INQUIRY INTO ENERGY FROM WASTE FACILITIES

HEARING: 15 December 2025

Mr Tony Chappel, Chief Executive Officer and Mr Stephen Beaman, Executive Director Operations, NSW Environment Protection Authority

NSW EPA REPSONES TO SUPPLEMENTARY QUESTIONS

1) EPA stated that EfW facilities will be rigorously regulated. What evidence from operational EfW facilities has EPA relied upon to assess sustained compliance performance over time, including enforcement history, licence breaches or exceedances beyond the commissioning phase?

The EPA requires that energy recovery facilities must use technologies that are proven, well understood and capable of handling the expected variability and type of waste feedstock. This must be demonstrated through reference to fully operational plants using the same technologies and treating like waste streams in other similar jurisdictions. Proponents are required to demonstrate anticipated performance to the satisfaction of the EPA as part of the planning assessment process for a proposed facility.

2) Previous NSW Government policy and evidence described EfW standards as more stringent than international best practice, whereas current EPA evidence refers to standards being aligned with international practice. What rationale informed the decision to move away from a more stringent regulatory approach for NSW?

In December 2024, the NSW Minister for Environment Penny Sharpe wrote to the Chief Scientist and Engineer on energy from waste to ask for advice on international best practice standards and controls for energy from waste facilities.

In April 2025, the Chief Scientist and Engineer wrote to NSW Minister for Environment Penny Sharpe confirming that emission limits in NSW are among the most stringent when compared to other jurisdictions. The Chief Scientist and Engineer suggested the regulation could be amended following consultation, to add some flexibility to the current settings – with technical and operational practicability and costs to industry in mind.

Further information on the assessment of emissions is provided in response to Question 8.

3) EPA referred to compliance with licence limits. What pollutants will be subject to continuous emissions monitoring under NSW EfW licences, and how does this compare with EU BAT requirements for metals, mercury and dioxins?

In NSW, an Energy from Waste facility would be required as a minimum to continuously monitor air pollutants as listed in the NSW Energy from Waste Policy Statement.

The Pollutants include:

- oxides of nitrogen (NOX)
- CO (Carbon Monoxide)
- solid particles (Total)
- total organic compounds
- hydrogen chloride
- hydrogen fluoride (HF)
- sulphur dioxide (SO2)
- and ammonia.

Exemptions may be granted for continuous ammonia and HF monitoring.

The Kwinana facility continuously measures these pollutants with the exception of ammonia and HF.

In Europe, Best Available Techniques (BAT) is to also continuously measure air emissions of mercury unless the waste can be proven to contain a low and stable level of mercury content.

In NSW an Energy from Waste facility would also be required as a minimum to periodically measure air pollutants as listed in the NSW Energy from Waste Policy Statement.

Those pollutants are:

- metals (Type 1 and Type 2 substances)
- mercury
- cadmium and thallium
- polycyclic aromatic hydrocarbons
- dioxins and furans

Frequency is every 3 months for the first 12 months of operations and two measurements per year thereafter.

In Europe, BAT is to additionally measure nitrous oxide (N2O) in some situations and frequency for all pollutants is two measurements per year.

The EPA may set more stringent monitoring requirements in conditions of the environment protection licence. This could include, but not limited to, continuous monitoring of additional pollutants if warranted where feasible monitoring techniques become available, Continuous monitoring of mercury is a relatively new technology. Continuous monitoring of dioxin and furan emissions is not technically possible. However, the EPA will require they be monitored quarterly in the first year of operation, further, as a proxy, the EPA will require the continuous monitoring of dioxin and furan precursors such as solid particles and hydrogen chloride and combustion conditions (combustion chamber temperature, carbon monoxide).

4) EPA evidence stated that EfW emissions would not result in measurable changes to background levels of pollutants. What baseline environmental data is EPA relying on to support that conclusion for sites such as Parkes and Tarago?

The EPA does not believe that it has stated this in its evidence. Our response to Question 8 details how any proposed facilities will be assessed and regulated to ensure the community and the environment will be protected

5) EPA evidence stated that PFAS is destroyed through EfW. What empirical evidence has EPA relied upon to distinguish chemical destruction from capture or redistribution into ash or other residues?

