



Our reference: DOC17/275495

Mr Chris Ritchie  
Director  
Industry Assessments  
Department of Planning & Environment  
GPO Box 39  
SYDNEY NSW 2001

**EMAIL & STANDARD POST**

Dear Mr Ritchie

I refer to the amended Environmental Impact Statement ("amended EIS") submitted by Urbis Pty Ltd in relation to a proposed energy from waste facility at Eastern Creek (SSD 6236).

The EPA reviewed the amended EIS and provided extensive comments to the Department of Planning & Environment ("DPE") on 24 March 2017. Those comments mainly related to air quality impacts, human health impacts and alignment with the NSW EPA's Energy from Waste Policy.

The EPA has also undertaken a review of the Greenhouse Gas Assessment contained within the report titled "Air Quality and Greenhouse Gas Assessment" dated 31 October 2016 and prepared by Pacific Environment Limited ("GGA").

The EPA advises that, while the approach used in the GGA to assess greenhouse gas ("GHG") emissions is generally appropriate and based on the relevant guidelines, the GGA lacks information and justification on the input values and assumptions used. Consequently, the significance of GHG benefits from the facility are unclear.

The EPA's comments in relation to the GGA are enclosed as Attachment A.

If you have any questions in relation to this matter, please contact Deanne Pitts on (02) 9995 5752.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Steve Beaman'.

**STEVE BEAMAN**  
**Executive Director Waste and Resource Recovery**  
**Environment Protection Authority**

15.5.2017

Enclosed. Attachment A – NSW EPA – Greenhouse Gas Assessment

## NSW Environment Protection Authority

### Review of the Greenhouse Gas Assessment

#### Summary

The EPA has reviewed the GGA (PEL, 31 October 2016) for the proposed Energy from Waste Facility (the facility) at Eastern Creek (the site). The GGA<sup>1</sup> consists of an updated assessment to that previously prepared by PEL in March 2015<sup>2</sup>.

Greenhouse gas (GHG) estimations are critically dependant on the input values and assumption used. The EPA notes the GGA lacks justification to demonstrate this input information is robust in all cases.

Currently the GGA appears to significantly overestimate emissions from landfills which results in a doubling of net GHG emissions prevented compared to estimate of the previous GGA.

The EPA notes that for the GHG estimates to be realised in practice, the composition and, in particular, the carbon content of the waste streams and fuel mix as a whole, will need to be consistent or exceed those used in the calculations to estimate facility GHG emissions. For example, fuel mixtures that contain a lower carbon content to that used in the GGA will result in reduced calorific value of the feed material and consequently reduced energy output per tonne of waste feed material. This will in turn lessen the net benefits on GHG emissions resulting from the facility.

The EPA notes the issues identified in the GGA bring into question the significance of the facility's positive GHG impacts.

#### ISSUES OF CONCERN

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, 31 October 2016). Details of the issues identified by the EPA are provided below.

##### **1. GHG emission estimation methodologies and strategy.**

The EPA notes the approach used to estimate GHG emissions due to Scope 1 and Scope 2 emissions is generally appropriate and is based on emission factors and equations provided in the NGER Technical Guidelines.

##### **a. GHG emissions estimation from waste incineration (Scope 1 emissions).**

The estimation of emissions directly generated from waste incineration at the facility uses Method 1 under Part 5.5 – Waste Incineration of the NGER Technical Guidelines.

The EPA notes, to incorporate and characterise the design fuel, every waste product was analysed and its chemical composition redefined based on a database of comparable products. The chemical analysis and calorific value data for each waste stream applied in the assessment is provided in the GGA Appendix D.1<sup>3</sup>. The EPA has not reviewed or verified the material source and composition data for the proposed design waste streams, presented as the revised design fuel mix<sup>4</sup>.

The average waste carbon content (31.44%) and percent carbon that is of fossil origin (33.14%) were estimated from the chemical analysis of each waste stream from updated compositional data in Appendix D.1<sup>5</sup>. A default oxidation factor value (0.98) was used due to this value being unknown.

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<sup>1</sup> Energy from Waste Facility – Air Quality and Greenhouse Gas Assessment – The Next Generation (PEL, 31 October 2016).

<sup>2</sup> Energy from Waste Facility – Air Quality and Greenhouse Gas Assessment – The Next Generation (PEL, 26 March 2015).

<sup>3</sup> GGA Appendix D1: Ramboll Memo - Design Fuel Mix - 24 October 2016.

<sup>4</sup> GGA Appendix D1: Ramboll Memo - Design Fuel Mix - 24 October 2016. Updated Technical Design Information (UTDI, Nov 2015).

<sup>5</sup> GGA Appendix D1: Ramboll Memo - Design Fuel Mix - 24 October 2016.

The EPA notes the emissions estimation is critically dependant on the input values, information and assumptions used for each determination. For example, the current GGA reports GHG emissions from waste incineration (505,069 tpa CO<sub>2</sub>-e) 20% lower than the previous GGA (629,784 tpa CO<sub>2</sub>-e). The difference in GHG emissions results from a minor change only to the design waste stream/fuel mix: the inclusion of waste gyprock to the chute residual waste (CRW) and construction and demolition (C&D) waste streams. The EPA notes this clearly demonstrates how variations in waste streams (material sources and compositions) can result in fuel mixes different (to the design fuel mix), and consequently different GHG emission profiles. Consequently, the estimated value for GHG emissions based on the given design fuel mix may not be the most conservative value in practice.

