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27 January 2017

Ms Helen Butterworth
Office of the EPA
Senior Environmental Officer
Mining and Industrial Branch - South

Referral of Revised Proposal - East Rockingham – Waste to Energy Facility (EPA Assessment 1513, Ministerial Statement 994)

Dear Helen,

Further to our meeting with you and Richard Sutherland on 21 December 2016, please find below a brief summary of the revised basis for our proposal for the East Rockingham Waste to Energy Facility together with a completed referral form.

As discussed at the meeting, New Energy is seeking environmental approval for the revised proposal and wishes to pursue the simplest and quickest possible approach to achieving approval while ensuring compliance with EPA policy and practice and ensuring the community is appropriately consulted.

Please contact me directly with any questions regarding the information we have provided and we look forward to discussing this with you and the EPA Chairman as discussed.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Jason Pugh', is shown on a light blue background. The signature is fluid and cursive.

Jason Pugh
CEO



East Rockingham – Waste to Energy Facility (EPA Assessment 1513, Ministerial Statement 994) Proposed Revision

Purpose

This document summarises the nature of changes proposed by New Energy Corporation (NEC) to its approved Waste to Energy Facility in East Rockingham and the reasons the changes are required.

New Energy wishes to gain approval for the revised project in the shortest possible time.

Reasons for the Change

Since obtaining final environmental approval for the facility, New Energy has completed the following tasks:

- Appointment of an EPC contractor
- Completion of a Front End Engineering and Design Study
- Lodgement of a Tender to secure the rights to 150,000 tpa of waste from the Rivers regional Council
- Discussions with numerous other suppliers of waste including several local governments and Government authority
- Protracted negotiations with significant power users to secure long term power contractors
- Negotiations with a number of debt and equity finance providers

It has become clear to NEC that there is sufficient uncertainty in regard to the ability of the Entech technology to reliably treat MSW and produce power at the proposed scale that NEC is highly unlikely to secure contracts for sufficient waste to achieve financial closure for the facility.

NEC is also aware that several local and regional councils will seek tenders for processing of the waste under their control over the next 18-24 months and if NEC is not in a position to offer a credible tender, then it will have missed the opportunity to secure sufficient waste to underpin the project. The Councils are demanding that tenderers offer proven technologies for waste to energy and that means tenderers must offer best practice grate combustion technologies.



As a result NEC determined that it was necessary to revise the project design to utilise a proven grate based incineration technology in order to be able to compete effectively with other players in the market.

NEC has undertaken a comprehensive review of the available grate incineration technologies to identify technologies that represented the smallest possible departure in design philosophy from the Entech gasification system while also having a large installed base of facilities handling municipal waste.

NEC finally selected the HZI technology because of the following factors:

1. HZI was highlighted in the EPA Section 16 advice as “State of the Art Technology”. The technology was highlighted as one of the case studies in the WSP Report dated January 2013. NEC reviewed this document when considering potential technology providers worldwide.
2. HZI has a large installed base of facilities of similar or larger scale successfully handling Municipal Waste (leading project developer in Europe). The reference facilities also include very recent installations to ensure the technology is World’s Best Practice.
3. The HZI technology has some innovative features which mean that it has a similar performance envelop to the Entech gasifier. Key to this is HZI’s LEAP technology which operates the primary grate at sub-stoichiometric conditions in terms of air feed so that that the conditions in the primary combustion areas are not dissimilar to that in a gasifier. As a result, a relatively high calorific value syngas is released from the bed which is subsequently burnt high in the incinerator chamber. This approach is quite similar to the Entech technology, although in the case of the Entech gasifier the syngas is burnt in excess air in a separate syngas burner chamber.

The end result is a similar final gas volume with similar characteristics in terms of temperature which is presented to a boiler which is specifically designed for Waste to Energy purposes to achieve the rapid temperature quench that minimises *di novo* synthesis of dioxins.