Whilst PFAS in emissions from EfW facilities is an emerging area of study, the EPA is aware that studies to date indicate that a significant proportion of long chain PFAS are destroyed during incineration.

The EPA is liaising with industry to obtain a better understanding of the nature of bottom ash and pollution control residues, including PFAS. As noted in the Waste and Circular Infrastructure plan we are also establishing an intergovernmental working group to consider these materials and appropriate pathways for their management.

6) What assessment has EPA undertaken of the long-term environmental pathways associated with bottom ash and air pollution control residues, including potential soil and water exposure if reused or disposed of?

The EPA is liaising with industry to obtain a better understanding of the nature of bottom ash and pollution control residues. As noted in the Waste and Circular Infrastructure plan we are also establishing an intergovernmental working group to consider these materials and appropriate pathways for their management.

7) EPA evidence indicated that EfW facilities could operate safely outside the current precincts. What evidence underpins the continued use and proposed expansion of a precinct-based framework rather than site-specific, criteria-based assessment?

Energy from waste facilities are safe enough to be located within large population centres, and many are around the world, including in Paris and Tokyo. The precinct-based approach to the location of large mixed-waste energy from waste facilities is a matter of Government policy. No matter where an energy from waste facility is in NSW, the standards for air emissions and ground-level concentrations apply. Environmental and human health risk assessments also need to be completed as part of the development and need to demonstrate that the community and environment will be protected.

8) What peer-reviewed health or epidemiological evidence has EPA considered in assessing whether compliance with emissions limits equates to negligible long-term health risk for nearby communities?

Proponents of Energy from Waste Facilities are required to undertake detailed technical Air Quality Impact Assessments as part of the development approval process. These assessments must be undertaken in accordance with the EPA's *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (Approved Methods for Modelling).

An Air Quality Impact Assessment is a technical study that involves modelling to predict the impacts the air emissions from an EFW plant have on the surrounding community.

The modelling takes into account:

- Terrain data and the effects terrain has on how the pollutants disperse as they travel from the source to the receiver.
- Meteorological data, which impacts where the pollutant may travel and how the pollutant disperses in the environment.
- Emissions data, which is typically collected from an existing Energy from Waste Plant that uses similar technology.
- Existing air quality for the purposes of assessing cumulative impacts.

The modelling predicts air pollutant concentrations at places where people live and/or reside. These concentrations are then compared against health protective assessment criteria. Where compliance with these criteria is found, then adverse health impacts would not be expected.

Where the model predictions are found to be above the health protective assessment criteria, proponents are required to implement additional mitigation measures and revise the modelling accounting for these additional mitigation measures. Compliance with the health protective assessment criteria must be achieved.

Air Quality Impact Assessments for Energy from Waste Facilities typically prepare a number of assessment scenarios. These scenarios can include:

- An expected case scenarios based on emissions data obtained from an existing operational EfW Plant. This scenario provides a prediction on the expected spread of emissions and expected impacts of the emissions.
- A regulatory worst-case scenario which assumes emissions at the proposed regulatory limit for a complete year of meteorological conditions. This scenario provides an indication of the maximum possible spread of emissions and maximum possible impact of the emissions.

It Is EPA Policy to set emission limits within an Environment Protection Licence that protect the health and amenity of the surrounding community. The EPA can use the regulatory worst-case scenario to inform the particular limits that could be set within an EPL to ensure the health and amenity of the surrounding community is protected.
The EPA can also set lower air emission limits than those prescribed by Regulation. This can include setting stricter limits to address any project specific risks for any industry.

9) **Has EPA assessed cumulative environmental or health exposure for communities already subject to industrial, transport or agricultural emissions in proposed EfW precincts, and if so, how?**
No. These assessments would be completed by proponents as part of the development assessment process.

10) **What analysis has EPA undertaken of projected residual waste volumes suitable for EfW over the next 10–20 years, including assumptions about recycling performance and waste avoidance?**
To inform development of the Waste and Circular Infrastructure Plan, NSW EPA conducted a residual waste infrastructure needs analysis. The analysis assessed existing residual waste infrastructure capacity against projected residual waste volumes out to 2040. Assumptions about recycling performance and waste avoidance were built into these projections.

