

**Submission  
No 175**

## **INQUIRY INTO 'ENERGY FROM WASTE' TECHNOLOGY**

**Organisation:** Australian Industrial Ecology Network Pty Ltd

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# **Submission to the NSW Parliamentary Enquiry into EfW Technology**

May 2017

## What is the AIEN

The Australian Industrial Ecology Network (AIEN) is a vibrant network of like-minded individuals, companies and institutions with a common interest in sustainable development through the study and practice of industrial ecology. We advocate the principles and concepts of industrial ecology in policy formation and business practice. The AIEN actively engages with organisations to facilitate improved performance and environmental benefits.

The AIEN is also a forum in which people can discuss ideas, seek advice from one another, connect with resources associated with the practice and study of industrial ecology or simply keep in touch through the network with developments and best practice in their areas of interest.

The AIEN was established as a proprietary limited company in October 2014 to promote and facilitate industrial sustainability through the application of industrial ecology. The company aims to provide a 'window on the world' of industrial ecology by relaying news, canvassing new ideas, producing 'position papers' on topics, such as energy from waste, organising events and alerting people to developments in academia and in practice. In effect, AIEN aspires to become the 'go-to' organisation for all things to do with industrial ecology, including collaboration on the design, planning and implementation of IE projects.

## Introduction

In this submission, the AIEN makes some preliminary comments on the generally assumed concept of Energy-from-Waste (EfW) before specifically addressing the Terms of Reference (a) to (h). These comments relate to Justifiable Demand, Community licence to operate and a media release from Penny Sharp MLC Shadow Minister for Environment & Heritage, which fundamentally addresses the issues, referred to in this submission.

### **Media Release 6/4/2017 –**

*Labor MPs and councillors from across Western Sydney have been loudly demanding a thorough examination of the evidence base and practices involved in the ‘energy-from-waste’ industry – and Labor has now delivered on this much needed inquiry that can carry out a rigorous investigation into this new industry.*

*The proposed Eastern Creek incinerator will potentially burn more than one million tonnes of waste a year to power electricity generators – raising a long list of concerns from local residents – including that emissions, potentially harmful to human health and the environment, will be released from the facility which is close to homes and schools.*

*In addition, the Government’s own agencies, the Department of Health and the Environment Protection Authority do not support the current proposal.*

Labor’s push for an inquiry received support from the Christian Democratic Party and The Greens, which forced the Berejiklian Government to concede.

The point we wish to emphasize is that the AIEN submission is entirely apolitical. However, the sentiments expressed in this press release do clearly articulate that a Community Licence to Operate such a facility, as is proposed for Western Sydney, is currently problematic, as evidenced by this inquiry, which has been established to address doubts and concerns expressed by the residents of Western Sydney.

### **Main Reference for this Submission**

The AIEN makes this submission with principal reference to two documents. A WSROC report prepared by Eco Waste Pty Ltd. (Attachment B) and the ‘Sustainability Guide for EfW Projects & Proposals’ (SG/EfW 2004), (Attachment A). In our opinion, this continues to be the most authoritative document published, on the subject. It was sponsored by Australian Greenhouse Office, to address the following fundamental issues and questions: -

- a) Recovering energy from residual wastes, including the very significant question of what constitutes a residual waste? What is the sustainable market for the energy? Under what circumstances is such a binary approach (either/or - nothing in between) justifiable economically, environmentally and socially?
- b) How can all legitimate concerns of the community, in whose name such projects are promoted, be sufficiently addressed so that a 'Community Licence to Operate' is granted, even conditionally?

### **Background to the SG/EfW – Summarised**

The SG/EfW is an entirely self-explanatory document, in that:

- The circumstances of its initiation (very similar to the current Western Sydney situation);
- The methodology applied in the production of the SG/EfW including the comprehensive national community consultations undertaken to record and collate issues and concerns;
- The synthesis of the relevant issues into the final Six Project Scoping Principles adopted;
- The broad representation on the project editorial committee is recorded;
- The broad representation of the project reference group is recorded; and
- The full list and cross section of the project sponsors are recorded.

In adopting this SG/EfW as the major reference document supporting this submission, the AIEN acknowledges that the Waste Management Association of Australia (WMAA) originally published the work. In recent times, the current NSW Resource & Energy Recovery Working Group of WMAA has not referenced this work in its own submission to the inquiry and does not appear to hold with its fundamental concepts or assessment criteria for EfW project. The SG/EfW document is in the public domain and was primarily sponsored by the Commonwealth Government, the NSW department of Environment & Heritage (as it was then) and by numerous commercial entities (SG/EfW page 65). As such, the AIEN relies on the thoroughly and systematically developed conclusions and reimpress the view that they are so entirely relevant to the current circumstances being reviewed by this inquiry.

