Submission No 376

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

Organisation: Public Health Association of Australia (PHAA)

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Public Health Association
AUSTRALIA

Public Health Association of Australia submission to the New South Wales Inquiry into proposed energy from waste facilities

Contact for recipient:
Select Committee on Proposed Energy from Waste Facilities
A: 6 Macquarie Street, Sydney NSW 2000
E:wasteenergy@parliament.nsw.gov.au
T: (02) 9230 2111

Contact for PHAA:
Terry Slevin – Chief Executive Officer
A: 20 Napier Close, Deakin ACT 2600
E: phaa@phaa.net.au **T:** (02) 6285 2373

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The **Public Health Association of Australia** (PHAA) is Australia's peak body on public health. We advocate for the health and well-being of all individuals in Australia.

We believe that health is a human right, a vital resource for everyday life, and a key factor in sustainability. The health status of all people is impacted by the social, commercial, cultural, political, environmental and economic determinants of health. Specific focus on these determinants is necessary to reduce the root causes of poor health and disease. These determinants underpin the strategic direction of PHAA. Our focus is not just on Australian residents and citizens, but extends to our regional neighbours. We see our well-being as connected to the global community, including those people fleeing violence and poverty, and seeking refuge and asylum in Australia.

Our mission is to promote better health outcomes through increased knowledge, better access and equity, evidence informed policy and effective population-based practice in public health.

Our vision is for a healthy population, a healthy nation and a healthy world, with all people living in an equitable society, underpinned by a well-functioning ecosystem and a healthy environment.

Traditional custodians - we acknowledge the traditional custodians of the lands on which we live and work. We pay respect to Aboriginal and Torres Strait Islander elders past, present and emerging and extend that respect to all other Aboriginal and Torres Strait Islander people.

Introduction

PHAA welcomes the opportunity to provide input to the New South Wales Parliament Select Committee on Proposed Energy from Waste Facilities Inquiry into proposed energy from waste facilities.

Please note that in this submission we use the expressions 'Waste to Energy' (WtE) and 'Energy from Waste' (EfW) as terms including waste incineration, principally of municipal solid waste (MSW).

Recommendations summary:

1. Community concerns about health, social and environmental effects are important both because of demonstrated effects and the mental health overlay concern about these facilities can cause. Local residents' concerns need to be taken seriously.
2. Implementation of the National Waste Policy and Action Plan needs to be prioritised to reduce the volume of waste needing disposal.
3. For these reasons, the New South Wales Government should proceed very cautiously with rolling out WtE facilities.
4. If waste incinerators are rolled out, strict regulation and monitoring of emissions, and of impacts on the regional environment, is required, and should be incorporated in licencing agreements.
5. If waste incinerators are rolled out, local communities should have real time access to the emissions monitoring reports of the facilitities.

PHAA draw the Inquiries attention to PHAA's Policy Position on Waste Incineration and Waste to Energy facilities. The key messages from that policy are:

- Waste incinerators are associated with health harms. Most harm occurs to workers, but more people in the surrounding are also affected. Since most toxins are ingested via food, adverse effects are not necessarily geographically co-located with incinerators.
- Most of the evidence for harm comes from research on older types of incinerators. Industry claims newer incinerators are better designed and safer. However, most have not been in operation long enough for evidence for or against their safety to emerge. Therefore, a precautionary approach is warranted.
- Existing research is of varying quality and subject to multiple confounders making comparison of incinerators and effects incomplete.

The policy also notes the following key issues:

1. Local residents' concerns about incinerators need to be taken seriously and addressed proactively.
2. Strict regulation and monitoring of incinerators and their emissions is required and needs to be incorporated in licencing agreements.
3. Future research should adhere to a standardised methodology that assesses factors, such as waste (including content and volume), incinerator technical characteristics (such as stack height, type of combustion chamber, stack cleaning mechanisms and maintenance schedules), and the types and quantities of emissions.
4. Where possible, analyse or control for three exposure pathways: ingestion, inhalation and dermal exposure. The possible lack of correlation between distance from the incinerator and the intensity of all three of the pathways should guide study design and interpretation of results.

PHAA Response to the Inquiry into proposed energy from waste facilities Terms of Reference

(1) That a select committee be established to inquire into and report on proposed energy from waste facilities, and in particular:

(b) the spread of the emissions predicted and the quality of emissions to be generated

This would require modelling by air quality experts and meteorologists. See also item (h) below.