11) **What assessment has EPA undertaken of whether long-lived EfW capacity could constrain future waste reduction or material recovery outcomes under the Waste and Sustainable Materials Strategy?**
The Waste and Sustainable Materials strategy acknowledges that EfW is a legitimate and necessary residual waste management option, especially where it can assist in lowering the need for landfill.
It also notes that the Strategy supports energy recovery where it makes sense to do so and where it is used to manage residual waste, not as an alternative to recycling.

12) **In light of unresolved assessments and community concerns at existing or proposed EfW sites, what evidence supports expanding the EfW framework at this stage?**
The rationale for changes to the EfW framework are outlined in the Waste and Circular Infrastructure Plan.

13) **What evidence gaps or uncertainties does EPA acknowledge in assessing long-term environmental and health impacts of EfW facilities under NSW conditions?**
The assessments completed as part of the development approval process can address any uncertainties and evidence gaps. EPA can also recommend consent conditions and set EPL conditions to gather additional information and address any uncertainties, including investigation of any emerging contaminants.

14) **Economic benefits were cited in support of regional EfW facilities. What proportion of those benefits accrue to host communities, as distinct from proponents or metropolitan waste generators, and how has that been assessed?**
The Energy from Waste (EfW) precincts are based on strategic planning principles:
- close to existing or planned infrastructure
- connected to existing or planned road or rail infrastructure
- support existing waste, net zero and regional growth strategies.

Proportional economic benefits have not been modelled or assessed in detail.

15) Evidence was given that energy from waste is the only remaining option for managing residual waste. What analysis has the EPA undertaken to determine whether other lawful residual waste management pathways - including landfill or alternative residual treatment options - remain viable under NSW conditions, and what evidence supports the conclusion that those pathways cannot manage residual waste?

In October 2018 the EPA revoked the general and specific Resource Recovery Orders and Resource Recovery Exemptions for the application of Mixed waste organics outputs (MWOO) to land due to risks associated with chemical and physical contaminants. MWOO had been the primary output of the alternative waste treatment (AWT) industry in NSW up to this point. NSW EPA continues to assess applications for new and alternative uses on a case by case basis for AWT.

Outside of this, without investment in and construction of additional landfill capacity in NSW, energy from waste technology is the only other proven and viable technology, providing that it meets all regulatory, planning and environmental requirements.

The Waste and Circular Infrastructure Plan outlines the approach to addressing NSW's landfill constraints.

16) What contingency planning has the EPA undertaken if approved EfW facilities do not proceed, operate below capacity, or are temporarily unavailable, given landfill constraints and long-distance transport reliance?

The Waste and Circular Infrastructure Plan outlines the approach to addressing NSW's landfill constraints.

17) What minimum evidence threshold does the EPA require before supporting expansion of the EfW framework, and has that threshold been met for the proposed regional sites?

The precinct-based approach to the location of large mixed-waste energy from waste facilities is a matter of Government policy. No matter where an energy from waste facility is in NSW, the standards for air emissions and ground-level concentrations apply. Environmental and human health risk assessments also need to be completed as part of the development and need to demonstrate that the community and environment will be protected.

18) Where cumulative impacts on regional communities may arise over time from multiple waste, transport or industrial activities, which agency bears responsibility for assessment, mitigation and ongoing oversight?

The NSW Department of Planning, Housing and Infrastructure is responsible for assessing cumulative impacts of proposed development.

19) What safeguards exist to prevent long-term EfW contracts and capacity from constraining future waste reduction, reuse or recycling outcomes under NSW policy settings?

NSW EPA is not involved in the contracting arrangements for residual waste management in NSW.

The NSW EPA Energy from Waste Policy statement sets out upstream resource recovery requirements for EfW facilities operating in NSW. These requirements will be captured during the planning assessment process for any proposal and will be monitored and enforced during facility operation.

20) Most human exposure to dioxins occurs through food. Has the EPA modelled contamination of soil, water and locally produced eggs or meat from energy from waste facilities? a. If so, is this modelling publicly released? If not, why not?