The EPA notes a minor error in Table 10-1. Note 1 should refer to Appendix D, not Appendix G (as per the previous GGA).

**The EPA advises:**

- i. the assessment of emissions from waste incineration has been undertaken based on a theoretical design fuel composed of numerous different waste streams with different but specific carbon and chemical makeup; and**
- ii. the resulting emissions estimation may not be conservative if the fuel contains a lower carbon content and/or high content of fossil derived carbon than the assessed design fuel.**

***b. GHG emissions estimation from the facility substituting grid electricity.***

The estimation of emissions resulting from the substitution of grid electricity with facility generated electricity uses Method 1 under Chapter 7 of the NGER Technical Guidelines.

The EPA notes the emissions estimation is based on the facility design having a thermal input of 471.9 MW (117.98 MW for each combustion line) and an assumed net average annual electrical efficiency of 29.1%. The facility is designed to export 137.3 MWe to the main electricity grid. However, the GGA does not refer to detailed facility design information to justify the use of these parameters 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 0.86 (kg CO<sub>2</sub>-e/kWh). The EPA notes the latest NSW emission factor estimate from the most recent (August 2016) National Greenhouse Accounts Factors<sup>6</sup> is 0.84 (the same as at August 2015). Use of this reduced emission factor results in a lowering of the estimate GHG emissions replaced by the facility (by about 2.5%). In addition, it is anticipated that the emission factor will continue to decrease through introduction of less carbon intensive sources of energy.

**The EPA advises:**

- i. the estimation of grid emissions substituted by the facility is highly dependent on the input values and assumptions used;**
- ii. some of the facility design information used in the GGA is not referenced or justified; and**
- iii. use of the current Scope 2 emission factor for NSW results in a slightly lower value for CO<sub>2</sub>-e diverted from the main electricity grid and therefore an estimated increase in net GHG emissions resulting from the facility. This emission factor is also expected to reduce over time which will reduce the benefit of facility substituting emissions.**

***c. GHG emissions estimation for emissions diverted from landfilling.***

The estimation of GHG emissions from decomposition of waste in landfill generally uses the methodology described under Part 5.2 of the NGER Technical Guidelines.

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<sup>6</sup> National Greenhouse Accounts Factors, Australian National Greenhouse Accounts (DEE, August 2016).

## ATTACHMENT A

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

The EPA notes the emissions estimation assumes there will be no emissions mitigation by the combustion of landfill generated methane (via flare or gas engine) as this does not currently occur at the Genesis landfill facility and 'would not form part of the future operations for the site'. The EPA notes that without the EfW facility it is likely some of the waste will be deposited at landfills other than the Genesis landfill facility that have methane treatment, as this technology is becoming more established for landfill GHG emissions mitigation. Such a scenario would significantly reduce the estimated GHG emissions diverted from landfilling, and thus the overall positive GHG impact from the operation of the facility.

**The EPA advises the estimation of GHG emissions diverted from landfilling is likely to significantly overestimate these emissions by assuming no methane emissions generated by landfilled waste will be combusted.**

**The EPA requires the GGA incorporate an emissions estimation scenario that is more realistic with respect to landfill gas capture and treatment.**

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

The GGA assumes a quantity of degradable organic carbon (DOC) that is significantly (2 times) higher than the previous GGA. This results in a doubling of the estimation of methane emissions from landfilling the waste, from 1,230,199 tpa CO<sub>2</sub>-e to 2,560,239 tpa CO<sub>2</sub>-e.

The increased quantity of DOC in the waste results from a change in the applied value for DOC fraction from 0.2 (for 'garden and green') to 0.43 (for 'wood'). However, the GGA incorrectly states (Section 10.3.3, footnote *n*) a DOC fraction for 'garden and green' has been used which results in an underestimation of GHG emissions from landfilling.

The EPA notes it is unclear why the less conservative value for 'wood' has replaced the value for 'garden and green' in the current GGA. The emissions estimation is highly sensitive to this value and therefore it should be clearly justified as appropriate and conservative for use in the GGA.

**The EPA advises the estimation of GHG emissions diverted from landfilling has effectively doubled by use of a less conservative value for the fraction of degradable organic carbon (DOC) in the waste.**

**The EPA requires the DOC fraction value used in the assessment is clearly justified as appropriate and conservative for use in the GGA.**

### **2. Estimated net GHG emissions.**

The estimated net GHG emissions resulting from the facility and the previous assessment are provided in the table below.

	<b><u>Current GGA</u></b> <b>(tpa CO<sub>2</sub>-e)</b>	<b><u>Previous GGA</u></b> <b>(tpa CO<sub>2</sub>-e)</b>
<b>Emissions from waste incineration</b>	505,069	629,784
<b>Emissions alternative to grid</b>	-944,624	-1,230,199
<b>Emissions diverted from landfill</b>	-2,560,239	-989,120
<b>Net GHG emissions</b>	-2,999,794	-1,589,536

The EPA notes the significant discrepancy in the estimated net GHG emissions arising from the significantly increased estimation of emissions diverted from landfill in the current GGA.

**The EPA requires the GGA clearly justify changes to assumptions to demonstrate the GGA is robust and conservative with respect to the estimation of net GHG emissions resulting from the facility.**

The EPA notes a minor error in GGA Table 10-4 for tpa CO<sub>2</sub>-e alternative to grid: the value includes an erroneous extra digit.