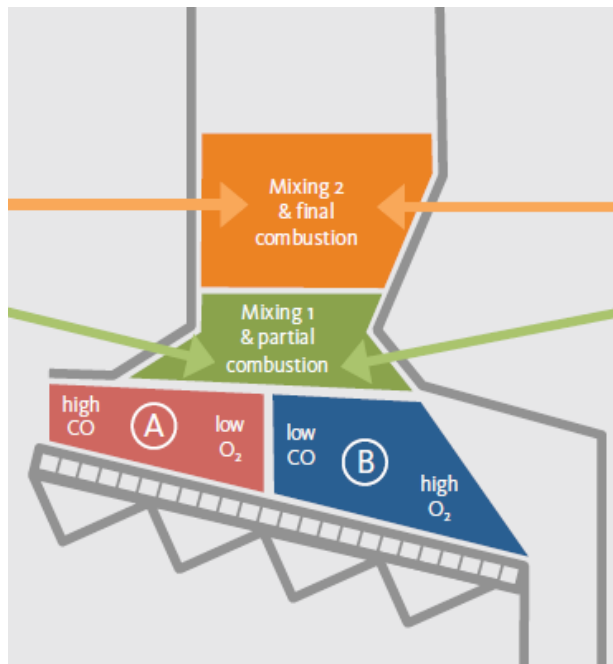
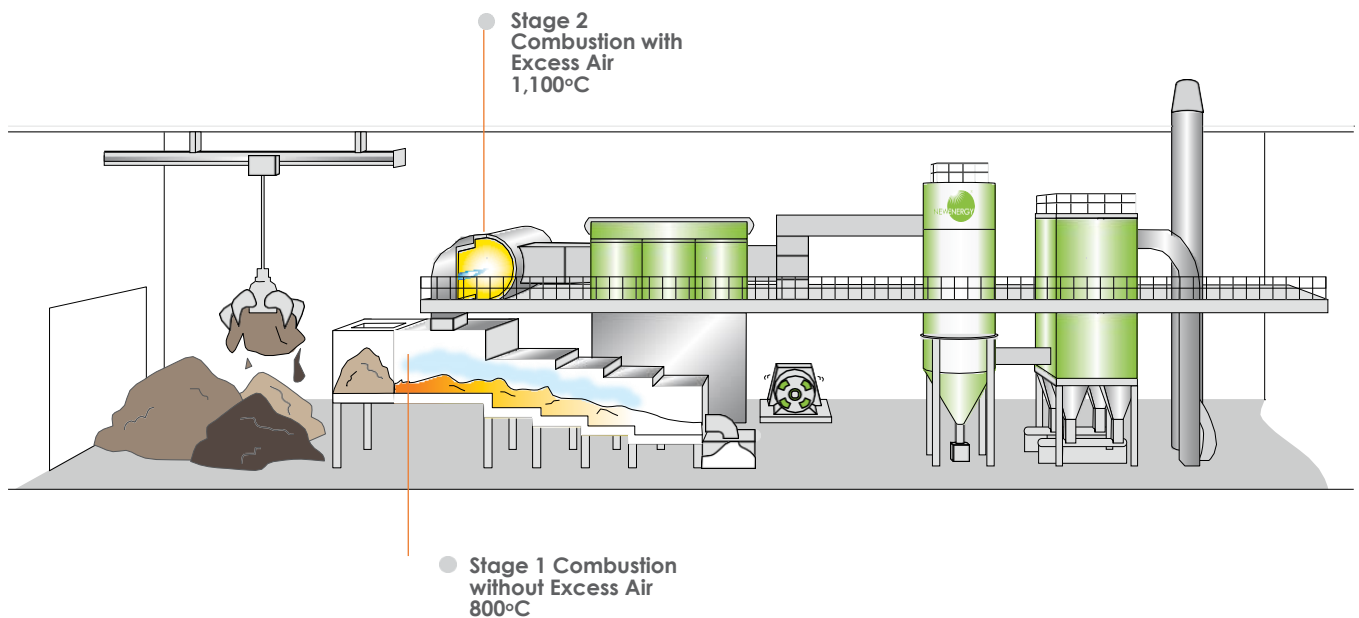


Plate 1: The HZI Low Excess Air Process



It's important to note that the final stage combustions from both processes occur at a temperature of around 1,000°C. This means that both processes will effectively destroy dioxins and other air toxics produced during the combustion process.



While the HZI technology does offer a reduction in turbulence in the area of the grate, there is still a slight increased loading of particulates in the gas stream presented to the boiler and scrubbing system when compared to the Entech system and as result the scrubbing system for the HZI system has enhanced capacity to ensure that the final air quality emitted from the stack comfortably meets the WID emission criteria.

