TNG Feedstock Review

TNG v IPC No. 2019/13009

28 May 2021

Mike Ritchie & Associates Pty Ltd trading as MRA Consulting Group (MRA)
ABN 13 143 273 812

Suite 409 Henry Lawson Building
19 Roseby Street, Drummoyne NSW 2047
AUSTRALIA

P +61 2 8541 6169
E info@mraconsulting.com.au

mraconsulting.com.au

Document

Author	Navnith Grewal, Matthew Hyatt
Checker	Ron Wainberg
Approver	Mike Ritchie

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iv. The feedstock provided to TNG is "like" the feedstock supplied to Ferrybridge.

v. The fact that the Bingo network recycles between 80-90% of the input tonnages means that the TNG facility can demonstrate the highest resource recovery outcomes of any and all proposed EfW facilities in Australia. The addition of MPC2, will further enhance recovery rates of recyclables.

vi. MRA confirms that the feedstock has a calorific value between 8,500-16,485 kJ/kg which meets the HZI combustion requirements.

Note:

MRA *has reviewed the recently updated version of the NSW EPA's Draft Policy Statement "NSW Energy from Waste" which has published for public consultation. MRA confirms that there are no matters which would impact on MRA's report or the conclusions drawn herein.*

1 Introduction

MRA Consulting Group (MRA) has been engaged by The Next Generation Pty Ltd (TNG) via Mills Oakley (MO) to prepare a report to assess potential feedstocks for the amended design of the proposed Eastern Creek Energy from Waste (EfW) Facility (TNG).

This involves an updated analysis of the waste composition and feedstock proposed for TNG:

- Floc waste removed.

MRA has relied on the following information to prepare this analysis:

- NSW Energy from Waste Policy Statement (2015);
- Project Definition Brief provided by Ramboll;
- Annual input and output tonnage information of the Bingo processing facility network and MPC1 provided by Bingo;
- Letter of support from Bingo for supply of 100,000 tonnes of mixed C&I waste;
- Letter of support from Sydney Waste Services (SWS) for supply of 40,000 tonnes of mixed C&I waste;
- An audit of the mixed C&I waste stream in the Sydney Metropolitan area published by the NSW EPA in 2005;
- MRA's characterisation of the residual waste stream at Bingo's Auburn facility; and
- An audit of the residual waste from the Genesis Materials Processing Centre at Eastern Creek in 2017.

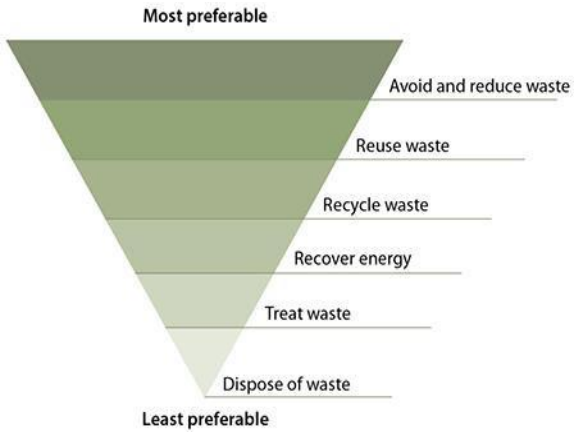
2 Policy Setting

The NSW Energy from Waste Policy Statement (the Statement), published in January of 2015[1], provides a policy framework for the recovery of energy from waste in NSW. By it, the NSW Environment Protection Authority (EPA) recognises the role of energy recovery facilities in diverting waste from landfill, maximising the efficient and sustainable use of resources, where re-use or recycling is not feasible, and offsetting the use of non-renewable energy sources. Likewise, the potential detriment of energy recovery facilities to human health and air quality and to the re-use and recycling of resources is also recognised in the Statement. In line with these considerations, the Statement establishes technical, thermal efficiency and resource recovery criteria for energy recovery in NSW.

MRA Consulting Group (MRA) has reviewed the proposed facility's compliance, together with TNG's proposed feedstocks, with the Resource Recovery Criteria of the NSW Energy from Waste (EfW) Policy Statement (presented in Appendix B). This report summarises the review's findings and outlines its key assumptions.

The Resource Recovery Criteria are guided by the Waste Avoidance and Resource Recovery Act 2001 (NSW). The Act establishes a hierarchy of waste management outcomes (see Figure 1). It also aims to ensure that waste management in NSW is guided by the resource recovery priorities established by the waste hierarchy.