Modelling of pollutant release and distribution is undertaken as part of the development assessment process. These studies are made public on the DPHI planning portal.

21) What long term modelling will be completed for the health and safety of staff working at future energy from waste facilities?

This question should be directed to SafeWork NSW.

22) Is the EPA able to guarantee that there will be no contamination to agriculture, environment or human health as a result of future energy from waste facilities?

Please see the answer to Question 8. In addition to this, the EPA would licence and regulate any future EfW facility to ensure ongoing compliance with established emissions requirements for protection of the environment and human health.

23) In the hearing on 15 December 2025, witnesses from Veolia stated that at one site where breaches of regulation occurred, "there was some sampling of a local creek which had some chemicals in it after many years of a mining activity and farming activities which have contributed to the quality of the waterway". How will the EPA hold energy-from-waste facility proponents accountable for any future contamination of the local agricultural environment?

a. How does the EPA identify the source of any identified environmental contamination in proximity to energy from waste facilities?

The EPA has a range of tools available to it under the POEO Act to investigate and respond to potential pollution incidents. The tools and approaches used will depend on the particular circumstances of any incident.

24) In the hearing on 15 December 2025, the witness representing Environmental Sciences Pty Ltd stated that "there are dioxins in all the soil" and that "dioxins are present naturally in the environment already… there is no evidence that the energy-from-waste facility [facilities in Spain] changed that from being the typical background ambient". Will the EPA collect baseline soil samples from all four precincts where facilities are proposed to be located to measure any future contamination against? a. Has this baseline testing been conducted?

The EPA will require emissions testing, and will consider the need for baseline ambient testing as part of its input to the planning assessment process for individual facilities.

25) Are you able to point the Committee to any long-term, independently conducted studies confirming there is no increased risk of cancer, reproductive harm or developmental impacts for communities living near energy from waste facilities? b. Some pollutants accumulate over a lifetime and disproportionately affect children. What evidence demonstrates that your assessments adequately account for these long-term, low-dose exposures?

The EPA is aware of several systematic reviews (eg Tait et al. 2020; Bottini et al. 2025; Negri et al. 2020).

The findings from these studies indicate limited available evidence of an adverse impact from facilities operating to contemporary standards, however they also note limitations to these studies such as shorter operational timespans

The development assessment process in NSW requires the preparation of a health risk assessment which accounts for life-time low dose exposures.

26) What technology exists to continuously monitor emission of air pollutants from proposed energy-from-waste facilities?

CEMS is the industry standard for real-time monitoring of pollutants in flue gases. It uses advanced analysers and sensors to measure concentrations of:

- NO_x (Nitrogen Oxides)
- SO_2 (Sulfur Dioxide)
- CO (Carbon Monoxide)
- CO_2 (Carbon Dioxide)

- Particulate Matter
- Heavy metals (e.g., Hg)
- Acid gases (HCl, HF)

Optical or infrared spectroscopy, electrochemical sensors, and gas sampling cells continuously track emissions. Data is logged and transmitted to regulatory authorities for compliance.

27) Will future monitoring of emissions from proposed energy-from-waste facilities include unannounced sampling and unrestricted publication?

The EPA uses a range of approaches to check and ensure compliance, including unannounced inspections and sampling.

We will require publication of continuous monitoring in near real time. Other monitoring data is required to be published by operators within 14 days.

28) In the event of an unanticipated air pollution incident, what is the protocol for community notification and disclosure?

All holders of environment protection licences, or licensees, are required to prepare a Pollution Incident Response Management Plan (PIRMP) in accordance with section 153A of the Protection of the Environment Operations Act 1997 (POEO Act).

A PIRMP is a document that outlines what procedures are in place to minimise the risk of a pollution incident on a premises.

This includes having clear and effective notification, action and communication procedures to ensure the incident is dealt with safely, and all relevant people and authorities are notified, and kept informed throughout the incident.