4. A further advantage is that HZI will act as EPC contractor and operator for the facility as well as supplying all the key equipment for the facility. This is particularly pertinent as the Project moves to part V Works approval and the emphasis the EPA has placed on that process.

Comparison of Key Features of the Revised Proposal with the Current Approval

TABLE 1 : KEY CHARACTERISTICS TABLE

ELEMENT	DESCRIPTION	NEW DESCRIPTION	COMMENT
GENERAL			
Proponent	New Energy Corporation Pty Ltd 12 Parliament Place West Perth WA 6005	Unchanged	Unchanged
Proposal Description	Construction and operation of a waste to energy and materials recovery facility	Construction and operation of a waste to energy facility with C&I/C&D MRF	Materials Recovery Facility for MSW removed from the Proposal Description
Project Location	1 Office Road, East Rockingham	Unchanged	Unchanged
Gasifier/Incinerator Thermal Capacity ¹	72 MW Notional	101.8 MW	Increased as a result of increased waste feed capacity.
Generation Capacity	18.5 MW An estimated 16 MW fed into the SWIS	30.8 MW An estimated 27.7 MW fed into the SWIS	The change to HZI BAT grate combustion system provides better energy efficiency than the original proposal. This is achieved by advances in boiler and plant operating systems.

ELEMENT	DESCRIPTION	NEW DESCRIPTION	COMMENT
Construction Period	Approximately 12 months	Approximately 30 Months	The construction period set in the proposal as described in the PER was an estimate developed before the Front End Engineering and Design (FEED) had been completed. Following completion of the FEED, construction time for the project was revised by the appointed EPC Contractor to 18 months. This is consistent with the expected time of construction for the HZI moving grate combustor.
Life of Plant	Notionally 25 years	Unchanged	Unchanged
FOOTPRINT			
Native Vegetation Clearing	10ha	Unchanged	Unchanged
INPUTS			
Power	2.5 MW parasitic load	3.7 MW parasitic load	Due to larger plant capacity.
Water	Approximately 100,000 kilolitres (kL)/annum from scheme water	Notionally Unchanged	No significant change is expected but this will be confirmed during the detailed design phase.
Waste Throughput	225,000 tpa nominal to be received on-site	300,000 tpa nominal to be received on-site	Larger capacity plant in response to expected market demand.
FEEDSTOCK WASTE SPECIFICATIONS¹			
Waste Reveal for Gasification ²	Nominally 225,000 tpa of MSW, residuals from processed C&I, C&D waste. Residuals from Mechanical Biological Treatment Material	300,000 tpa of MSW, residuals from processed C&I, C&D waste. Residuals from Mechanical Biological Treatment Material	Largely unchanged except for the addition of dewatered biosolids which are available from the adjacent Water Corporation wastewater

¹ Facility capacity is determined by the notional thermal capacity of the gasifiers.

² Waste volumes are notional and will vary according to the actual calorific value of waste being processed.



ELEMENT	DESCRIPTION	NEW DESCRIPTION	COMMENT
	Recycling Facilities.	Recycling Facilities. Dewatered biosolids and other high calorific value organic sludges	treatment plant and the option of accepting other organic rich sludges such as tank bottoms from oil refineries. New Energy will seek to include a mechanism in the revised proposal to allow the addition of other comparable waste types via approvals under the Part V licence.
Waste Disposal – off-site, recycling or re-use ²	Approximately 94,000 tpa	Approximately 30,000 tpa	Bottom ash will be recycled using proven HZI processes.
PROCESS WASTES			
Bottom Ash	Estimated at 3-10% of waste input to gasifier. Wastes to be collected and disposed to landfill	Estimated at 20% of waste input to incinerator. To be conditioned for reuse as aggregate and road base. HZI currently do this and many operating European facilities.	The % of bottom ash has increased primarily as a function of eliminating the Materials Recovery Facility. The MRF also targeted inert products such as sand, bricks, glass and fines. Both technologies produce an ash with less than 3% carbon (LOI) so it is not accurate to say one is more efficient than the other.
Scrubbing system residues	Estimated as < 1% of waste input. Wastes to be collected and disposed to landfill	Estimated as 4.2% of waste input. Wastes to be collected and disposed to landfill	The % increase in scrubbing system residues comes from an increase in load on the air quality control system.
Wastewater	<ul style="list-style-type: none"> Estimated 2.5 kL/day of wash down water 5KL/day of water from the Water Treatment Plant. Boiler feed water circuit blow down to be 	Essentially Unchanged	Unchanged

