Submission No 265

INQUIRY INTO PROPOSED ENERGY FROM WASTE FACILITIES

Organisation: BlueGas Technologies Pty Ltd

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BlueGas Technologies

Submission

Select Committee on Proposed Energy from Waste Facilities

BlueGas Technologies Pty Ltd

31 October, 2025

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To:
The Committee Secretary
NSW Legislative Council
Inquiry into Waste-to-Energy Technologies
Parliament House, Macquarie Street
Sydney NSW 2000

Cover Letter: Submission on Non-Combustion Waste-to-Energy Technologies

Dear Committee Members,
We are pleased to submit this documentation to support the NSW Legislative Council's inquiry into waste-to-energy technologies. Our submission outlines a regulatory interpretation distinguishing our reforming-based platform from incineration, supported by comparative tables, technical commentary, and validated references.

Our technology does not involve combustion and is aligned with circular economy and hydrogen strategies. We have taken care to demonstrate this distinction clearly and consistently.

Importantly, we are not alone in promoting non-combustion solutions. A growing number of international consortia now advocate alternatives such as hydrothermal carbonisation, pyrolysis, gasification, and reforming — citing benefits including lower emissions, decentralised deployment, and improved resource recovery. A summary of these groups is included as an attachment.

We note that the EPA has this week released the first stage of their Waste and Circular Infrastructure Plan. We trust this submission will assist the Committee in evaluating the strategic and regulatory distinctions between combustion-based systems and advanced alternatives to support future directions in your endeavours to deal with residual waste.

We would welcome an opportunity to discuss our technology and how it would augment the energy-from-waste integration, as it has in Europe.

Yours sincerelv.

Lady Jennifer Wentzki
Managing Director
BlueGas Technologies Pty Ltd

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Select Committee Inquiry on Proposed Energy from Waste Facilities

Submission to NSW Parliamentary Inquiry

Committee Reference: PK337 – Waste to Energy Infrastructure Plan
Submitted by: BlueGas Technologies
Date: 31 October 2025

Executive Summary

This submission urges the NSW Government to reconsider the inclusion of large-scale incineration projects in regional areas under the Waste to Energy Infrastructure Plan. It advocates for prioritising low-emission, circular economy-aligned scalable technologies such as those presented by BlueGas Technologies. These systems offer clean, community-compatible solutions that avoid the environmental, social, and regulatory pitfalls associated with mass combustion.

Key Concerns with Incineration in Regional NSW

The proposed incinerator in Parkes, NSW and similar specific nominated regional areas exemplify systemic challenges that undermine regional equity, environmental integrity, and circular economy goals:

1. **Thermal Destruction of Resources**
    - Incineration permanently destroys recoverable materials, locking Councils into inflexible long-term waste contracts that may discourage recycling and innovation.
2. **Toxic Emissions and Food Safety Risks**
    - Combustion technologies emit hazardous substances include dioxins, furans, PFAS and heavy metals. These pose risks to human health and agricultural zones, with potential for soil and groundwater contamination. Added to landfill, such risks may expose governments to future liabilities and sizeable long term negative impacts to communities.
3. **Regulatory Disparity and Environmental Inequality**
    - In 2022, the NSW EPA banned waste incineration near high density residential areas in Sydney but currently permits it in regional locations of Parkes, Goulburn, Lithgow and Richmond Valley. This disparity raises concerns about negative impact on agriculture and community health, regional equity and undermines the precautionary principle and regional trust.

4. **Transport Inefficiencies and Emissions**

    - Large scale Waste Incinerators impose measurable stress on local road infrastructure through two primary mechanisms:
        - Heavy vehicle traffic: Frequent movements of waste delivery trucks, bottom ash removal vehicles, and hazardous residue transport.
        - Reuse of incinerator bottom ash (IBA): Application in road base materials, which may compromise structural integrity and environmental safety.

      These impacts are recognised in both international technical literature and multiple NSW-specific planning documents.