Figure 1: NSW EPA waste hierarchy



Importantly, the waste hierarchy also acknowledges that the most preferable outcomes are at times financially or economically unfeasible. For example, the cost of an activity, be it to individuals, government or business, may far exceed the return or benefit, and thus act as a major disincentive for carrying out the activity.

Recycling, re-use, avoidance and reduction are all preferable to energy recovery under the principles of the waste hierarchy. However, while activities to this effect are carried out in NSW, there remains waste that is not feasible for re-use or recycling. This may be due to the material properties of certain wastes, difficulties in establishing a viable business model for recycling, or many other factors. Within the framework of the waste hierarchy, the Resource Recovery Criteria identifies a specific segment of waste that cannot be further re-used and recycled, this being residual from "processing facilities" (i.e. facilities undertaking recycling or reuse). The Criteria designates such waste, which has undergone a resource recovery process, and yet could not be feasibly recovered through that process, as 'eligible' for energy recovery.

Energy recovery delivers a better resource recovery outcome than waste treatment and disposal and this is reflected in the principles of the waste hierarchy. The Resource Recovery Criteria apply a suitably limited and targeted scope to waste eligible for energy recovery. As a result, the Statement upholds key resource recovery priorities regarding the management of waste in NSW.

There are two key factors which need to be emphasised:

- The Bingo network of C&D resource recovery facilities achieve a combined recycling rate of 80-90%. This means that the waste received by TNG is truly residual waste. (This compares to 5% recycling rates quoted in the Cleanaway EfW EIS).

[1] http://www.epa.nsw.gov.au/wastestrategy/energy-from-waste.htm

- TNG has secured feedstock agreements with all of the tonnes proposed to be received.

These two criteria set the TNG proposal apart from all other EfW proposals in Australia by providing a great degree of certainty around the receival of waste and the fact that it is fully depleted of recyclable material.

3 Potential feedstock tonnages available in the Metropolitan Levy Area market

MRA conducted modelling to estimate the amount of waste generated in the NSW Metropolitan Levy Area (MLA) in 2019 that was ultimately disposed of in landfill, either directly or as a residual from a processing facility. Waste landfilled within the MLA was used as the basis for the modelling as all waste generated or landfilled within the MLA is required to pay the Metropolitan Waste Levy which was implemented to increase resource recovery outcomes in the region. A map showing the boundaries of the MLA is presented in Attachment 1.

MRA modelled the potential feedstock tonnages based on the Waste Avoidance and Resource Recovery Strategy Progress Report 2017-18 data[2], which details the quantity of MSW, C&I and C&D waste that is generated, recycled and landfilled in the MLA. The waste generation and disposal data for MSW, C&I and C&D in the MLA for 2017-18 is summarised in Table 1 below. MRA notes that the data summarised in Table 1 reflects the waste generation and disposal flows before the introduction of the Queensland Waste Levy. Both changes have likely led to an increase in the landfilling of such waste, either directly or as a residual from a processing facility in the MLA.

Table 1: MLA waste generation and disposal data

Waste generated (tonnes per annum)				
Levy Area	**MSW**	**C&I**	**C&D**	**Total**
MLA	2,959,000	3,007,000	11,524,000	**17,490,000**
Waste sent to landfill (tonnes per annum)				
Levy Area	**MSW**	**C&I**	**C&D**	**Total**
MLA	1,741,000	1,538,000	2,225,000	**5,504,000**

MRA notes that whilst **5.5 m tonnes** of waste is sent to landfill in the MLA, TNG's access to this material will depend on multiple commercial factors and, as such, TNG could secure its feedstock via a combination of existing eligible tonnes within the MLA market as presented below.

This analysis demonstrates that there is sufficient potential feedstock available for the MSW, C&I and C&D waste streams in the MLA. To estimate the quantity of eligible feedstock as prescribed in the NSW EfW Policy Statement the source separation, collection and processing information for all waste in the MLA must be understood.

MRA has detailed one potential combination of waste feedstocks in the next section which considers these factors and their impact on the calculation of the volume of eligible waste which could be contracted by TNG to supply the proposed EfW facility.

[2] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/recycling/19p1690-warr-strategy-progress-report-2017-18.pdf?la=en&hash=89CD40E994CC383F6A1E23512714FD3FF5C69C6C

4 TNG Feedstock Analysis

MRA notes that only 552,500 tonnes per annum are required to operate the facility and that TNG has contracted supply of three sources of residual C&D and C&I feedstock (eligible under the NSW EfW Policy) from a number of suppliers as set out in Table 2.