ELEMENT	DESCRIPTION	NEW DESCRIPTION	COMMENT
	<p>recycled.</p> <ul style="list-style-type: none"> • The final disposal option will be determined at Works Approval Stage from following options: <ul style="list-style-type: none"> • Off-site disposal via reticulated sewer; • Evaporation through the gasifier; or • Thermal evaporation using waste heat from the gasifier. 		
Sewerage / grey water	Disposal via reticulated sewer.	Unchanged	Unchanged
DESIGN SPECIFICATIONS		Unchanged	Unchanged
Scrubbing System	Dry reagent and adsorbent injection (DRI) into a DRI reactor followed by a compartmentalised pulse jet fabric filter baghouse filtration (FFB).	Unchanged with the exception of the addition of SNRC technology for improved NO _x performance.	The scrubbing system and best practice combustion control will result in excellent emission results which will be very similar to those from the project when based on the Entech gasifier and fully compliant with the requirements of the WID Directive. The ambient concentrations due to these emissions will be modelled and we are confident they will show that the air emissions from the revised proposal comply with relevant standards, be similar to those presented in the PER and will not contribute to a

ELEMENT	DESCRIPTION	NEW DESCRIPTION	COMMENT
			detrimental effect on the environmental in the Kwinana airshed.

Environmental Factors for both the Original and Modified Proposal

Flora and Vegetation:

Potential impacts include:

- Direct loss of 10ha of native vegetation;
- Indirect impacts to native vegetation associated with: Introduction and spread of weed species
- Fire; and
- Spread of windblown rubbish.

Fauna:

Potential impacts include:

- Direct loss of 10ha of native vegetation which may provide habitat for a range of species.
- Direct injury or loss of fauna (particularly sedentary species) during site clearing.
- Potential attraction of feral animals and pests.

Surface and Groundwater:

Potential impacts include:

- Contamination of surface water or groundwater due to spills on site, drainage from waste storage or the inappropriate management of wastewater.
- Impacts on groundwater levels.
- Stormwater will be generated via the construction of impervious surfaces.
- Promotion of mosquito breeding in water holding infrastructure.

Noise:

Potential Impacts

- There are numerous adjacent industrial, light industrial and commercial premises within 1km, which could potentially be impacted by noise.
- The nearest residential area is more than 2.5km from the site.
- Cumulative impacts arising from the plant in conjunction with other noise emitters could impact sensitive receptors.
- Modelled noise emissions indicate that the facility will not impact the nearest sensitive receptor. Noise is therefore not likely to be a significant environmental factor.
- The provision of appropriate zoning and reservation in and around the RIZ will mitigate risks associated with urban encroachment.



Air Quality:

Potential Impacts

- Potential impacts include:
- Dust emissions during the construction period.
- The waste to energy plant is combusting a range of wastes including plastics and then combusting the syngas. This process has the potential to liberate a range of airborne contaminants in the exhaust gas stream including heavy metals, dioxins, other toxic organic compounds and acid gases including SO_x, NO_x, HCl and hydrofluoric acid (HF).
- The plant will handle putrescible material and therefore may result in odorous emissions.

Greenhouse Gas Emissions:

Potential impacts include:

- The combustion of waste will generate greenhouse gases. It is estimated that during the construction stage of the waste to energy facility approximately 1,500 tonnes of Carbon dioxide equivalent (CO₂-e) will be emitted based on diesel consumption by construction machinery.
- Greenhouse gas emissions will result from combustion of carbon in the waste fed to the gasifiers and from the combustion of fossil fuels in the auxiliary burners.
- However, these emissions will be offset when considering:
 - the reduction in greenhouse gas emissions that would have been generated from the decomposition of the waste if it were landfilled; and
 - the emissions that would be generated from a natural gas fired power plant to generate the equivalent quantity of electricity.