(c) health impacts from currently operating older technology waste incinerators as compared to the proposed newer technology

The policy and the international literature reviews show that there are adverse health impacts from incinerators. Mostly these effects are from older designed and less well-regulated incinerators. However, newer regulation and more recently designed incinerators have not been in operation for long enough to be able to assess if they are less harmful that the older incinerators. The current lack of evidence does not indicate evidence of absence of harm but rather insufficient time for harms to be detectable. In this situation governments should follow to the precautionary principle.

A 2018 health effects literature review concluded that[1] :

There are significant risks associated with waste incineration as a form of waste management. Many older incinerators were linked with neoplasia, reproductive issues and other diseases. While the results were not consistent across the literature, based on a precautionary principle there is insufficient evidence to conclude that any incinerator is safe. There is some suggestion that newer incinerator technologies with robust maintenance schedules may be less harmful, but diseases from exposures tend to manifest only after many years of cumulative exposure, so it is premature to conclude that these newer technologies improve safety.

Incineration for waste management, including waste-to-energy options, is likely to remain an alternative that governments will consider. However, the financial and ecological costs of waste to energy are comparably high. Building reliance on a waste stream for energy counters the need to reduce waste overall. This review suggests that incineration is not without problems and so it is an option that needs to be pursued carefully with close monitoring. Local community groups have a basis for legitimate concern and so siting of incineration facilities needs to take these concerns into account. Early transparent consultation with communities about these facilities is essential.

A more recent review of the literature concluded[2] :

> "… we found an association with the development of lymphoproliferative disease, congenital abnormalities and acute asthma hospitalisations. However, it must be noted that only 33% of studies on direct health outcomes found an adverse effect."

[1] Tait PW, Brew J, Che A, Costanzo A, Danyluk A, Davis M, et al. The health impacts of waste incineration: a systematic review. Australian and New Zealand journal of public health. 2019

[2] Peter W. Tait, Jonathon King, Victoria Williamson, Joe Salmona, Mahakaran Sandhu, Thomas Guscott. Updating the Direct and Indirect Impacts of Waste to Energy Incineration of Municipal Solid Waste on Human Health, from 2018-2024

Most papers assessing surrogate markers of adverse health effects found evidence of potentially harmful exposures from MSWI, including 63% of papers assessing biomarker levels and 67% of papers analysing external exposure. Consequently, to reduce potential health impacts, efforts need to be taken to reduce exposure via all possible routes including treatment of fly ash and flue gas.

Whilst it appears that new incinerators have less detrimental health impacts, **the power of the result is decreased by the low number of studies and the fact that studies need to be over a long time period to identify such risks. It may be that it is too soon to definitively assess whether new designs and operating procedures are safer**. Accordingly, more long-term studies are required to measure the actual health impacts of newer incinerators.

The data results summary table from that study:

Incinerator Completion Period	No. studies that found risk or adverse effect (percentage of total studies)	No. studies that found no risk or adverse effect (perentage of total studies)	No. studies that were inconclusive on risk or adverse health effect (percentage of total studies)	No. Total Studies
Before 2000	1 (13%)	5 (62%)	2 (25%)	8
Between 2000-2010	11 (65%)	6 (35%)	0	17
After 2010	1 (20%)	4 (80%)	0	5

Reanalysing the 2020 paper results into a similar format:

Incineration completion	Studies finding risk or adverse effect	Studies finding no risk or adverse effect	Studies that were inconclusive	Total studies
Before 2000	12 (63%)	7 (37%)		19 [1]
Between 2000-2010	4 (44%)	5 (56%)		9
After 2010	2 (50%)	2 (50%)		4

Regarding health impacts of more recently designed incinerators operating under more strict regulations, it appears that more recent incinerators may be less health harmful. However, caution is needed. To reiterate from the conclusion quoted above:

> "...the power of the result is decreased by the low number of studies and the fact that studies need to be over a long time period to identify such risks. It may be that it is too soon to definitively assess whether new designs and operating procedures are safer."

(d) impacts on human health including on regional town drinking water, rainwater harvesting and soil contamination

The health impacts are addressed in the previous point (c). Effects on regional town drinking water, rainwater harvesting and soil contamination would be difficult to model but units with this expertise would have a better idea of how this can be done. (For instance, the Centre for Safe Air would have this expertise).