These three sources of eligible feedstock have been assessed according to the following resource recovery criteria detailed within the NSW Energy from Waste Policy 2015 (Appendix B):

- Only waste that is non-hazardous is eligible;
- The percentage of C&D residual feedstock which is eligible for energy recovery i.e. up to 25% by weight of the waste stream received at a processing facility; and
- The percentage of C&I residual feedstock which is eligible for energy recovery i.e. up to 50% by weight of the waste stream received at a processing facility.

Table 2: Potential and commercially available feedstock

Source	Description	Contracted and Eligible (under NSW EfW Policy (tpa)	Contracted Tonnes in Final TNG Mix (tpa)
Stream 1 – Bingo Network Processing Facilities*	Residual waste from processing of mixed C&D waste processed at Bingo C&D facilities other than MPC1 and MPC2	203,507	203,507
Stream 2 - Bingo MPC1 (and in future MPC2)	Residual waste from processing of mixed C&D waste processed at MPC1 (and in future MPC2)	492,198	279,693
Stream 3 - Mixed C&I Waste	Residual waste from processing of mixed C&I waste processed at MPC1 (and in future MPC2)	69,300	69,300
TNG Fuel Mix			**552,000**

Notes:

* - Due to confidentiality concerns the Bingo processing facilities referred to in the table above have not been disclosed by Bingo, beyond that the sites are bona fide processing facilities.

4.1 Stream 1 - Eligible feedstock within the Bingo C&D network

TNG's first supply of feedstock is C&D residual waste from Bingo's existing network of C&D processing facilities.

The residual waste from the C&D processing facilities (detailed in the Bingo Letter "The Next Generation (NSW) Pty Ltd v Independent Planning Commission - Land and Environment, dated 13 August 2019" - See Attachment 2) is currently being landfilled and is contracted to TNG (i.e. supply is guaranteed).

The amount of eligible C&D residual feedstock within the Bingo network suitable for energy recovery in the proposed TNG facility is restricted by the EfW policy criteria:

a) The tonnes received at the processing facility;

b) Under the NSW Energy from Waste Policy Statement 2015, up to 25% by weight of the mixed C&D waste received at a C&D processing facility is allowed to be diverted for energy recovery; and

c) Of the eligible feedstock, the percentage which is non-hazardous.

Table 3 below outlines the amount of C&D waste received by the Bingo C&D processing facilities and the amount of eligible C&D residual feedstock available which has been classified as non-hazardous from each C&D processing facility.

Table 3: Eligible feedstock from Bingo C&D network

Stream 1	A	B	C	D	E	F	Total
a) C&D waste received at processing facility (tpa)	250,011	236,324	51,095	108,915	116,670	92,869	855,884
b) Eligible C&D residual feedstock (25% of C&D waste received – tpa) #	62,503	59,081	12,774	27,229	29,168	23,217	213,972
c) Eligible feedstock after removal of hazardous waste (4.89% of eligible C&D residual feedstock * - tpa)	59,446	56,192	12,149	25,897	27,741	22,082	203,507
Tonnes committed and contracted to TNG Facility							**203,507**

Notes:

 # - The eligible feedstock from each of the processing facilities is limited by the 25% cap of incoming waste detailed in the NSW Energy from Waste Policy for C&D waste.

* - Based on the audit results for Genesis MPC (which since the Bingo acquisition of Dial a Dump Industries has become the hazardous waste removal standard for all Bingo C&D waste), approximately 4.89% of the C&D processing residual waste is hazardous waste and therefore not eligible (Attachment 4). This waste is currently landfilled.

4.2 Stream 2 - Eligible feedstock within the Bingo MPC1 (and in the future MPC2)

TNG's second supply of feedstock is C&D residual waste from Bingo's MPC1 (and in the future MPC2) processing facilities.

The residual waste from the MPC1 processing facility (detailed in the Bingo Letter "The Next Generation (NSW) Pty Ltd v Independent Planning Commission - Land and Environment, dated 13 August 2019" - See Attachment 2) is currently being landfilled and is contracted to TNG (i.e. supply is guaranteed).

