Submission No 123

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

Organisation: Waste Circology

Date Received: 16 October 2025

Submission No 86

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

Organisation: Waste Circology Pty Ltd

Date: 16th of Oct 2025

Contact: Joseph Taouk

Email:

Mob:

Website: https://wastecircology.com

---

1. Introduction

Waste Circology welcomes the opportunity to provide a submission to the NSW Legislative Council Select Committee on Proposed Energy from Waste Facilities.

As an Australian company specialising in low-emission waste-to-carbon solutions, we submit that the proposed Parkes Energy Park and Woodlawn Advanced Energy Recovery Centre do not reflect best-practice or "state-of-the-art" approaches to sustainable waste management.

Our patented Organic Carbonisation System (OCS) demonstrates a safer, circular-economy alternative that retains carbon rather than combusting it, converting diverse waste streams—including soft plastics, tyres, agricultural residues, and contaminated organics—into stable biochar and carbon-rich co-products.

We urge the Committee to differentiate carbonisation (anaerobic conversion) from incineration (oxidative combustion) when assessing the environmental, health and agricultural implications of proposed facilities.

2. Term of Reference (a): Comparison to Leading Technologies

The Parkes and Tarago proposals rely on thermal oxidation (combustion) under the "energy recovery" model. While branded as advanced, these are not deployed anywhere on Australia's eastern seaboard and fail to meet the performance standards of next-generation carbon-retention systems operating in Europe and Asia.

By contrast, Waste Circology's OCS technology:

- Operates in an oxygen-limited environment, preventing combustion.
- Converts up to 45%-65% of feedstock carbon into solid biochar.
- Produces negligible visible emissions and minimal CO_2 release.
- Generates useful process gases for internal heat recovery.

These characteristics align with "state-of-the-art" low-emission carbonisation facilities recognised internationally for high energy efficiency and carbon retention—not with incinerators that destroy material value.

---

3. Term of Reference (b–d): Emissions, Monitoring and Human Health

EfW incineration inherently produces CO_2, NOx, SOx, dioxins, furans, and ultrafine particulates that cannot be fully captured by filters. These emissions accumulate in soils, water systems and the food chain—posing long-term human and livestock health risks, as evidenced in submissions from regional farming families and councils.

By contrast, the OCS system:

● Is combustion-free and self-contained.

● Operates under negative pressure, with no stack plume.

● Produces condensable vapours that are recirculated or condensed, not vented.

● Enables continuous emission monitoring (CEMS) for CO, CO_2, and VOCs, with results far below regulated thresholds.

OCS eliminates the release of toxic fly ash and heavy metals into the air and instead stabilises these elements in the solid carbon matrix for safe reuse or immobilisation—thereby protecting rainwater, soil and human health, particularly in rural catchments reliant on rainwater harvesting.

---

4. Term of Reference (e): Agricultural Impacts

Parkes and Tarago sit within highly productive agricultural zones. As highlighted in other submissions, even perceived contamination from incinerator emissions could devastate market confidence in regional produce.

Conversely, OCS-derived biochar directly enhances agricultural resilience:

● Improves soil structure, nutrient retention and microbial activity.

● Reduces fertiliser dependency and nitrate leaching.

● Provides a verifiable carbon sequestration pathway eligible under emerging carbon credit methods.

Integrating OCS technology into regional waste strategies transforms the waste burden into a carbon-positive agricultural asset, rather than a pollution risk.

---

5. Term of Reference (f–g): Regional and Environmental Context

The Parkes Special Activation Precinct was conceived as a clean, innovation-driven logistics and manufacturing hub. Installing a large combustion-based facility within this precinct would compromise its environmental credentials and deter future green investment.

Similarly, the Tarago region already hosts multiple waste and energy operations, with communities expressing cumulative-impact fatigue. Deploying low-emission, modular OCS units instead of a single central incinerator would reduce heavy transport, distribute economic benefits locally, and uphold regional equity.