### **Assumption in the Terms of Reference**

The Terms of Reference (a) to (h) assume the EfW is an accepted term referring to the combustion of residual wastes such that:

- a) The volume of waste for subsequent disposal to landfill is significantly reduced (perhaps by >80%);
- b) The physio/chemical reactivity of such residuals (ash) is reduced;

- c) The energy recovered is a product with a fair and recognisable market or demand; and
- d) The recoverable materials in the wastes to be so processed have been removed prior to the final binary process of recovering a varying proportion of the inherent Calorific Value (CV) of the residual materials under management.

Often, the international facilities, designed and operated to achieve these outcomes are cited as the benchmarks of such EfW strategies.

With reference to the SG/EfW the AIEN submission challenges and/or re-defines:

- What a residual waste is.
- What the actual market and/or demand is for energy produced from such wastes.
- What alternative waste processing options are available to a community facing this choice.
- What the Justifiable Demand is for a 'traditional' EfW proposal.
- The conditions necessary to achieve a 'Community Licence to Operate' a facility, which is being proposed to service the community's clearly articulated needs and which is to be built and operated in their name, at their expense.

In responding to each of the Terms of Reference in turn, specific sections of the SG/EfW will be highlighted and discussed.

## Response to Terms of Reference

- a) *The current provision of waste disposal and recycling, the impact of waste levies and the capacity (considering issues of location, scale, technology and environmental health) to address the ongoing disposal needs for commercial, industrial, household and hazardous waste*

The primary purpose of NSW Waste levies is to increase the cost of simple (landfill) disposal to the point where systematic resource recovery is a more cost-effective outcome. This submission proposes that such a ‘tipping point’ has been reached, and that systematic resource recovery is not only the most cost-effective process option for the urban waste streams of Western Sydney, but that the fact that the community has agitated for this inquiry, is further evidence that the binary processing option for disposal of their residual wastes is not an outcome for which a freely granted Community Licence to Operate should be given. (SG/EfW Section 1 – especially 1.3.2 – 1.3.4). We also reference the WSROC report (*see Attachment B*) that sets out such a cost effective urban waste processing strategy.

In relation to the current provision of waste disposal and recycling services and outcomes in NSW, the primary focus of this specialist sector is only achieving the goals of protecting public health. They do not achieve the goals of systematic resource recovery, which the community is now demanding, as evidenced by the policy positions adopted by the relevant Government agencies. (SG/EfW Section 1.6 refers).

- b) *The role of EfW technology in addressing waste disposal needs and the resulting impact on the future of the recycling industry.*

EfW proponents will preface the justification for facilities, such as being promoted in Western Sydney, by asserting that they only intend to combust ‘RESIDUAL’ waste. Waste that have previously had recyclables removed and that therefore present as having “no higher resource value”. Such waste is to be terminally converted to at least realise inherent Calorific Value (CV). This ‘justification’ requires a description, if not a definition of what is meant by ‘RESIDUAL’ waste.

Before the advent of (yellow lid bins) kerbside recycling, residual waste was considered to be everything the community needed to discard, save only for those materials of interest to the ‘rag and bone’ sector.

Today ‘recycling options’ have expanded to include not only the (yellow lid bin) standard packaging items but also those materials that are the subject of an ever-expanding list of Producer Responsibility items. This trend represents a concerted attempt to reclaim as much of the biomass i.e. organic content of waste streams (usually >60% wet waste) as possible.

In this scenario alone, “residual waste” is not a static, universally understood term and, in fact, the evidence is that with every passing year, more and more of these materials are being transferred from the “residual” list to the recyclable/recoverable list. With the right policy settings, developed to truly reflect the community’s desire for optimised and systematic

resource recovery, the “residual” waste category is destined to represent an ever-decreasing volume of a region’s urban waste stream. See *Attachment B* for a truly integrated plan to actually achieve such an outcome).

This trend stands in stark contrast to the outcomes that will arise if very complex and expensive EfW plants are established to process what today is considered ‘residual’, as less and less material will logically fall into this category over time. The AIEN contends that the commercial drivers for and demands of such plants will directly impede, if not entirely prevent the development of future programs to maximise resource recovery, which are at the core of a successful circular economy.

There is then the issue of the market for the ‘black’ energy that will be produced by an EfW plant. It would be operating in a national energy market where the overwhelming focus is on closing coal fired, black energy plants in favour of clean or renewable power sources. It is noted, for example, that five coal fired power stations in Australia have been closed in the last 3 years.

EfW plants that combust plastics or all other ‘fossil’ based materials are considered only marginally less ‘black’ than pure coal fired facilities. It is only the biomass fraction in ‘residual’ waste that is assumed to improve the sustainability status of any energy derived from such plants. However, this is exactly the very fraction of waste streams that is receiving the most impetus to transfer them from a ‘residual’ to a ‘recyclable’ status. As Fig. 1 clearly demonstrates, in a sustainable resource paradigm, biomass will be ‘too valuable to just burn’.