The amount of eligible C&D residual feedstock within the Bingo MPC1 (and in the future MPC2 facilities) suitable for energy recovery in the proposed TNG facility is restricted by the EfW policy criteria:

a) The tonnes received at the processing facility;

b) Under the NSW Energy from Waste Policy Statement 2015, up to 25% by weight of the mixed C&D waste received at a C&D processing facility is allowed to be diverted for energy recovery; and

c) Of the eligible feedstock, the percentage which is non-hazardous.

Table 4 below outlines the amount of C&D waste received by the Bingo MPC1 (and in the future MPC2) and the amount of eligible C&D residual feedstock available which has been classified as non-hazardous.

Table 4: Eligible feedstock from Bingo MPC1 (and in the future MPC2)

Stream 2	MPC1 (and in the future MPC2)	Bingo C&D residuals diverted from QLD	Total
a) C&D waste received at processing facility (tpa)	670,017	350,000	1,020,017
b) Eligible C&D residual feedstock (25% of C&D waste received – tpa) #	167,504	350,000	517,504
c) Eligible feedstock after removal of hazardous waste (4.89% of eligible C&D residual feedstock * - tpa)	159,313	332,885	492,198
d) Required feedstock for TNG	159,313	120,380	279,693
Tonnes committed and contracted to TNG Facility			**279,693**
Notes: **# -** The eligible feedstock from each of the processing facilities is limited by the 25% cap of incoming waste detailed in			

the NSW Energy from Waste Policy for C&D waste.

* - Based on the audit results for Genesis MPC (which since the Bingo acquisition of Dial a Dump Industries has become the hazardous waste removal standard for all Bingo C&D waste), approximately 4.89% of the C&D processing residual waste is hazardous waste and therefore not eligible (Attachment 4). This waste is currently landfilled.

4.3 Stream 3 - Eligible feedstock from Mixed Inert C&I waste

Bingo has provided a letter indicating that should the proposed TNG EfW facility receive approval, that Bingo would supply 100,000 tonnes of mixed C&I waste as a potential waste fuel component depending on commercial negotiations (Attachment 5).

Sydney Waste Services (SWS) has provided a letter indicating that should the proposed TNG EfW facility receive approval, that SWS would be committed in supplying 40,000 tonnes of mixed C&I waste depending on commercial negotiations (Attachment 6).

The amount of eligible mixed inert C&I feedstock collected by Bingo and processed at MPC1 (and in the future MPC2) for energy recovery in the proposed TNG EfW facility is restricted by the EfW Policy:

a) The tonnes received at the processing facility;

b) Under the NSW Energy from Waste Policy Statement 2015 up to 50% by weight of the mixed C&I waste at a C&I processing facility is allowed for energy recovery (as the mixed C&I waste is received from businesses where the current separation collection systems for recyclables has not been quantified); and

c) Of the eligible feedstock, the percentage which is non-hazardous.

Table 5 below outlines the amount of mixed inert C&I waste received by Bingo MPC1.

Table 5: Eligible waste from mixed inert C&I waste streams

Stream 3	Bingo	SWS	Total
a) C&I waste received at processing facility (tpa)	100,000	40,000	140,000
b) Eligible C&I residual feedstock (50% of C&I waste received – tpa) #	50,000	20,000	70,000
c) Eligible feedstock after removal of hazardous waste (1% of eligible C&I feedstock * - tpa)	49,500	19,800	69,300
Tonnes committed and contracted to TNG Facility			**69,300**

Notes:

- The eligible feedstock from each of the processing facilities is limited by the 50% cap of incoming waste detailed in the NSW Energy from Waste Policy for C&I waste.

* - Based on the NSW EPA audit of mixed C&I waste (2005), 1% of the mixed waste C&I waste stream is hazardous waste (Appendix C).

5 Final Fuel Mix

There are many potential fuel mixes which can be drawn from the tonnes that are both available in the market and "eligible" under the NSW EfW Policy (have been through a Processing Facility and in accordance with Table 1 eligibility criteria).

The criteria adopted in determining the preferred final fuel mix are:

- The tonnes are available and are contracted to TNG. All feedstock tonnes listed in this report are under contract by TNG project partners such as Bingo and Sydney Waste Services);
- The tonnes are "eligible" under the NSW EfW Policy (and the recently released 30 March 2021 draft consultation paper);
- The mix meets the reference facility requirements of the EfW policy by "*demonstrating through reference to fully operational plants (Ferrybridge) using the same technologies and treating like waste streams in other jurisdictions"*; and
- The mix meets the fuel mix requirements of the HZI technology as set out in the Combustion Diagram (Appendix D) to achieve the throughput tonnages and Calorific Value (CV) specifications.