Waste Management:

Potential Impacts

- In the absence of this project the current situation will continue with valuable resources lost to landfill.
- The implementation of this project allows the recovery of energy from waste that would otherwise be landfilled. This is consistent with the waste hierarchy.
- The project is being driven by demand from local governments who are seeking alternatives to landfill by calling tenders for Waste to Energy Facilities

Changes to the extent of environmental Impact due to the Revised proposal

Flora and Vegetation: no change from the original proposal.

Fauna: no change from original proposal

Surface and Groundwater: no change from original proposal.

Noise: noise will be remodelled to confirm no change from original proposal.

Air Quality: air emissions will be remodelled to confirm changes from original proposal. It is



envisaged that there will be little change in the ambient concentrations of the key pollutants from those presented in the PER.

Greenhouse Gas Emissions: Little change is expected from original proposal.

Waste Management: no significant change in approach or scale of impact

The detrimental impacts from the revised project are in the main similar to the project as originally described in the PER. There are some areas where additional environmental benefits are offered by the revised project while in some other areas the revised project has a slightly larger environmental footprint. The following table summarises the position. NEC will provide detailed information in our formal submission to confirm the positions outline below

Environmental Factor	Expected Outcome
Air Emissions	No significant change
Noise Emissions	No significant change
Flora	No significant change
Fauna	No significant change
Water Use	No significant change
Diversion of Waste from Landfill	The total amount of waste diverted from landfill is expected to be similar given the adoption by local governments of a third bin to recover organics separately.
Solid Waste Disposal (other than Bottom ash and Scrubbing System Residues)	The revised project configuration will produce substantially less solid waste requiring disposal to landfill.
Bottom Ash and Scrubbing System Residue	The quantities of bottom ash will increase due the change in technology from the gasifier and the removal of the front end sorting system.
Energy Efficiency	The revised project has a slightly higher overall thermal and electrical efficiency.
Greenhouse gas emissions	Little overall change other than a slight reduction due to the increased energy efficiency of the HZI technology.
Technology Risk	One of the concerns expressed by EPA in regard to the Entech gasification technology was that it was not proven at the scale of the proposal and in using municipal Waste as a feedstock. This concern is completely removed by adoption of the HZI technology which was selected by NEC because of its huge installed base of facilities of similar or larger scale handling municipal waste.

Discussion

As mentioned in the covering letter, NEC is keen to achieve the simplest and quickest possible approval process that is consistent with sound Environmental Impact Assessment practice. We see that the that the key environmental factor for both the original proposal



and the revised proposal is Air Quality and the need to demonstrate the revised facility will comply with relevant air quality criteria in terms of both emissions performance and predicted ambient concentrations. This needs to be done for the full suite of emission parameters including:

- Particulates
- Nitrogen Oxides
- Sulfur Oxides
- Carbon Monoxide
- Air Toxics; and
- Odour.

Other areas NEC considers to be important to address in the revised proposal are:

1. Demonstration that the HZI grate combustion technology chosen is consistent with best practice.
2. Justification for the decision not include an up-front Materials Recovery Facility for MSW. NEC will document that this decision has been made based on the fact that local governments in Western Australia are moving to adopt a 3 bin system that greatly improves the separation of wastes at source and largely removes the need for the MRF to deal with municipal solid waste. In the case of feedstocks derived from C&I or C&D waste, the updated facility will continue to accept such material where it is the high calorific value residual arising from processing such material through an off-site MRF. The Rockingham facility will still include an on-site MRF to process C&I and C&D waste to separate recyclables such as glass and metals and ensure that unsuitable materials are removed from the waste stream. The high calorific value residuals from the on-site C&I/C&D MRF will then be utilised as feedstock for the incineration process.

NEC has recently lodged a tender in conjunction with the HZI with the Eastern Metropolitan Regional Council for disposing of the Municipal Waste at the East Rockingham Facility. In order to meet the terms of the Tender, it is likely that NEC/HZI will need to have the final approval for the facility in place by the end of the 3rd quarter 2017 or early in the fourth quarter. With this in mind NEC would like to work with the OEPA to develop an assessment process that can be completed in the shortest possible time. To this end NEC will commit to ensuring that it manages those parts of the timeline that are within its ability to control in a manner which achieves a professional outcome in the minimum possible time.