**And Biomass is so much more than firewood!**

**Biomass – the Sustainable Competitive Advantage**

**Table 1: Comparison of benefits and properties of non fossil sources**

Low carbon energy sources	Features/Properties								
	A	B	C	D	E	F	G	H	I
	Renewable	On demand supply	Heat	Power	Gas	Oil	Char	PetroChem industry manufacturing precursors	Potential to be Carbon negative
Fossil fuels with sequestration		✓	✓	✓					
Hydro	✓	✓		✓					
Wind	✓			✓					
Solar – thermal	✓		✓	✓					
Solar – PV	✓			✓					
Geothermal	✓	✓	✓	✓					
Wave/Tidal	✓			✓					
Nuclear		✓	✓	✓					
<b>Biomass</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓

Whilst <100yrs biomass can be converted to fulfil all the roles currently provided by fossil resources – there is nowhere near enough – so should be applied to highest and best uses – bioenergy as a by-product.

**Figure 1: – Biomass is so much more than just firewood**



To extend this logic further, in a fast approaching paradigm, where the vast majority of biomass has been removed from residual waste, to support the manufacture of direct replacements/supplements for all products and services currently sourced from ‘fossil’ raw materials, only the oil based plastics will feature in ‘residual’ wastes and in that situation, such materials will also be much too valuable to burn since they can so readily be processed back into petro/chemical sector platform or precursor materials, such as methanol, naphtha and the like. Materials that average a commercial value currently of approx. \$1,000/t as compared to only \$30-\$50/t if converted for CV alone in an EfW plant.

In summary, the AIEN view is that in striving to achieve accurate criteria for assessing the best use of materials (SG/EfW PSP1 Section 3.3 pp33) ‘residual waste’ does not have a fixed definition. It is a rapidly diminishing category of a general waste stream, which yields a corresponding decline in calorific and hence economic value when used to generate thermal energy. The future status of EfW must be questionable in a market characterised by a rapidly falling demand for any resultant ‘black’ energy.

***c) Current regulatory standards, guidelines and policy statements overseeing EfW technology, including reference to regulations covering:***

- i. The European Union*
- ii. United States of America*
- iii. International best practice*

The AIEN view is that the SG/EfW can be relied upon to establish the appropriate regulatory framework for best use and application of the proposed materials under management in Australia. The relevant local authorities for example the NSW EPA, establish adequate standards for any potential water discharges or other impacts (see SG/EfW PSP 3). The EU Waste Incineration Directive is a suitable guide in relation to any possible plant emissions. It is noted, however, that practice and experience overseas should be considered with great care and attention to details, given that the geographic, demographic and urban conditions in this country are very different to the much more densely populated regions of NW Europe of the USA.

***d) Additional factors which need to be taken into account within regulatory and other processes for approval and operation of EfW plants***

This submission relies on the consensus standards established in the attached SG/EfW to address all the direct and indirect factors that should be transparently taken into account when assessing planning and licencing applications for EfW facilities.

*e) The responsibility given to state and local government authorities in the environmental monitoring of EfW facilities*

Apart from addressing the direct economic, social and environmental impacts of such proposed facilities, the Community Licence to Operate must be given primacy, since such facilities are developed to service these same communities and doing so in their name and at their expense.

*f) Opportunities to incorporate future advances in technology into any operating EfW facility*

As the CEO of Sustainability Victoria stated in his key note address to the recent Australian Waste to Energy Forum in Ballarat (Feb.2017), in his opinion, the role for large European style incinerators with energy recovery capabilities, was not obvious, but that the role for smaller, feedstock specific facilities, such as agricultural anaerobic digestion (AD) plants, was entirely appropriate and relevant to the future needs for sustainable energy production and waste treatment needs. This statement entirely encapsulates the view of the AIEN, which we take to be incontrovertible.

*g) The risks of future monopolisation in markets for waste disposal and the potential to enable a “circular economy” model for the waste disposal industry, and*

As discussed above (item b) and referenced in SG/EfW Section 2.4, the community is most concerned by the problem of ‘the tail wagging the dog’ Once established, large EfW facilities will ‘suck in’ ‘residual’ wastes to keep the plant operating at design throughput and efficiency, as the over-riding priority. This demand for waste with sufficiently high calorific value, invariable required to be supplied under long-term contracts, operate very much to the detriment of legitimate community needs and aspirations (see Sweden and Germany as classic examples of this syndrome).

The SG/EfW was developed to address this specific issue and the resulting PSP framework was the overwhelming consensus outcome.

*h) Any other related matter*

AIEN would be pleased to make a personal presentation to the committee to expand on this written submission.