---

6. Term of Reference (h): Monitoring and Transparency

OCS systems integrate digital performance and emissions monitoring, providing transparent data dashboards for regulatory agencies and community oversight. This approach could serve as a model for next-generation waste accountability frameworks, contrasting sharply with legacy EfW facilities reliant on intermittent stack testing.

---

7. Term of Reference (i): Alternative Solutions

Waste Circology supports a hierarchy of circular solutions over incineration:

1. Waste avoidance and reduction through product stewardship.

2. Material recovery and recycling for plastics, metals and organics.

3. Low-emission carbonisation for residual organics and contaminated fractions.

4. Carbon product valorisation (biochar, activated carbon, carbon-powered minerals).

OCS closes the loop by converting problematic residues into stable, reusable carbon—meeting the NSW Waste and Sustainable Materials Strategy 2041 and Circular Economy Roadmap far more effectively than energy-from-waste incineration.

---

8. Term of Reference (j): Related Matters

OCS technology aligns with:

● NSW Net Zero Plan (2020–2030) — by avoiding combustion emissions.

● ARENA Powering the Regions – Industrial Transformation Stream — enabling low-carbon industrial symbiosis.

● Carbon Farming Initiative (Biochar Method, under development) — providing quantifiable carbon sequestration credits.

Waste Circology stands ready to collaborate with government and industry to pilot carbon-neutral waste transformation hubs in regional NSW.

---

9. Conclusion and Recommendations

Waste Circology respectfully submits that:

1. Combustion-based EfW incinerators at Parkes and Tarago present unacceptable environmental, health and agricultural risks.

2. Low-emission carbonisation should be formally recognised as a distinct, sustainable alternative within NSW waste strategy.

3. The Committee should recommend a moratorium on large-scale incineration pending full comparative analysis with carbonisation, pyrolysis, and gasification systems.

4. The NSW Government should support demonstration of OCS technology within regional activation precincts to validate its environmental and economic benefits.

By prioritising carbon retention over destruction, New South Wales can lead Australia in genuine circular-carbon innovation—turning waste liabilities into valuable, permanent carbon assets.

Bibliography

1. European Commission JRC (2019). Best Available Techniques (BAT) Reference Document for Waste Incineration (WI BREF).

https://eippcb.jrc.ec.europa.eu/reference/waste-incineration

2. UNEP IETC (2019). Waste-to-Energy: Considerations for Informed Decision-Making.

https://wedocs.unep.org/20.500.11822/28413

3. European Biochar Foundation (latest ed.). European Biochar Certificate (EBC) – Guidelines.

https://www.european-biochar.org/en/ct/2-certification

4. IPCC AR6 WGIII (2022). Mitigation of Climate Change (esp. Ch. 7 & 12).

https://www.ipcc.ch/report/ar6/wg3/

5. Weng, Z.H., Cowie, A.L. Estimates vary but credible evidence points to gigaton-scale climate change mitigation potential of biochar. Commun Earth Environ 6, 259 (2025). https://doi.org/10.1038/s43247-025-02228-x

6. Schmidt, H.-P., Anca-Couce, A., et al. (2021). Pyrolysis and biochar systems for negative emissions and circular economy. GCB Bioenergy, 13(11), 1701–1730.

https://doi.org/10.1111/gcbb.12889

7. Leng, L., Huang, H., et al. (2021). Biochar stability and environmental applications: a review. Bioresource Technology, 338, 125530.

https://doi.org/10.1016/j.biortech.2021.125530

8. Lehmann, J., & Joseph, S. (Eds.). (2015). Biochar for Environmental Management (3rd ed.). Routledge. Publisher page: https://www.routledge.com/Biochar-for-Environmental-Management-Science-Technology-and-Implementation/Lehmann-Joseph/p/book/9781032286150

Submitted by:

Waste Circology Pty Ltd

Joseph Taouk

Managing Director

Email:

Mob:

Website: https://wastecircology.com