29) Does the NSW EPA have any requirement for energy from waste facilities to carry out ambient air quality monitoring or health monitoring as a condition of their licence to operate?

a. How does the EPA respond to the Public Health Association of Australia's submission that 'waste incinerators are associated with health harms', that a 'precautionary approach is warranted' and that '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.'

b. Will the EPA adopt the Public Health Association of Australia's recommendation 5 that 'if waste incinerators are rolled out, local communities should have real time access to the emissions monitoring reports of the facilities'?

Relates to response at question 3 and 24. Real time monitoring for ambient air quality would occur, with the data available to be community.

30) How was Dr Ali Abbas selected to review the Chief Scientists Report into Energy from Waste?

This question should be directed to the Office of the Chief Scientist & Engineer.

31) What consideration has been given to the environmental impact of transporting waste hundreds of kilometres away from its source?

Greater Sydney already transports around half of its residual waste hundreds of kilometres by rail to Veolia's Woodlawn facility.

Without action, even greater amounts of residual waste will need to be transported, most likely via road to alternative disposal sites in regional NSW or interstate.

32) What party would be liable in the event that agricultural markets reject products due to contamination by a waste-to-energy facility?

The EPA will not speculate on hypothetical questions on liability.

33) Did the EPA consider alternative solutions to the waste crisis outside of energy from waste facilities in drafting and publishing the NSW Waste and Circular Infrastructure Plan? e. Why has energy from waste been prioritised above other options such as stronger product stewardship?

a. What consideration did the EPA give to the 2018 Parliamentary inquiry into 'Energy from waste' technology recommendations, none of which prioritised energy from waste as a primary solution to waste management?

Energy from Waste has not been prioritised above other solutions. Product stewardship will be integral to improving resource recovery in NSW and the NSW Government is already moving, ahead of the Commonwealth, on product stewardship in NSW. This includes, the ongoing success of the container deposit scheme, the recently passed Product Lifecycle Responsibility Act 2025 establishing a legislative product stewardship framework in NSW and the ongoing work to establish product stewardship approaches for hazardous material in the recycling streams such as batteries.

The EPA considered a range of solutions to addressing the waste crisis in NSW and engaged widely with stakeholders form local government and the waste industry to inform these considerations.

The 2018 Inquiry was conducted during the sitting of the 56th Parliament of NSW and responded to by the sitting NSW Government at that time.

34) Independent analyses find that waste-to-energy has a higher emissions intensity than gas generation. How does the EPA reconcile this with NSW's legislated climate commitments?

Energy from waste in NSW is not solely intended as a power generation solution but as a last-resort option for managing residual waste that cannot be avoided, reused or recycled. While some analyses compare its emissions intensity to gas generation, this does not reflect its role in managing waste streams that would otherwise go to landfill and generate methane. Any energy from waste facility is regulated through NSW and Commonwealth climate frameworks. Energy from Waste facilities that emit more than 25,000 tonnes of greenhouse gas emissions per year will be required to develop a climate change mitigation and adaptation plan and apply the Large Emitters Guide when progressing proposals through the NSW planning process.

35) Financial models have relied on consistent waste volumes. How does this align with circular-economy goals that require substantial reductions in residual waste?

The NSW Government acknowledges that EfW may be a legitimate and necessary residual waste management option, especially where it can assist in lowering the need for landfill.

It also notes that the Waste and Sustainable Materials Strategy supports energy recovery where it makes sense to do so and where it is used to manage residual waste, not as an alternative to recycling.

Financial modelling is the purview of proponents.

36) Several countries in Europe are moving away from incineration, with calls for a moratorium on new waste to energy facilities. Has the EPA considered why certain European countries are now phasing out the use of energy from waste facilities?

- **a. How does NSW justify adopting a trajectory that other jurisdictions are abandoning?**
- **b. What learning has the EPA considered in its guidance around energy from waste facilities based on these findings?**

The residual waste management policies and approaches of other countries are typically based on a complex range of factors such as legacy waste management approaches, land availability for landfill, maturity and success of resource recovery frameworks, cost, and politics.

The EPA notes that energy from waste remains a significant and growing part of the residual waste management mix for many countries including in Europe.

37) What role would the EPA play in ensuring that residual waste levels are reduced at a local level while waste management companies and waste to energy facilities are supplied with a sufficient quantity of waste to remain viable?

