Health Association of Australia's fundamental premise is that EfW facilities should be appropriately conditioned for protecting human health using the precautionary principle.[43] Further, impact of EfW facilities should be monitored over time and researchers should consider study design and methods so results are easier to compare. It does not state there should be an outright moratorium.

Veolia's HHRA for Woodlawn ARC assessed a highly conservative "worst-case" acute and chronic exposure using NSW and national methods. It assumed continuous deposition

[42] NSW EPA, 2025, Energy from waste fact sheet, accessed 28 October 2025
[43] Public Health Association of Australia, 2024, Waste Incineration: Policy Position Statement, Canberra

and 70 years of exposure (24 hours a day, every day). The conclusion is consistent across pathways: risks are negligible.

- **rainwater tanks and groundwater:** The HHRA modelled deposition onto roofs at the most-exposed homes and compared predicted tank concentrations with Australian Drinking Water Guidelines.
    - Even with conservative assumptions of no first flush and 100% roof dust wash-off, predicted levels are well within health-protective limits and typically below lab detection. Incremental groundwater risk is negligible, given very low solubility for key organics and very small changes in soil metals.
- **recreational waters (Lake George and Lake Bathurst):** Greater distances and large "mixing volumes" mean predicted concentrations are even lower than tanks and well within relevant guidelines.
- **soil and produce:** No measurable change in soil quality is expected; predicted concentrations in locally grown food remain well below food-standard limits. Organic produce status is unaffected.
- **site water management:** the Woodlawn ARC, separate to the landfill, is designed as a zero-discharge facility, further reducing off-site pathways. Performance will be verified under an EPA licence with ongoing monitoring.

Agricultural impacts

Veolia understands and recognises how important food, fibre, and wine production is to the identity and economy of the surrounding communities.

Independent risk assessments have concluded the Woodlawn ARC will not adversely affect agricultural land uses or production.

The NSW Department of Primary Industries (DPI) reviewed the Woodlawn ARC proposal. Their assessment of the project was that it "demonstrated that there will not be an adverse impact on any agricultural land use or agricultural production."[44]

Our revised HHRA modelled conservative "worst-case" scenarios over decades. It found the Woodlawn ARC project would not result in any measurable impact on produce grown in the local area and:

[44] Department of Primary Industries - Agriculture, 8 December 2022, Letter to Department of Planning and Environment regarding Woodlawn Advanced Energy Recovery Centre (SSD-21184278)

- no measurable change in soil quality and no detectable change in produce attributable to ARC emissions.
- compliance with Food Standards Code limits is maintained for crops.
- calculated concentrations for meat, milk and eggs are well below international limits for dioxin-like compounds.

To provide transparency and verification, Veolia will also operate continuous real-time ambient air quality monitoring consistent with the NSW EfW Policy. When the DPI's assessment and the HHRA's conservative findings are combined with our monitoring commitments and distance from wineries we are confident the Woodlawn ARC will not affect the quality, safety, marketability, or organic status of agricultural products grown locally or in the wider region.

Australian and international critics frequently point to a French health agency's 2023 investigation into EfW's impact on backyard eggs in Ivry-sur-Seine, Île-de-France (Greater Paris Region) as proof EfW facility emissions contaminate food and agricultural systems more broadly with dioxins jeopardising human health.[45]

In 2022, a report by the environmental non-government organisation Toxicowatch attributed high dioxin levels in backyard eggs, pine needles, and tree leaves to the nearby Ivry XIII EfW plant.[46, 47,48] In response, the Île-de-France Regional Health Agency (ARS-IDF) committed to conduct a study on three types of persistent organic pollutants (POPs), dioxins, furans, and polychlorinated biphenyls, to see if there was a risk to human health from eating backyard and locally farmed eggs.

The ARS-IDF study's findings include:

- urban soils are globally contaminated by POPs, regardless of proximity to incinerators.
- EfW plants may contribute to POP loads, but only as one of several sources that have existed for up to 100 years previously including construction,

[45] Agence Régionale de Santé, 2023, Contamination des œufs de poules par des polluants organiques persistants Étude dans 25 poulaillers domestiques en Île-de-France, République Française
[46] Toxicowatch, 2021, Biomonitoring research Paris, Ivry-sur-Seine 2021, accessed 23 October 2025
[47] The Ivry XIII EfW Plant is operated by Suez. In France, Suez is a different corporate entity to the Australian Suez operation, which was acquired by Veolia in 2022.
[48] The original Ivry XII plant was commissioned in 1969 and prior to ceasing operating in 2023, was upgraded in 2005 to meet stronger emission controls. Plants in the EU and UK are required to upgrade emission controls when new levels are introduced improving their environmental performance over time.

manufacturing, and more recently, vehicle emissions. Therefore, the exact share EfW plants are responsible for cannot be quantified.