Table 6 provides the Calorific Value associated with each of these selected streams.

Table 6: Selected Fuel Mix

Waste Stream	% Composition	Tonnes (based on Input)	CVraw (kJ/kg)
Stream 1 - Bingo C&D Network	37%	203,507	9,088
Stream 2 - Bingo C&D Genesis (MPC1 and future MPC2)	54%	279,693	13,778
Stream 3 – Inert C&I (BINGO & SWS)	9%	69,300	10,056
Total Feedstock Mix	**100%**	**552,500**	**11,584**

Note: There are two separate Calorific Values for the Bingo C+D streams. This is a function of the operating efficiency of the different sorting technologies currently employed at different Bingo sites. Older sites with older sorting systems are less efficient and generate a slightly lower CV stream. That is they are less efficient at recovering high CV materials.

MPC1 (and in future MPC2) uses more modern technology and has a higher recovery efficiency. To that extent it recovers proportionally more aggregate, soil and brick, and therefore generates a higher CV eligible residual stream. This difference is captured in the "CVraw (kj/kg)" column in Table 6 above.

6 Security of Feedstock Supply

The feedstock supply set out in Table 6 are all eligible (under the NSW EfW Policy) and contracted to TNG. Bingo provides exceptional commercial security in terms of feedstock supply to TNG and ensures that the tonnes supplied meet the requirements of the NSW EfW Policy both now and into the future.

The fact that the Bingo network recycles between 80-90% of the input tonnages means that the TNG facility can demonstrate the highest resource recovery outcomes of any and all proposed EfW facilities in Australia.

7 Reference Facility Comparison

Based on the updated feedstock analysis presented in the MRA Feedstock Report, MRA has updated the eligible feedstock composition and the comparison with the Ferrybridge Multifuel 1 reference facility.

Table 7 below outlines the TNG feedstock composition.

Table 8 compares the TNG feedstock composition with that of Ferrybridge.

Table 7: Feedstock material type composition of TNG (weighted averages)

	Bingo C&D Network		Bingo MPC1		Inert C&I		TNG Facility	
Category	Composition	Tonnes	Composition	Tonnes	Composition	Tonnes	Sum Tonnes	Wgt Av
Organics	12.9%	26,322	75.1%	210,162	34.8%	24,144	260,628	47.2%
Paper/Cardboard	30.5%	62,149	3.9%	11,025	15.8%	10,924	84,098	15.2%
Plastic	14.6%	29,734	7.8%	21,695	13.0%	8,976	60,405	10.9%
Metal (ferrous and non-ferrous)	1.1%	2,193	2.0%	5,542	2.6%	1,809	9,545	1.7%
Electronic Waste		-		-		-	-	0.0%
Hazardous		-		-		-	-	0.0%
Glass	0.0%	-	0.1%	296	1.5%	1,044	1,340	0.2%
Other (earth and building materials)	40.8%	83,109	11.1%	30,972	32.3%	22,404	136,485	24.7%
Total	**100.0%**	**203,507**	**100.0%**	**279,693**	**100.0%**	**69,300**	**552,500**	**100.0%**

Table 8: Feedstock comparison "Like Waste Stream"

Feedstock Material Type	Ferrybridge Multifuel #1	Proposed TNG Facility
Organics	52.5%	47.2%
Plastic	18.0%	10.9%
Paper/cardboard	14.2%	15.2%
Other (earth/masonry)	6.8%	24.7%
Metals	3.7%	1.7%
Glass	3.7%	0.2%
E-Waste	1.0%	0.0%
Hazardous waste	0.1%	0.0%
Chemical waste	0.0%	0.0%
Clinical waste	0.0%	0.0%
Tyres	0.0%	0.0%
Liquid waste	0.0%	0.0%
Salts and chemical residues	0.0%	0.0%
Slaughterhouse waste	0.0%	0.0%
Cadavers	0.0%	0.0%
Explosives	0.0%	0.0%
Unshredded bulky goods	0.0%	0.0%
Bone meal	0.0%	0.0%
Radioactive waste	0.0%	0.0%
PFAS	0.0%	0.0%
Contaminated soil	0.0%	0.0%
Oil	0.0%	0.0%
Cytotoxic waste	0.0%	0.0%
Asbestos waste	0.0%	0.0%
Shredder floc	0.0%	0.0%
Paint	0.0%	0.0%
Total	**100%**	**100%**