- **a. Who would be responsible for supplying additional waste to waste to energy facilities, if local councils successfully reduced their residual waste volumes below a threshold considered viable by facility operators?**

The NSW EPA Energy from Waste Policy statement sets out upstream resource recovery requirements for EfW facilities operating in NSW. These requirements will be captured during the planning assessment process for any proposal and will be monitored and enforced during facility operation.

The NSW Waste and Sustainable Materials Strategy supports energy recovery where it makes sense to do so and where it is used to manage residual waste, not as an alternative to recycling.

NSW EPA is not involved in the contracting arrangements for residual waste management in NSW.

38) Were any health, environmental or agricultural studies conducted on the four designated precincts: West Lithgow Precinct, Parkes Special Activation Precinct, Southern Goulburn Mulwaree Precinct and Tomago Precinct?

- **a. If so, what did these studies show?**
- **b. If so, are they publicly available? i. If not, why not?**

Detailed health and environmental studies (including agriculture) will be required as part of the planning assessment for any proposed facility in these areas. These are the same requirements that apply to any proposed large industrial development either within a precinct or anywhere else in NSW.

39) Was any consultation with Traditional Owners conducted prior to the selection of these designated precincts? I. If so, what did the consultation involve?

- **a. If so, what was the outcome of this consultation?**
- **b. If not, why was no consultation conducted?**

Regional Growth NSW Development Corporation lead engagement with the local Aboriginal peoples on the development of special activation precincts.

This included for example directly engaging with the Wiradjuri peoples, the traditional owners of the Parkes area on the *Aboriginal Cultural Heritage and Historic Heritage Assessment Report*, along with the *Parkes SAP Environmental Heritage and Sustainability Summary Report* and the *Aboriginal Due Diligence Assessment: Parkes Special Activation Precinct Enabling Works* and the *Cultural Heritage Management Plan*.

We recognise the importance of and welcome all engagement and feedback.

A development application (DA) has not been lodged with the Department of Planning for Parkes Energy Recovery. Any DA will be subject to a rigorous assessment process, including environmental impact and risk assessments, public exhibition and community consultation.

Energy from Waste Framework

- In 2025, the **EPA consulted publicly** on a review of the Energy from Waste Framework.
  - As part of that process, we met with councils and councillors.
  - We also wrote to stakeholders including industry, peak environmental groups and community groups, and invited anyone who had contacted the EPA about EfW in the past two years to provide feedback.
  - The EPA received 822 survey responses and 323 written submissions.
  - The EPA reached out the Peak Hill/Parkes Local Aboriginal Land Council and offered to meet with them on the Energy from Waste Framework.
  - The results of the NSW energy from waste framework review are contained in the Plan, which is available at NSW Waste and Circular Infrastructure Plan.

Engagement on Energy from Waste Policy Statement in 2021 and the Energy from Waste Regulation in 2022

- When we consulted on the Energy from Waste Policy Statement and the Energy from Waste Regulation in 2021 and 2022, we promoted the consultation through media, social media and directly with local government, industry and environmental groups and community within precinct areas.
- We received submissions from individuals, community groups, councils, environmental groups and industry, including feedback from within the precinct areas.
- Summaries of the consultation, including how we consulted, details on the numbers of submissions and sectors we received them from and outcomes are publicly available on our Have Your Say consultation website page.

40) Why was Parkes selected as a designated precinct? o. Who was responsible for making this decision?

a. What alternative waste management solutions have been investigated, or invested in since the Parkes energy from waste facility was initially proposed for Parkes Special Activation Precinct?

The precinct-based approach to the location of large mixed-waste energy from waste facilities is a matter of Government policy. The Energy from Waste (EfW) precincts are based on strategic planning principles:

- close to existing or planned infrastructure
- connected to existing or planned road or rail infrastructure
- support existing waste, net zero and regional growth strategies.
- The Waste and Circular Infrastructure Plan outlines the range of solutions that are being applied to manage Sydney's residual waste.

41) Are regional councils compensated for hosting metropolitan waste infrastructure?

There is no compensation provided to regional councils for hosting waste infrastructure.