- there is no causal link between proximity to EfW plants and the concentration of POPs in soils or eggs. In some cases, sample sites close to EfW plants showed lower levels of POPs than more distant sites.

- the presence of POPs in domestic (backyard) eggs is a diffuse environmental issue, reflecting the persistence of historical and current emissions in urban environments.

- the main exposure pathway for hens and their eggs is through soil, food, and water.

- using "good farming practices" recommended by Agence nationale de sécurité sanitaire (ANSES) of balanced feed, feeding in troughs, and avoiding ash on soil significantly reduces levels but does not fully prevent exceedances if the soils are heavily polluted, which could be from multiple sources.[49]

- professional poultry keepers tend to have lower contamination levels than private individuals, possibly due to stricter hygiene and feeding practices, which increases any risk that may be present in backyard eggs.

In response to the ARS-IDF's findings, the French Government's Ministry of Health emphasises there is no scientifically demonstrated causal link between EfW incinerators and POPs found in domestic eggs and urban soils.[50] This is because there are many different direct and indirect sources of POPs in the environment.

The French Government therefore takes a precautionary and preventive approach to EfW plants through continued regulation and modernisation to limit emissions. It encourages:

- monitoring and ongoing studies into POPs in urban environments.

- public information and awareness for households with domestic hens for eggs.

[49] Agence Régionale de Santé, 2023, Étude de la contamination des œufs de poules par des polluants organiques persistants dans 25 poulaillers domestiques en Île-de-France: Recommandations sanitaires
[50] Agence Régionale de Santé, 2025, Contamination of domestic eggs with persistent organic pollutants: results and recommendations from a poultry farm study

- using ANSES's recommendations to reduce exposure risk, noting risks come from multiple sources.[51]

In other words, findings from studies like Toxicowatch do not provide causal evidence that EfW plants are the primary source of POPs in nearby food production.

Therefore, a high performing EfW plant combined with monitoring, reporting, and verification, as proposed for the Woodlawn ARC, is the best practice approach to minimise any impact on food production, which could harm human or animal health.

Greenhouse gas performance

EfW facilities are highly efficient and have an important role to play in the transition to net zero and a circular economy. These facilities provide baseload power for stabilising the grid when used in conjunction with renewables and storage. However, critics raise concerns about the greenhouse gas performance of EfW facilities, often arguing they produce more carbon emissions than coal or gas electricity generation.

In Australia, any EfW facilities generating over 100,000 tonnes of carbon dioxide equivalent will be captured by the Safeguard Mechanism. This policy forms an important part of Australia's transition to a net zero economy by 2050.

Modern EfW facilities also demonstrated better greenhouse performance. For example, on a lifecycle basis, a landfill would need to capture well over 80% of its gas to achieve a similar emissions abatement performance[52]. To put these figures in context, an average NSW landfill captures around 40% of gas produced meaning 60% of landfill emissions are going into the atmosphere.[53]

The UK will also manage greenhouse gas emissions from EfW facilities. Its interim approach from 1 January 2026, is a requirement for energy emissions to be monitored, verified, and greenhouse gas emissions reported. These will then be covered by an emissions trading scheme starting on 1 January 2028.[54] This is similar to the next iteration of the EU Emissions Trading Scheme, which will require EfW facilities to report their emissions ahead of potentially inclusion from 2028. Some member states already

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[51] Agence nationale de sécurité sanitaire, 2025, Domestic chicken coops and dioxins - Preventative recommendations; Santé Publique France, 2024, Exposure of the French population to polychlorinated biphenyls, dioxins and furans. National biomonitoring program, Esteban 2014-2016

[52] Anshassi, M et al, 2022, Life cycle GHG emissions of MSW landfilling versus Incineration: Expected outcomes based on US landfill gas collection regulations, *Waste Management* Vol 142, 1 April 2022, p.44-54

[53] NSW Department of Climate Change, Energy, the Environment and Waste, 2024, *NSW greenhouse gas emissions projections 2024: Methods paper*, NSW Government