Notes:

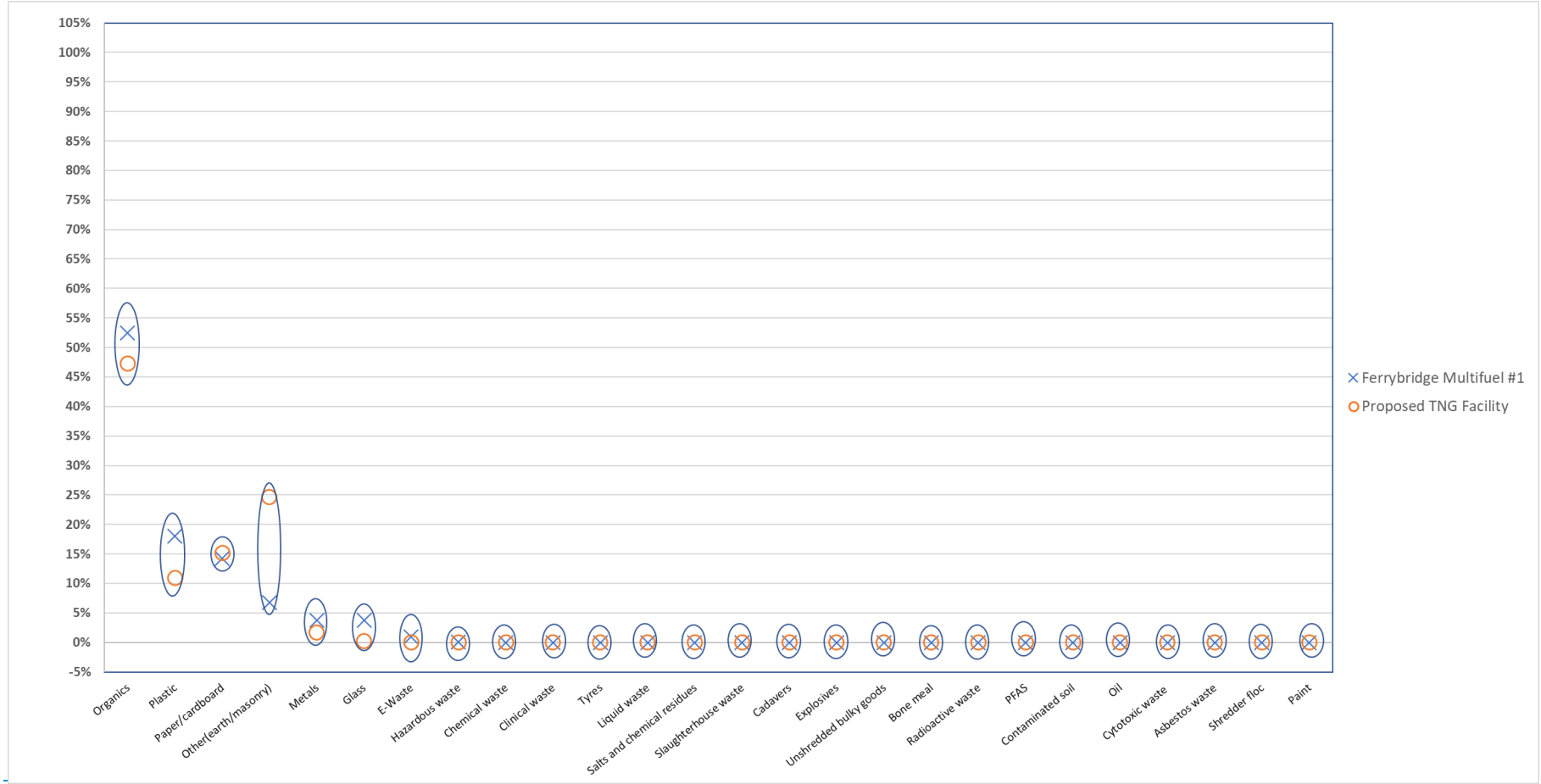
- The feedstock material composition values for the Ferrybridge Multifuel 1 facility is sourced from "Attachment 1 - Table 1: Composition in weight percent for February 2018" – Ramboll Memo reference TNGWTE-141-036- Refence Facility Ferrybridge (2018.05.09).

