

Submission
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INQUIRY INTO 'ENERGY FROM WASTE' TECHNOLOGY

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SUMMARY

The TEC/Boomerang Alliance has adopted the following policy in relation to energy from waste:

“Any waste to energy process presents serious inherent risks to human health and the environment. There is no thermal process to capture the embodied energy value of mixed waste that will not create significant pollution and toxic releases.

Australia’s export of unprocessed waste to developing nations for supposed WTE operations is also unacceptable and continues to cause significant health and pollution events across South East Asia.

We oppose the creation of fuels and/or incineration or pyrolysis of: municipal solid waste, hazardous, medical and any other mixed waste stream. TEC/Boomerang Alliance will however, consider the merit of WTE proposals (on a case by case basis) for a genuine source separated and maximised recycling operation (in contrast to a dirty MRF) that produces a very small amount of residual material that cannot be used for a higher order of recovery and can demonstrate toxic and pollution risks have been extinguished by pre-testing of the batches.”

In adopting this policy TEC/Boomerang has considered that in very limited circumstances, WTE involving such residual material supports the higher level and maximised recycling because it improves the financial basis for such recycling, especially in the face of increasing landfill waste levies. However it is also aware that such an apparent ‘concession’ may be misused by industry proponents and is wary of endorsing any energy from waste proposals.

End of life tyres present a difficult challenge. In the case of end of life tyres converted to chip, it is not possible for producers to pre-determine their end use, as tyre chip can be used for recycling or WTE. Tyre chip is far more preferable to stockpiling whole tyres (also generally prohibited from landfilling) which creates serious disease and fire risks; and their export to Asia where pollution and disease controls are sub-standard. Chipping also bears a cost to the recycler that needs to be recovered and clearly chip stockpiling has limited utility. Nevertheless TEC/Boomerang encourages minimal use of tyre chip in WTE and growing use for recycled purposes.

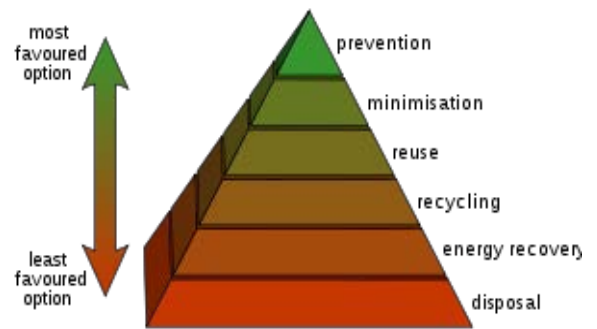
Waste to energy proponents (industry and councils) tend to focus on ‘diversion from landfill’ as the key metric when the central metric for a waste strategy is recycling of recovered waste. The diversion focus is essentially greenwashing. It is often associated with a dirty MRF not a genuine source separating facility. We also guard against claims there will be a ‘residual ash’ as if it is may not be an important issue. Some plants produce a high level of residual ash, which is toxic and will need additional treatment and landfilling.

INTRODUCTION

The waste industry has been trying to trigger the development of a thermal waste to energy (WTE) sector for over 10 years. Recently a number of states have released policies that anticipate the establishment of facilities. Government policies contain a variety of conditions about pollution and required higher order activities (e.g. recycling and composting) but are inconsistent and largely inadequate.

We respect the waste hierarchy which, in Australia, has traditionally included waste to energy as the core component of recovery, but least favoured (see right).

In conversations with government and the industry we consistently highlight the dangers of waste to energy (WTE) including cannabaising resources for a single use, rather than repeated and higher value recycling; the range of thermal applications being proposed and their potential to create significant toxic pollution.



Most typically, we see operations that should obviously be opposed as they are simply another form of cheap disposal. However, there is a second stream of applications where a fuel is produced as a small residual fraction of a legitimate recycling operation. While we can caution these proponents about the dangers of WTE, we cannot oppose the overall recycling development. By way of example the following is a very short case study of one operation with which we have been engaged:

*Sita/ResourceCo was the first facility to construct and sell a Resource Derived Fuel (RDF) in Australia (Adelaide). They engaged with us at the development, testing and expansion phase of their operation. Fuel construction was a key aspect to making the ResourceCo proposed operation viable and involved them expanding ResourceCo's **recycling** output from 750,000 tonnes p.a. to over 2million tonnes p.a. This operation was accompanied by the Sita/ResourceCo manufacture of between 150-200,000 tonnes of RDF (around 9% of their throughput). On inspection we recognised that the operation was different to the major proponents of WTE plants:*