[54] UK Government, 2025, UK Emissions Trading Scheme (UK ETS): a policy overview

require their EfW facilities to participate in the EU ETS. is proposing to apply EfW facilities from 2027 unless already captured due to a voluntary inclusion such as in Denmark.[55]

Often greenhouse gas claims in Australia ignore the opportunity for heat recovery from EfW, and how this output could be used as an input to other industrial applications. For example, at the Woodlawn ARC, the heat could be recovered for use in another process such as fish farming, or greenhouses for fruit or vegetable production. This approach is supported in the NSW Local Government Association's submission to NSW's April EfW consultation.[56]

Europe has long recognised the opportunity of heat recovery from EfW plants, which are used as a clean and energy efficient source of household and municipal heating, avoiding greenhouse emissions. For example, all of Paris' hospitals and many museums, including the Louvre, are heated by EfW plants.[57]

Managing Sydney's waste and in the Tarago area

The looming waste crisis for Greater Sydney urgently demands a portfolio of solutions. EfW is part of that portfolio.[58] NSW must keep pushing avoidance, reuse and recycling via regulated extended producer responsibility schemes, behaviour change, product design, diverting FOGO and other organics and new reprocessing capacity. But even high-performing systems retain a residual stream for decades. In integrated systems, energy recovery is not, does not, and should not replace recycling. Rather, it is to be limited to the non-recyclable fraction and is not a replacement for recycling.

In the waste hierarchy, EfW sits after avoidance, reuse, and recycling as "recovery," preferred to disposal. Our ask is a portfolio approach:

- Keep shifting materials up the hierarchy through policy and investment.
- Apply clear residual-only rules so EfW never competes with recycling.

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[55] European Commission, 2023, Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market in 2023 {SWD(2024) 264 final}

[56] Local Government NSW, 2025, NSW EPA Energy from Waste Framework & Options Paper - LGNSW Submission, Section 4 https://lgnsw.org.au/common/Uploaded%20files/Submissions/2025/Energy_From_Waste_Options_Paper.pdf

[57] Waste-to-Energy: Heating the Heart of Paris, Luc Valaize, President of the SVDU
The French Waste-to-Energy operators Association, presented by Hubert de Chefdebien, SVDU Board member

[58] New South Wales Environment Protection Authority, 2025, Sydney's landfill shortage, NSW landfill and recycling facts

- Use transparent monitoring and review so any material that becomes recyclable is redirected.

In this model, EfW provides a regulated back-stop for what cannot feasibly be recycled — ensuring landfill is not the default while recycling and reuse continue to scale.

Prior to 2005, the Woodlawn site was home to a lead, copper, and zinc mine. The closure of this mine posed significant environmental risks, where the void, and harmful mining by-products would not be remediated or managed. Through Veolia's careful management and investment for close to 20 years, these risks have been effectively managed by our local team. Environmental harm has been mitigated whilst providing a high performing, zero discharge landfill site for NSW.

Without our intervention, acid leachates would have likely have entered waterways and soils, contaminating the local landscape and posing significant risks to human health, ecosystems and food and fibre production.

Alternative solutions and how they should be tested

Under current NSW policy settings, there are only two lawful pathways for managing residual municipal waste: landfill or EfW. Sydney is running out of permitted landfill capacity. In any case, even if landfill were available, EfW is a better alternative. From time to time, proponents advance novel or "next-gen" technologies, such as municipal solid waste (MSW) gasification, and waste-to-fuels. However, these alternatives have struggled to operate reliably at commercial scale, meet environmental performance requirements, or make financial close.[59] It would be inappropriate to subject EfW alone to rigorous scrutiny while elevating unproven alternatives to equal footing without equivalent evidence.

EfW is new to Australia but proven at scale overseas. Any 'novel' alternative must meet the same standards as required for EfW before being considered a near-term substitute. At minimum, this means having demonstrated level 9 technology and commercial readiness level with continuous commercial operation on mixed MSW for multiple years under standards comparable to NSW.[60] It also requires whole-of-system proof — bankable offtake and residue pathways, credible availability, and economics — and evidence of social licence consistent with NSW expectations. Technologies that cannot

[59] Department for Business, Energy & Industrial Strategy, 2021, Advanced gasification technologies - review and benchmarking: Opportunities and barriers for next generation AGTs, Task 4 Report, BEIS Research Paper Number 2021/038

[60] Australian Renewable Energy Agency, 2014, Technology readiness levels for renewable energy sectors, Australian Government

show this record should not be elevated above EfW or used to defer action on Sydney's residual waste.