5. **Limited Local Benefit**

    - With only a small number of long-term jobs promised, it appears that regional communities may face reputational and economic losses in agricultural and tourism sectors. Strong, ongoing local opposition reflects extensive concerns about "hosting" waste incinerators for metropolitan centres.

Industry Momentum Toward Non-Combustion Waste-to-Energy Technologies

A growing number of industry-led consortia and alliances across Europe and the United States are actively promoting non-combustion waste-to-energy technologies, reinforcing that our company is not alone in advocating alternatives to incineration. These groups support advanced thermal conversion pathways such as hydrothermal carbonisation, pyrolysis, gasification, and reforming — each offering distinct advantages including lower emissions, improved resource recovery, decentralised deployment, and compatibility with circular economy and hydrogen strategies. This collective movement reflects a broader shift in technology development and policy alignment away from combustion-based systems.

Notably, the European Union's "Fit for 55" legislative package outlines the EU's binding commitment to reduce greenhouse gas emissions by 55% by 2030 and achieve climate neutrality by 2050. It includes reforms to the EY Emissions Trading System, the Renewable Energy Directive and the Hydrogen and Decarbonisation Gas Market Package. The package reinforces this direction by distinguishing low-carbon and renewable technologies from traditional incineration within its emissions and energy frameworks. While the package does not explicitly define waste-to-energy technologies by process type, its emissions-based mechanisms and renewable energy incentives increasingly favour low-carbon, non-combustive pathways over traditional incineration. (Refer attachments for details)

Regulatory Distinction Between Thermal and Non-Thermal Waste-to-Energy Technologies in NSW

Current NSW regulations apply significantly stricter controls to thermal waste-to-energy processes—such as incineration, gasification, and pyrolysis—by limiting their deployment to four designated precincts and restricting broader approval pathways. This reflects longstanding concerns around air quality, community impact, and the risk of low-value combustion-based disposal. In contrast, non-thermal technologies such as anaerobic digestion are permitted statewide under standard planning and environmental pathways, due to their lower emissions and alignment with circular economy principles. However, this binary distinction between thermal and non-thermal processes does not adequately account for **low-emission thermal treatments that do not rely on combustion**, such as reforming and controlled gas-phase conversion. These technologies offer comparable environmental performance to biological methods, with additional benefits in energy recovery, decentralised deployment, and hydrogen integration. As such, regulatory frameworks should evolve to assess waste-to-energy technologies based on emissions intensity and resource recovery outcomes—not solely on process temperature or classification—ensuring that innovative, non-combustive thermal solutions are not inappropriately grouped with incineration.

BlueGas Technologies – A Viable, Scalable Alternative

BlueGas Technologies is a Melbourne-based company specialising in advanced non-combustion energy-from-waste solutions. We present leading, German-designed advanced processes that represent the new generation of waste conversion capabilities. Our platform is built on reforming principles that convert waste into clean energy, hydrogen and other advanced biofuels, including SAF, without incineration, supporting circular economy and decarbonisation goals.

Our systems are designed to meet local needs without the drawbacks of incineration:

- **Non-Incineration Reforming Processes**
  BlueGas Technologies deploys a closed-loop, non-combustion reforming process that converts waste into hydrogen-rich syngas. This aligns with NSW EPA's definition of non-incineration thermal treatment to produce beneficial end-products like biochar, biogas, renewable hydrogen or SAF. This allows co-location in industrial precincts, with local industries, reducing drain on grid and gas energy infrastructure.

- **Compliance with NSW Regulatory Framework**:
  The technology complies with NSW's Energy from Waste Policy Statement and the Waste to Energy Guidelines, while avoiding direct combustion, which maintains emissions well within permissible limits.

