ATTACHMENT E – Environment Protection Authority – Greenhouse Gas Assessment

This Attachment should be read in conjunction with the previous and subsequent attachments provided in this response.

Qualification in relation to feedstock

The GHG emissions results range from 52,023 to 163,353 CO_2-e(tpa), ie by a factor of three, which demonstrates the critical dependence of GG emissions estimation on the input values, information and assumptions used for each determination. Consequently, variations in waste streams (material sources and compositions) will result in fuel mixes different to the 'average' design fuel mix, and consequently different GG emission profiles.

Therefore, the EPA advises that the actual project GG emissions will depend on the amount and nature of the fuel processed at the facility.

The EPA has reviewed the project Greenhouse Gas Assessment (GGA) titled *Energy From Waste Facility - Air Quality and Greenhouse Gas Assessment, The Next Generation* (PEL, 20 November 2017).

Summary

The GGA generally adequately assesses facility GG emissions in accordance with the requirements of the National Greenhouse and Energy Reporting (NGER) measurement determination.

Most of the issues identified in a prior revision of GGA (Rev 6, October 2016) previously and most recently reviewed by the EPA have been satisfactorily resolved, though there remains a lack of clarity associated with the derivation of some of the estimated values.

Overall, the GGA demonstrates the EfW facility would have a net positive GG impact with an emissions intensity lower than that derived from the current NSW electricity grid.

Details of the issues identified from the EPA's review of the GGA are provided below.

1. GG emission estimation methodologies and strategy.

    a. GG emissions estimation from waste incineration (Scope 1 emissions).

The GGA has been revised to estimate GG emissions under average, minimum and maximum processed waste and percent carbon content scenarios. The amount of processed waste assessed was between 405,000 and 675,000 tpa, while the percent carbon content ranged from 23.45% (the minimum carbon content in a single waste stream – floc waste) to 44.18% (the maximum carbon content in MRF residual waste).

The GHG emissions results range from 52,023 to 163,353 CO_2-e(tpa), ie by a factor of three, which demonstrates the critical dependence of GG emissions estimation on the input values, information and assumptions used for each determination. Consequently, variations in waste streams (material sources and compositions) will result in fuel mixes different to the 'average' design fuel mix, and consequently different GG emission profiles.

Therefore, the EPA advises DPE that actual project GG emissions will depend on the amount and nature of the fuel processed at the facility.

b. GG emissions estimation from the facility substituting grid electricity.

The estimation of grid electricity substituted with facility generated electricity is based on the facility design having a thermal input of 235.96 MW (117.98 MW for each combustion line) and an assumed net average annual electrical efficiency of 29.1%. The facility has an auxiliary load of 7.3MW and is designed to export 68.7 MWe to the main electricity grid, though it is unclear if this value is a maximum, average or other value. In addition, the GGA does not refer to detailed facility design information to justify the values used to estimate emissions substituted by energy/emissions generated from the facility.

The estimation also assumes the facility will operate for 8,000 hours per year, and uses a Scope 2 emission factor for grid electricity in NSW of 0.84 (kg CO_2-e/kWh) based on the August 2016 National Greenhouse Accounts Factors[1]. A sensitivity analysis is included in the GGA to account for the anticipated reduction for substitution of grid electricity for the facility over time through introduction of less carbon intensive sources of energy.

The EPA advises DPE that additional information is required to justify the values used to estimate emissions substituted by energy/emissions generated from the facility. Nevertheless, the facility will likely result in a significant amount of grid electricity substituted.

c. GHG emissions estimation for emissions diverted from landfilling.

i. The GGA assumes combustion of landfill emissions would not occur.

The GGA has not been revised to address the potential for combustion of methane generated at landfill, rather it is stated that this would not form a part of future operations at the site and therefore has not been considered.

As the expected life of the landfill project is between 45 and 65 years, and as landfill GG emission capture and mitigation is becoming established as best practice, it is unclear why this is discounted from becoming a part of future operations at the site.

Therefore, the EPA advises DPE that the estimated emissions diverted from landfilling may not be representative of emissions from modern landfills that implement landfill gas capture and treatment.

ii. The quantity of degradable organic carbon has significantly increased in the GGA.

The GGA has been amended to include emissions estimated from disposal of waste to landfill based on the NGER calculator 2015-2016.

As the input data used in the calculator is not provided, it is not possible to validate or verify the data used or estimates gained.

The EPA notes that the values used in the estimation of GG emissions diverted from landfilling are not clearly presented and justified as appropriate for use in the GGA.

2. Estimated net GG emissions.

The GGA has been amended to include revised net GG emissions over a period of 25 years, estimated as 15.3Mt CO_2-e.

[1] National Greenhouse Accounts Factors, Australian National Greenhouse Accounts (DEE, August 2016).

The EPA notes that the GGA does not justify the changed assumptions used to estimate net GHG emissions from the facility.

3. Additional information is required to verify the estimated emissions intensity for the proposal.

The GGA estimates an emissions intensity for the proposed facility of 0.17 tonnes CO_2-e/MWh generated. However, the GGA does not provide sufficient information to enable this value to be verified, or to clarify and justify the appropriateness of this value.

The EPA advises DPE that the GGA does not provide sufficient information to justify and enable verification of the estimated emissions intensity of the facility.

Conclusion

With consideration to the matters discussed above, the EPA advises DPE that the proposed EfW facility will have a net positive GG impact with an emissions intensity lower than that derived from the current NSW electricity grid. Further information could be obtained if needed, to confirm assertions made in the GGA.