* - The feedstock material composition values for the proposed TNG Facility is calculated using the weighted average of each material category for the three different feedstock components being the Genesis MPC C&D residual feedstock, Bingo network processing facilities C&D residual feedstock and the mixed C&I feedstock.

7.1 “Like Waste Streams” Comparison

Figure 2 shows that the waste streams from TNG and Ferrybridge are “like” or similar in character at the material type level (paper/cardboard, metals, organics, etc).

Figure 2: Comparison of Ferrybridge vs TNG feedstock compositions by material type



8 Conclusions

vii. The NSW MLA currently landfills 5.5 million tpa.

viii. The feedstock to TNG complies with the Resource Recovery Criteria set out in Table 1 of the NSW EfW Policy.

ix. All of the 552,500 tonnes of feedstock are contracted to TNG providing security of supply.

x. The feedstock provided to TNG is "like" the feedstock supplied to Ferrybridge.

xi. The fact that the Bingo network recycles between 80-90% of the input tonnages means that the TNG facility can demonstrate the highest resource recovery outcomes of any and all proposed EfW facilities in Australia. The addition of MPC2, will further enhance recovery rates of recyclables.

xii. MRA confirms that the feedstock has a calorific value between 8,500-16,485 kJ/kg which meets the HZI combustion requirements (Appendix D).

Note:

MRA *has reviewed the recently updated version of the NSW EPA's Draft Policy Statement "NSW Energy from Waste" which has published for public consultation. MRA confirms that there are no matters which would impact on MRA's report or the conclusions drawn herein.*

Appendix A Feedstock Flow Overview

Feedstock Stream	Facility	Waste received at processing facility (tpa)	Policy Limit % on waste received at processing facility	EfW Policy Limit	Non-compliant % removed	Post removal of hazardous waste (tpa)	Final TNG Fuel Mix	Included in Final Fuel Mix	Processing Facility
Stream 1	A (Bingo C&D Facility)	250,011	25%	62,503	4.89%	59,446	59,446	Yes	Bingo C&D Facility
	B (Bingo C&D Facility)	236,324	25%	59,081	4.89%	56,192	56,192	Yes	Bingo C&D Facility
	C (Bingo C&D Facility)	51,095	25%	12,774	4.89%	12,149	12,149	Yes	Bingo C&D Facility
	D (Bingo C&D Facility)	108,915	25%	27,229	4.89%	25,897	25,897	Yes	Bingo C&D Facility
	E (Bingo C&D Facility)	116,670	25%	29,168	4.89%	27,741	27,741	Yes	Bingo C&D Facility
	F (Bingo C&D Facility)	92,869	25%	23,217	4.89%	22,082	22,082	Yes	Bingo C&D Facility
	Subtotal Bingo Network C&D	**855,884**	**25%**	**213,972**	**4.89%**	**203,507**	**203,507**	**Yes**	**Bingo C&D Facility**
Stream 2	MPC 1	670,017	25%	167,504	4.89%	159,313	159,313	Yes	MPC1/ in future MPC2
	MPC1 - Bingo C&D residual previously sent to QLD (and in future MPC2)	350,000	100%	350,000	4.89%	332,885	120,380	Yes (partial)	MPC1/ in future MPC2
	Subtotal MPC1/MPC2 C&D	**1,020,017**	**25%**	**517,504**	**n/a**	**492,198**	**279,693**	**Yes (partial)**	**MPC1/ in future MPC2**
Stream 3	Bingo C&I waste (MPC 1 and in future MPC 2)	100,000	50%	50,000	1.00%	49,500	49,500	Yes	MPC1/ in future MPC2
	SWS C&I waste (SWS Facility/ MPC1 and in future MPC 2)	40,000	50%	20,000	1.00%	19,800	19,800	Yes	MPC1/ in future MPC2
	Subtotal C&I	**140,000**	**50%**	**70,000**	**n/a**	**69,300**	**69,300**	**Yes**	**MPC1/ in future MPC2**
TOTAL	**Grant Total**	**2,015,901**	**n/a**	**801,476**	**n/a**	**765,005**	**552,500**	**552,500**	**n/a**

Appendix B NSW EfW Policy Statement

Figure 3: NSW EfW Policy Statement - Resource Recovery Criteria

Resource recovery criteria

The EPA considers energy recovery to be a complementary waste management option for the residual waste produced from material recovery processes or source-separated collection systems.