- **Scalable Modular Design**:
  Systems are modular and scalable, suitable for deployment across regional and urban settings, supporting circular economy goals and decentralised energy infrastructure.
- **Feedstock Flexibility**:
  Capable of processing diverse non-recyclable waste streams, including plastics, biomass, and municipal solid waste, while maintaining consistent syngas quality.
- **Hydrogen Production for Decarbonisation**:
  Produces hydrogen suitable for industrial use, transport, and grid injection, contributing to NSW's decarbonisation targets and hydrogen strategy.
- **Technology Differentiation**:
  Unlike incineration or pyrolysis, BlueGas reforming avoids combustion, does not produce tar, and operates at lower temperatures with controlled oxygen input. This distinction is supported by legal and technical guidance, including Clayton Utz's legal interpretation of waste to energy and EPA technical guidance.

Recommendations

We respectfully recommend the Committee to:

1. **Pause approval of incineration projects in regional NSW** pending comprehensive review of environmental, health, and equity impacts of this technology type.

2. **Align with key international jurisdictions.** The EU is facing mounting pressure to halt new waste incinerator projects. Several governments are now reconsidering or facing public opposition to proposed facilities, including Germany, Wales and Scotland now formally banning new incineration capacity.

3. **Consider required incorporation of hazardous waste landfills into any future incineration projects.** Large incineration projects deemed essential, that cannot eliminate the emission of dioxins, furans and heavy metals, be required to incorporate a "hazardous waste landfill" into their designs. This also would ensure that they are located well away from any sensitive community or commercial operations and take ownership of grate and fly ash emissions safely on-site.

4. **Prioritise funding and policy support** for circular, non-combustion technologies that align with NSW's decarbonisation and resource recovery goals. (refer Attachment)

5. **Mandate transparent consultation** with relevant regional stakeholders before approving waste-to-energy infrastructure, as suggested in the latest Plan.

6. **Establish a regional innovation fund** to support scalable, community-led alternatives that contribute to NSW renewable energy targets. This could include production of renewable hydrogen and biofuels such as BlueGas systems that could meet GreenPower certification requirements.

Closing Statement

Regional NSW deserves solutions that protect public health, preserve Australian agricultural integrity, and foster local pride. Incineration is not a viable path forward. The Inquiry is encouraged to consider advanced clean solutions for managing the very significant residual waste problem created by Greater Sydney and surrounding regions.

At the same time, care needs to be taken to support Councils and communities with clean, stakeholder-driven solutions that neatly fit within a circular environment.

BlueGas Technologies stands ready to support Councils and communities with clean, circular, and stakeholder-driven alternatives tailored to each individual location and their unique requirements.

We welcome the opportunity to present further evidence or participate in hearings.

Attachments

NSW Senate Enquiry Submission – Waste Incineration

Section 1: Waste Incineration in the EU

Germany, long regarded as a global leader in recycling, is now re-evaluating the role of waste incineration within its national circular economy strategy. While incineration remains legal under EU directives, Germany's 2024 Circular Economy Strategy prioritises waste prevention, reuse, and high-quality recycling—implicitly discouraging further incineration capacity. The European Environment Agency notes that Germany's incineration rate remains high, yet progress in recycling has stalled, particularly for plastics and wood packaging. This has prompted calls to redirect investment toward circular infrastructure rather than thermal treatment.

Across the EU, 156 NGOs have formally petitioned the European Commission and national governments to impose a moratorium on new incinerators, citing overcapacity, climate risks, and health concerns. Notably, regional governments in Wales and Scotland have already banned new incineration projects, aligning with circular economy goals.

These developments suggest that even the most advanced recycling nations are beginning to question the long-term value of incineration. NSW should consider whether new incineration proposals risk locking Australia into outdated, high-emission systems that undermine both climate and resource recovery objectives.

Section 2: Supporting International References

Jurisdiction	Reference	Summary
Germany	Federal Environment Ministry – NCES	Prioritises waste prevention and reuse; incineration not promoted.
Germany	Germany Country Profile – European Environment Agency This page hosts the country profile detailing Germany's energy support measures, including feed-in tariffs, fiscal instruments, and renewable energy incentives.	Incineration rate remains high; recycling progress stalled.
EU-wide	Zero Waste Europe – Joint Letter PDF	156 NGOs call for EU-wide moratorium on new incinerators.