Again, the precautionary principle should be applied.

(e) the impact on agriculture locally and across the wider region

PHAA is unable to comment directly on this ToR, but would note that the perception of contamination to regional agriculture may possibly adversely impact export opportunities for local farmers.

Again, the precautionary principle needs to be applied.

(h) the methodology of emission monitoring employed by leading large scale waste-to-energy facilities in Australia and across the world

One of the factors that has arisen in looking at emissions from incinerators is that the monitoring is frequently discontinuous. In order to understand the actual emissions continuous monitoring of stack emissions is essential. This is particularly important during start up and shut down phases when the emissions controls are not fully functional.

A second factor is that the national air quality standards are less strict than other national jurisdictions and this may lead to underestimating actual air quality. The PHAA Outdoor Air Quality Policy Position Statement speaks to our position on air monitoring generally and how in Australia, the base 'acceptable' level of pollution is far too high:[3]

> "10. There is no 'safe' level of air pollution below which adverse health effects have not been observed. This is true even in countries like Australia which, by international standards, have low levels of air pollution.
>
> 18. In Australia, ambient air pollution is regulated by the Ambient Air Quality National Environment Protection Measures (NEPM) which aim to protect human health and well-being. These measures set standards for six air pollutants which jurisdictions report against. The NEPM set the overarching direction for protecting Australians' health.
>
> 19. The NEPM implies there is a 'safe' level of air pollution. Despite an update in 2021, NEPM thresholds for the majority of air pollutants remain higher than the WHO air quality guidelines. The NEPM values for PM2.5 is nearly double those of the WHO air quality guidelines.
>
> 20. Under the NEPM Act, States and Territories are held accountable for meeting the NEPM standards simply through public reporting, though incidents or 'exceedances' are reported to the National Environment Protection Council on an annual basis. These reports can take years to become public, thereby reducing their deterrent value.
>
> 21. The small number and limited coverage of air quality monitoring stations limits their capacity to detect changes in air quality at a local level, particularly for regional communities."

Emissions monitoring should be real time and continuous, and the Australian Air Quality Standards should be strengthened.

(i) alternative solutions to reduce and manage residual waste produced by Greater Sydney

Another study looking at the social, economic and environmental aspects of WtE in Australia concluded[4]:

The results are equivocal regarding the suitability of WtE-I, and are contingent on variables such as subsidies, land availability, specifics of WtE-I plant technology, MSW composition, the policy environment, availability of alternatives (e.g. reducing and recycling), and the extent to which the electricity grid is renewable. From the literature we find that the negative impacts of WtE-I outweigh the benefits.

> "We found that WtE-I suffers from negative public perception. WtE-I plants are often built in densely populated, poorer areas, at the expense of environmental and social justice for residents, who are generally opposed to WtE-I projects. This grassroots opposition to WtE-I is reflected in how locals

[3] Outdoor Air Quality Policy Position Statement [Internet]. Canberra: Public Health Association of Australia; 2016, [updated 2025]. Available from: URL https://www.phaa.net.au/common/Uploaded%20files/SIG%20documents/Ecology%20and%20Environment%20SIG/PPS%202025/0513%20-%20EE%20-%20Outdoor%20Air%20Quality%20-%202025.pdf

[4] Tait, P.W.; Salmona, J.; Sandhu, M.; Guscott, T.; King, J.; Williamson, V. Economic, Environmental, and Sociopolitical Aspects of Waste Incineration: A Scoping Review. Sustainability **2025**, 17, 5528. https://doi.org/10.3390/su17125528

> frame WtE-I as a non-renewable, noxious technology, while policymakers often view it as a renewable technology that can help meet their GHG targets. Although financial compensation and collaborative and transparent planning can ameliorate public opposition to some extent, social injustices persist in the form of increased exposure to toxins detrimental to human and ecological health in areas near WtE-I plant.[34] For policymakers, there has been ongoing tension between the economic and GHG benefits of WtE-I and the grassroots opposition against WtE-I, with some constituencies encountering a policy paradox in which pro-WtE-I policies are in direct contravention of the stated values of that constituency."