The policy statement's objectives in setting resource recovery criteria are to:

- promote the source separation of waste where technically and economically achievable
- drive the use of best practice material recovery processes
- ensure only the residual from bona-fide resource recovery operations are eligible for use as a feedstock for an energy recovery facility.

Energy recovery facilities may only receive feedstock from waste processing facilities or collection systems that meet the criteria outlined in Table 1.

Proponents wishing to use waste or waste-derived materials for energy recovery that are not defined in Table 1 must contact the EPA to discuss their proposal. The EPA will consider any such proposals on a case-by-case basis in accordance with the energy from waste considerations outlined in this policy statement and the principles set out in the POEO Act and WaRR Act.

Table 1: Resource recovery criteria for energy recovery facilities

Mixed wastes		
Waste stream	**Processing facility**	**% residual waste allowed for energy recovery**
Mixed municipal waste (MSW)	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and food and garden waste	No limit by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and garden waste	Up to 40% by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has a separate collection system for dry recyclables	Up to 25% by weight of the waste stream received at a processing facility

Mixed commercial and industrial waste (C&I)	Facility processing mixed C&I waste	Up to 50% by weight of the waste stream received at a processing facility
	Facility processing mixed C&I waste where a business has separate collection systems for all relevant waste streams	No limit by weight of the waste stream received at a processing facility
Mixed construction and demolition waste (C&D)	Facility processing mixed C&D waste	Up to 25% by weight of the waste stream received at a processing facility
Residuals from source-separated materials		
Source-separated recyclables from MSW	Facility processing source-separated recyclables from MSW	Up to 10% by weight of the waste stream received at a processing facility
Source-separated garden waste	Facility processing garden waste	Up to 5% by weight of the waste stream received at a processing facility
Source-separated food waste (or food and garden waste)	Facility processing source-separated food or source-separated food and garden waste	Up to 10% by weight of the waste stream received at a processing facility

Separated waste streams	
Waste stream	**Feedstock able to be used at an energy recovery facility**
Waste wood	Residual wood waste sourced directly from a waste generator e.g. manufacturing facility
Textiles	Residual textiles sourced directly from a waste generator
Waste tyres	End-of-life tyres
Biosolids	Used only in a process to produce a char for land application
Source-separated food and garden organics	Used only in a process to produce a char for land application

Notes

1. The EPA may give consideration to increases to the maximum allowable percentage of residuals from facilities receiving mixed municipal and commercial and industrial waste where a facility intends to use the biomass component from that process for energy recovery, rather than land application and the facility can demonstrate they are using best available technologies for material recovery of that stream.
2. Waste streams proposed for energy recovery should not contain contaminants such as batteries, light bulbs or other electrical or hazardous wastes.
3. Bio-char or char materials produced from facilities using mixed waste streams will not be able to be considered for land application as a soil amendment or improvement agent.
4. The C&I no limit category is likely to apply only to mixed waste collected from single generators of large volumes of waste (e.g. supermarkets) or precinct based businesses (e.g. shopping centers). Proponents will need to demonstrate that each entity generating waste has effective and operating collection systems for **all** waste streams they generate that have reuse or recycling opportunities (e.g. paper/cardboard collection; organic collection; and residual waste collection). Proponents wishing to use the C&I no limit category will need to contact the EPA to determine the eligibility of each entity.

Appendix C Mixed C&I Composition

Table 9: Mixed C&I Composition

Category	Composition by weight	Suitable Fuel
Paper	10.2%	Y
Wood	14.4%	Y
Plastic	12.9%	Y
Metal (ferrous and non-ferrous)	2.6%	N
Food organics	9.7%	Y
Electronic Waste	0.4%	N
Hazardous	1.0%	N
Glass	1.5%	N
Other (floc, fines, etc)	18.9%	N
Cardboard	5.5%	Y
Garden Organics	4.7%	Y
Rubber	0.6%	Y
Textiles	5.3%	Y
Masonry	12.3%	N
Total	**100%**	**63.3%**
Notes: The above composition is based on the mixed C&I composition detailed within the NSW EPA "Disposal-based audit – Commercial and industrial waste stream in the regulated areas of NSW, May 2015"[3].		

[3] https://www.epa.nsw.gov.au/publications/warrlocal/150209-disposal-based-audit-main-report

Appendix D TNG 552ktpa Combustion Diagram

Figure 4: HZI Combustion Diagram for 552ktpa facility