Wales	UKWIN Open Letter to Defra	Moratorium introduced; recycling rates exceed 70% in some councils.
Scotland	STV News – Scottish Parliament Announcement	Ban on new incinerators following independent review.
EU Wide	Fit for 55 - Consilium	The European climate law makes reaching the EU's climate goal of reducing EU emissions by at least 55% by 2030 a legal obligation.

Section 3: EU assessment of the Concord Blue Reformer as Thermal Recycling

Our offering, the Concord Blue Reformer (CBR©) represents an example of the superior alternatives now available. It is a non-incineration thermal recycling technology that has been independently validated and deployed internationally. Unlike conventional incineration or gasification, the CBR operates via **steam thermolysis and staged reforming** in a **closed-loop, oxygen-free environment**, converting waste into ultra-clean syngas without combustion.

This process has been assessed in multiple jurisdictions as a form of **advanced thermal recycling**, meeting stringent emissions standards under both **European Union and United States EPA regulations**. It avoids the formation of dioxins and furans and is suitable for a wide range of waste streams, including **sewage sludge, plastics, biomass, medical waste and many other sources**.

In Germany and other EU-aligned frameworks, thermal recycling is recognised as a legitimate recovery pathway when it:

- Avoids combustion and direct incineration,
- Recovers usable energy or fuel from waste,
- Meets strict emissions and material recovery thresholds, and
- Supports circular economy objectives by avoiding resource destruction.

The CBR aligns with these criteria and is positioned as a **climate-aligned alternative to incineration**, particularly for waste streams that are otherwise landfilled or thermally destroyed. Its modularity and emissions profile, which has been officially certified in the EU as **Carbon Negative,** make it suitable for urban and industrial precincts seeking to meet **net-zero and circular economy targets**.

Given the NSW Government's stated commitment to circularity and emissions reduction, it is recommended that **non-combustion thermal recycling technologies such as the Concord**

Blue Reformer be assessed separately from incineration or other combustion based applications in a manner similar to those used for "cold" waste processing technologies, with appropriate regulatory and investment pathways that reflect their distinct environmental and operational advantages.

Section 4: Comparative Table – Concord Blue Reformer vs Incineration and Gasification

Source	Reference	Summary
Concord Blue	Concord Blue Technology Overview	Describes the CBR as a non-combustion, closed-loop thermolysis system producing ultra-clean syngas.
TÜV SÜD (Germany)	Carbon Negative Certification *available on request*	Confirms emissions compliance under EU environmental standards.
EU Circular Economy Strategy	European Commission Circular Economy Action Plan	Recognises thermal recycling pathways that avoid combustion and support material recovery.
Industry Commentary	Waste Management World – Advanced Thermal Recycling	Positions staged reforming and thermolysis as emerging alternatives to incineration and gasification

Section 5: Industry-Led Alliances Promoting Non-Incineration Waste-to-Energy Technologies

European Consortia

- **BV-HTC (Germany)** Consortium promoting hydrothermal carbonisation (HTC) for sewage sludge and organic waste. Includes municipalities, engineering firms, and technology developers. Explicitly positions HTC as a non-combustion alternative to incineration.
- **Zero Waste Europe – Technical Platform** Includes industry participants advocating for non-incineration thermal conversion technologies such as HTC, pyrolysis, and gasification. Supports EU taxonomy alignment and circular economy principles.
- **ISWA Working Group on Energy Recovery** International Solid Waste Association working group focused on energy-from-waste technologies. Covers pyrolysis, gasification, and reforming systems with emphasis on sustainability and emissions reduction.