Environmentally, WtE-I appears generally superior to landfill. Nevertheless, there are substantial concerns regarding toxic chemicals in flue gas, heavy metals in bottom ash, and air quality around plants. The profile of environmental externalities is dependent on the regulations to which a WtE-I facility is built, retrofitting, and MSW fractions that are incinerated (e.g. plastics are the most calorific and polluting fraction). Further we found no studies directly comparing the emission profile of WtE-I to other renewable technologies.

From an economic perspective, WtE-I has benefits under certain conditions and assumptions. These include economic superiority compared with landfill, as well as GHG emissions savings under the assumption of a fossil-fuel driven electricity grid. Compared with renewables, WtE-I is either inferior or equal in terms of LCOE, reflecting differences in how LCOE is calculated across studies. The high capital, operational and maintenance costs of WtE-I present a high barrier to entry. In a policy environment favouring transition to a reduction and recycling-driven circular economy, the resultant diversion of MSW away from WtE-I means that recouping initial investments in the lifetime of a WtE-I plant may be unrealistic. Furthermore, the concomitant adoption of renewables is likely to reduce the economic and GHG benefits of WtE-I, so that continuing WtE-I will no longer be economically or environmentally justifiable.

Funds that are currently allocated towards the development of a new WtE-I facilities may generate greater net benefit if allocated towards developing a reduction and recycling management approach or renewable energy infrastructure.

In the light of poor economic viability, unclear environmental outcomes, public health concerns, and social justice issues, we recommend that WtE-I not be relied upon as a significant and enduring component of the energy supply and waste management in the Australian context. We predict ever diminishing economic and environmental benefits of WtE-I as the electricity grid becomes more renewable and as recycling becomes the predominant waste management strategy.[63,71] Finally, we recommend more progressive waste management strategies be adopted to facilitate the move towards renewable energy and waste minimisation, which have proven to be effective in other settings.[53]

Australia has a National Waste Policy and Action Plan with the aim of promoting a circular economy by implementing waste management in line with these principles[5]:

1. Avoid waste:
    - Prioritise waste avoidance, encourage efficient use, reuse and repair
    - Design products so waste is minimised, they are made to last and we can more easily recover materials.
2. Improve resource recovery:
    - Improve material collection systems and processes for recycling

[5] Department of Climate Change Energy the Environment and Water. (2024). *National Waste Policy Action Plan*. https://www.dcceew.gov.au/sites/default/files/documents/national-waste-policy-action-plan-2024.pdf

- Improve the quality of recycled material we produce.

3. Increase use of recycled material and build demand and markets for recycled products.

4. Better manage material flows to benefit human health, the environment and the economy.

5. Improve information to support innovation, guide investment and enable informed consumer decisions.

The Blue Environment, 2023, National Waste Report 2022 Final (1.2) states that:

> "While the role of EfW in waste management is acknowledged, some stakeholders express uncertainty about the long-term future of EfW within a circular economy and caution that facilities should not be reliant on plastic feedstocks or undermine recycling initiatives."

The point here is that the economic arguments for WtE are not strong, and energy is better directed to Australia's current waste management circular economy policies with a focus on primary prevention, that is waste reduction, backed up by redesign, repurpose, reuse, repair, recover and as last resort recycle processes. Building incinerators that require waste for feedstock seems illogical.

Conclusion

PHAA appreciates the opportunity to make this submission and we are keen to ensure action in line with this submission. We are particularly keen that the following points are highlighted:

1. The New South Wales government proceeds very cautiously with rolling out WtE facilities.
2. Community concerns about health, social and environmental effects are important both because of demonstrated effects and the mental health overlay concern about these facilities can cause. Local residents' concerns need to be taken seriously.
3. Implementation of the National Waste Policy and Action Plan needs to be prioritised to reduce the volume of waste needing disposal.
4. If waste incinerators are rolled out, strict regulation and monitoring of the incinerators, the regional environment and their emissions is required, and needs to be incorporated in licencing agreements.
5. If waste incinerators are rolled out, local communities should have real time access to the emissions monitoring reports of the facilitities.

Please do not hesitate to contact us should you require additional information or have any queries in relation to this submission.

Dr Peter Tait
Fellow
Public Health Association of Australia

A/Professor Kate McBride
President, NSW Branch
Public Health Association Australia

Mr Malcolm Baalman
Policy and Advocacy Manager
Public Health Association Australia

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