- *The sorting operation funded by the WTE facility actually lifted their recycling rates by a further 120,000 tonnes p.a. (decreasing their residual material for the fuel plant from 16% to 9%)*
- *It was vital to the operation's viability (because if they landfilled the residual material they needed to increase their gate fee by 9.9% compared to the rest of the sector which stockpiles and has seen over 2million tonnes of material spread across the industrial suburb of Wingfield – causing some 8 fires over the past 18 months); or it could create a fuel to offset its additional expenditure.*
- *As a result of the above less than 1% is landfilled (mostly low level contaminated soils).*

During our ongoing engagement we have made it clear we cannot support WTE and suggested that while it was a genuine residual they needed to demonstrate a world's best practice level of risk mitigation. As a result Sita ResourceCo developed a strategy that included:

- *Only Source Separated Recyclables could be accepted at the operation;*

- *That waste deliveries were not mixed together before sorting (improving the ability to isolate contaminated materials)*
- *That the fuels would be separately batched (into lots of 25 tonnes) and that the site's lab would undertake around 5 tests to check for contaminants before the fuel was sold (this is the only WTE operation in the world monitoring for toxics before burning – the rest monitor emissions at the stack)*
- *That BA would have open access to both the site and their records.*

Further it needs to be recognised that a focus on companies generating energy from waste is a partial view – the vast majority of WTE operations do not directly generate power – they make and sell a fuel which is far less visible than a power plant itself.

There is also some concern regarding what is (or isn't) acceptable in Australia, while largely ignoring that materials are exported for use in operations that are seen as unacceptable in Australia - to our developing nation neighbours whose standards are considerably lower - consequently resulting in increased pollution and undermining the Basel Convention. By our estimation the amount of 'fuel' and waste being exported for fuels, represents some 2.4million tonnes p.a. This creates serious challenges to national government and is arguably a very serious issue for export controls.

For example around 70% of all waste tyres are shipped (either as unprocessed waste or chipped material) for burning often with toxic emissions, in Vietnam, Malaysia and China. Also, the Federal Government's E-Waste scheme has not controlled the final fate of electronic components and much of the recovered material is bound for unsafe polluting incinerators across Asia. Similarly, discussions with industry experts indicate that around 50% of scrap plastic exported to S.E. Asia is low grade unsorted material bound for incineration, not recycling.

TEC/Boomerang Alliance's Historic Position

To date, TEC/Boomerang Alliance has not offered its support to any new WTE operation. Key issues where TEC/BA has engaged within the WTE are as follows:

1. Exemption or reduction of waste levies for WTE operations. TEC/BA has put the position to state (NSW, Victoria, SA and Western Australia) and federal (within the development of its National Waste Policy and e-waste, tyre and packaging stewardship programs) governments that waste to energy is not recycling and must not be referred to as such and should attract waste levies. This position has been heard **but it** would be naïve not to outline that waste levies tend to be triggered at the landfill site meaning that incinerators, pyrolysis plants, fuel operators and Alternative Waste treatment (AWT) operations producing or using fuels are not captured by current government levy tools.
2. We have supported the notion of methane gas capture and extraction of existing landfills since our inception but have at all times maintained a position that these approaches continue to be little more than a minor abatement strategy for disposal operations and should not be justified as climate change abatement strategies; nor cannabalise resources, or be supported with government monies or receive any exemption / incentive as a pathway to waste management. The giant Woodlawn Bioreactor (tip) near Goulburn is an example.

3. Over the past 5 years we have been approached on a number of waste to energy operations that aim to either create a waste derived fuel and / or process mixed waste or waste residuals (e.g. operations behind a dirty MRF, an AWT facility, or a composting operation). At all times our position remains unequivocal – TEC/Boomerang Alliance is opposed to thermal treatment of such waste.

The core issues we outline to justify this position are:

- i. Any waste management company whose core business is the collection of waste is geared towards a lowest cost of disposal mentality. It will, at best, cherry pick to recover high value recyclate rather than seek to recover any viable recyclate.
- ii. Mixed waste has high levels of contamination caused during collection and compaction. The thermal treatment of waste that is unsorted will result in the release of dangerous pollution no matter what technology or management regimes are in place.
- iii. Pollution monitoring at waste facilities is post incineration (testing releases from the smoke stack) and is nothing more than closing the gate after the horse has bolted.
- iv. The processing of waste for energy recovery and reducing landfill disposal as the primary goals do not respect the higher order of recovery reflected in the waste stream.