United States-Based Platforms

- **Circular Carbon Network** Alliance of companies and investors promoting carbon-negative technologies, including pyrolysis and gasification. Advocates non-combustion pathways for organic waste and biomass.
- **Hydrogen Hubs and DOE-Funded Consortia** Regional hydrogen hubs (e.g. ARCHES in California) include waste-to-hydrogen technologies that avoid combustion. Promote reforming and gasification as cleaner alternatives to incineration.
- **International Biochar Initiative (IBI)** Global network supporting pyrolysis-based biochar production. Frames biochar systems as carbon-negative, non-combustion solutions for organic waste.
- **US Biochar Coalition** Industry group promoting pyrolysis technologies for waste valorisation. Positions biochar production as a sustainable alternative to incineration.

Other References

Germany's Circular Economy Strategy (NCES, 2024)

- **Source**: Federal Environment Ministry – NCES Overview
- **Summary**: Germany's strategy prioritises *waste prevention, reuse, and high-quality recycling*, aiming to reduce primary raw material consumption. Incineration is not promoted and is increasingly seen as incompatible with climate neutrality goals.
- **Additional Reference**: European Circular Economy Platform summary

European Environment Agency – Germany Waste Profile (2025)

- **Source**: EEA Country Profile – Germany (PDF)
- **Summary**: Germany's incineration rate remains high (30% in 2022), with *limited progress in recycling*, especially for plastics and wood packaging. The report notes that *no significant reduction in incineration* has occurred, despite circular economy goals.

EU NGO Moratorium Letter on Incineration (Sept 2025)

- **Source**: Zero Waste Europe – Joint Letter PDF
- **Summary**: Signed by 156 NGOs, the letter calls for an *EU-wide moratorium on new incinerators*, citing overcapacity (60 million tonnes), climate risks, and health harms. It urges investment in circular infrastructure instead.

Wales and Scotland – Incineration Bans

- **Wales**: Introduced a moratorium in **March 2021** as part of its circular economy strategy. Achieved **66% recycling** in 2022/23, with several councils exceeding 70%.

- **Source**: UKWIN Open Letter to Defra

- **Scotland**: Announced a ban on new incinerators in **June 2022**, following an independent review showing excess capacity.
- **Source**: STV News – Scottish Parliament Announcement

Heavy Vehicle Traffic and Road Wear

- Waste incinerators generate significant heavy vehicle traffic, including delivery of waste, removal of bottom ash, and transport of hazardous residues. This traffic can accelerate *pavement fatigue*, rutting, and surface cracking—especially on roads not designed for sustained heavy loads.
- Although not always isolated in studies, this impact is often bundled into broader environmental and infrastructure assessments. For example, the NSW Planning Portal submission titled *Waste to Energy Incinerator Dangers* includes technical papers and risk assessments that reference increased traffic volumes and associated community impacts.

Use of Bottom Ash in Road Construction

- The report *Waste Incineration and the Environment* (Zero Waste Australia, 2024) critiques the use of incinerator bottom ash in road base materials. It cites Nobel laureate Ernst Worrell's description of Dutch roads built with bottom ash as "linear landfills," due to the toxic and unstable nature of the material.
- Bottom ash can contain dioxins, PFAS, heavy metals, and other contaminants. If used in road construction without rigorous treatment and containment, it may contribute to *subsurface leaching*, structural instability, and long-term degradation.

Gaps and Opportunities for Further Research

- No comprehensive Australian study currently isolates road degradation as a standalone impact of incinerators. However, infrastructure and environmental impact assessments (EIAs) for proposed facilities often include traffic modelling and road wear projections.
- For stakeholder submissions, it may be strategic to request or commission independent traffic impact assessments and civil engineering reviews of bottom ash reuse proposals—especially if local councils are considering its use in public works.

Clayton Utz. (2022, February 3). *Proposed Regulation clarifies energy from waste opportunities in NSW*. Retrieved from https://www.claytonutz.com/insights/2022/february/proposed-regulation-clarifies-energy-from-waste-opportunities-in-nsw

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