Finally, Veolia has no vested interest in any particular technology. We are selecting what works, what is most efficient, and what meets environmental standards.

Conclusion

In summary, EfW is a proven safe technology with an important role to play in managing waste in NSW and across Australia, alongside greater reuse and recycling. The NSW Government's framework is based on international best practice standards and regulation, and Veolia's proposal is designed to meet and protect the environment and human health.

We look forward to continuing to work with the Tarago and other local communities, and the NSW Government, to deliver this important project.

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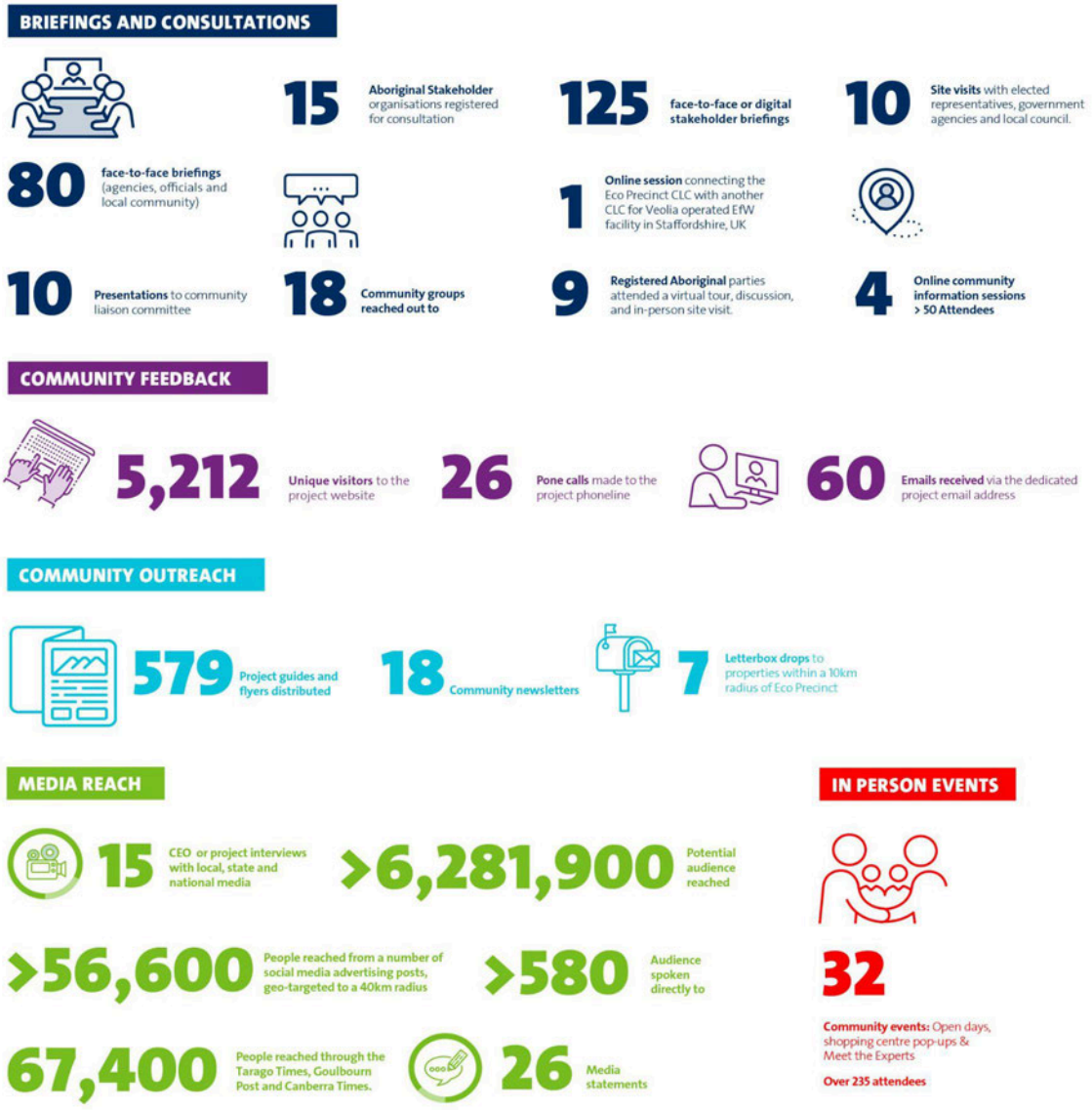
Attachment 2 - Summary of Veolia's community engagement



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