Outside of specific materials recycling operations (like tyres) we have engaged with 6 operations / proposals that are for a genuine residual from source separated recycling collections. Our feedback to these operations (outside of other specific issues identified) has been:

- We don't support the mass creation of fuels as recycling; it is a lower order (and less desirable) order of recovery and must be described in a manner that reflects this.
- In order for us to not overtly oppose an operation that either thermally processes recyclate or creates a fuel for energy it must demonstrate that it has moved well beyond the regulatory standard. Key management processes that must be adopted include:
 - o That processed material is only collected by a source separated recycling operations;
 - o That all material is processed through a recycling MRF (not a dirty MRF) and batched into individual lots (which isolates potential contamination of toxic or hazardous materials);
 - o That each batch processed is constructed to a pre-defined material mix that minimizes any potential pollution event and allows review where toxics are identified in later processing;
 - o That the point of collection for these materials are recorded so any event can be addressed with the waste generator;
 - o That they have specific screens in place to identify materials known to cause toxic spikes – e.g. arsenic treated timbers, PVC;
 - o That every batch must be lab tested to identify contaminants before it is dispatched as a fuel (i.e. before the pollution is released);
 - o That TEC/BA, and the public, have open access to their records and a right to inspect.

For example, Visy have a licensed operation in Victoria that processes the residual plastics from their bottling plant and kerbside recycling plant. The materials are used in their gassified RDF plant were PET and LDPE that had a low level of organic contamination that excluded it from use for food grade recyclate (the major plastic product Visy makes). We rejected this development (and expansion to other operations) on the basis they did not have a testing regime pre burning and as such the risk of a toxic spike was still possible. Visy consequently agreed to defer any expansion until they could offer a solution to this procedural gap and is undertaking some \$5million in site works and additional screening machinery to try and mitigate the risk we identified.

4. **Tyres:** The notable exception to the above is end of life tyres (ELTs). Tyres have a relatively high specific energy content, making them a popular fuel source. No jurisdiction in the world regulates the construction of fuel from tyres – they police the circumstances in which it is burnt. Globally, ELTs are used in a variety of waste to energy applications, namely:

- Dirty waste incinerators (Vietnam, China, India, Malaysia) which burn a variety of wastes for a marginal energy gain while producing significant pollution. Around 40% of Australian waste tyres are sent to these destinations (it was 70+% as recently as last year);
- In pyrolysis plants to convert rubber and polymers into bunker fuels, carbon black and recycled steel (Malaysia, Korea, Japan, Europe);
- Use of the first stage ELT recyclate, rubber chip, as Tyre Derived Fuel (TDF) as a lower emission solid replacement to thermal coal (in concrete plants like La Farge Malaysia).

So far, the global market for rubber recyclate is limited to around 50% of the ELTs generated; meaning energy recovery options are inevitably in the mix to manage the entire ELT waste stream without considerable stockpiling (leading to dangerous disease and fire risks). While it is relatively easy to identify and oppose operations that use whole tyres as a fuel source, tyre derived fuels are much more difficult, as the first stage of recycling – tyre chip - is exactly the same product as TDF.

Consequently, tyre reprocessors sell chip and were often unaware of the purpose for which their chip is used. To combat this, TEC/Boomerang Alliance has developed a program with the Australian Tyre Recyclers Association (ATRA), consistent with guidance provided by the Basel Convention, to ensure that we know the final destination of chip. In all instances, ATRA receives proof that the operator only exports with the explicit approval from the receiving government for - the importation of the product; its intended use; and the facility receiving the material.

To this end when considering the best pathway for ELT disposal, we have engaged with the industry with the following advocacy:

- Whole tyres should NEVER be used in incinerators, furnaces or boilers;
- Whole tyres should NEVER be exported to developing nations;
- Chipped tyres (TDF) only deliver any sort of GHG abatement when replacing brown coal in energy plants specifically designed and permitted for the use of chipped rubber;
- Tyre chip should only be shipped to developing nations with the explicit written consent of the nations receiving them;

- All recyclers must demonstrate their pursuit of recyclate markets such as rubber crumb and granule markets with chip and TDF being targeted for the residual;
- There is no universal standard for tyre pyrolysis. Some are sophisticated operations representing as much as \$50million AUD in capital investment while others are little more than a backyard operation akin to cooking rubber on an open fire with little to no pollution control. To date the only safe and sustainable pyrolysis operations in the world are 3 plants that focus on producing high grade recycled carbon black for tyre to tyre recycling (which is the only way to create a tyre to tyre recycling product) and steel. Those operations seeking to produce bunker fuel as their primary output should be viewed with suspicion.

At the time of publication there are 12 tyre ‘chipping’ plants in Australia with three operating crumbing lines (though it should be noted that one of these plants services five chipping operations) and one legal pyrolysis ‘test’ plant (2 known unlicensed tyre pyrolysis plants without development consent also exist).

Tyre chipping comes at a cost that needs to be recovered. The adverse consequences of stockpiling whole tyres are enormous. Over and above the considerable risks to spread vector-borne disease, tyre fires are amongst the most common and polluting. NSW fire records show that between 2008 and 2013 there were 322 fires involving tyres including 55 tyre storage facilities. Tyres are also one of the most problematic materials that are illegally dumped – we have identified over 50million illegally dumped tyres across Australia.

TEC/BA believes that TDF with strong conditions, should be used in Australia in preference to its current export to developing nations – as in Australia, we can both monitor and control any issues.

What about transition?

While the ultimate objective is ‘zero waste’ diverted from landfill **and** recycled – this will inevitably take a significant amount of time to achieve. The serious question arises as to what to do, in the interim, about the remaining significant residual, after it has been subject to the best available recycling practises (say 10% residual). Inevitably it will be landfilled, stockpiled above ground, or exported to countries with lax pollution controls. Domestically it has partly driven support for WTE.

Above ground stockpiling is unacceptable and a serious issue - one facility in South Australia has been found to be stockpiling (with permission) over 2.5million tonnes of untreated waste. This stockpile has experienced 6 fires in the past 18 months releasing significant toxics; and it is harder for stockpiles to have effective pollution and leachate controls.

This is particularly evident in the case with tyres (NSW Fire records indicate that 55 waste tyre storage facilities had fires in the past 5 years) which not only emit toxics when they catch fire but as whole tyres, are also habitat for disease carrying mosquitoes. Whole tyre stockpiles are very dangerous; landfilling of whole tyres is already generally prohibited.

We have also seen weak controls on above ground landfills of construction material in South Australia, Victoria, Qld and NSW which have experienced major pollution releases and / or caught fire.

The NSW Government has moved to reduce the incidence of these stockpiles by imposing the waste levy at the point of storage – and only allowing levy relief when it is recycled.

Consequently as waste levies rise – WTE becomes more attractive to avoid the levies and some of the collection and MRF costs can be recovered. This does not mean that TEC/Boomerang supports such practises, but it does mean policy should engage to obtain alternative recycling approaches.

A final significant consideration where WTE plants are linked to a dirty MRF is that WTE plants require a 20+ year supply contract (reinforced by financing arrangements). MRF contracts with councils are typically up to 10 years. Consequently, WTE can lock out improved material separation and recovery technology and practises that could have occurred with renewal of the collection and MRF contracts.

Thermal Treatment Risk Hierarchy

The risks of pollution releases to our knowledge would be as follows:

1. HIGH RISK:

- Any mixed waste collection
- Any residual from AWT
- Sorted waste and/or recycling behind a dirty MRF or AWT
- Unsorted material whether waste or recycle
- Hazardous & Medical Waste
- Green Waste
- Export of untreated waste (as it is likely to be incinerated)
- Residuals from equipment and machine recycling (e-waste, shredder flock from vehicles).

2. INTERMEDIATE RISK:

- Fuels constructed from source separated MSW and C&I recycling residuals
- Pyrolysis Plants (though some proposals should be considered high risk)
- Post MRF C&D recycle (has a high proportion of low risk residuals).

3. LOW RISK, could be allowed with stringent conditions:

- Chipped waste tyres (limited crumb market and allowed in every developed nation)
- Small residual from single source collection streams when integrated with a recycling (not 'recovery') operation that sells a higher order product
- Won't morph into a less acceptable project, ie based on small modules.