ENERGY RECOVERY FACILITY, NORTH QUAY, NEWHAVEN

IPPC APPLICATION REF: EA/PPC/BV8067IL

RESPONSES TO SCHEDULE 4 QUESTIONS ISSUED 8 FEBRUARY 2008

1. Please provide a justification for using the same N_2O contribution to Global Warming Potential (GWP) for all options; despite the fact that they involve different NO_x abatement techniques.

All the technical options considered in this BAT Assessment have flue gas recirculation and use either ammonia as a flue gas treatment reagent or do not apply secondary NOx control measures. As all options also have advanced combustion control systems all the options would provide the same low levels of N_2O indicated (< 5mg/Nm^3).

2. Please provide an estimation of the level of accuracy of the GWP for the options considered.

The input data used in the GWP calculation is based on figures provided either by process contractors (and based on technical guarantee levels) or taken from operational facilities and therefore can be considered the most reliable data available. We would expect the accuracy range from the figures used to be in the order of ±5%.

3 Please explain the reasons for the differences in the GWP for the options considered.

Table H1.15 Global Warming Potential in the H1 summary provides the GWP values for each option.

The table below provides more detail for each component of GWP.

	Substance	Global Warming Potential
Option 2	CO_2 Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-54,364
	N_2O Process Direct	1,394
	TOTAL	119,609
Option 1	CO_2 Direct Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-54,003
	N_2O Process Direct	1,394
	TOTAL	119,970
Option 3	CO_2 Direct Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-52,824
	N_2O Process Direct	1,394
	TOTAL	121,148
Base Case	CO_2 Direct Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-52,735
	N_2O Process Direct	1,394
	TOTAL	121,238

Option 5	CO_2 Direct Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-49,066
	N_2O Process Direct	1,394
	TOTAL	124,907
Option 4	CO_2 Direct Energy – fuel oil	2,149
	CO_2 Energy – waste	170,430
	CO_2 Energy – net electricity	-48,428
	N_2O Process Direct	1,394
	TOTAL	125,545

Note: GWP factors for waste derived from EA H1 software

From this breakdown of the GWP for each option it is evident that the difference between the Options arises from **CO_2 Energy – net electricity**. This is a measure of the net electricity exported by the process which, in the case of an ERF provides a negative figure due to the large excess of electricity generated compared to electricity consumed. The differences between the Options are due to the differing power consumptions associated which each treatment process within the Option considered.

4. Please explain the reasons why you have chosen an option which is not the best in terms of GWP. Please provide full details of other factors taken into account when choosing the preferred option, and how the overall assessment was made.

The EA H1 software tool enables assessments of GWP, Photochemical Ozone Creation Potential (POCP), Waste Hazard and Disposal Score (WH&D) and Air Quality Environmental Quotient (AQEQ) between different technical Options.

For GWP, there is a 1.36% difference between the Base Case option selected and Option 2, which has the lowest GWP. In this type of analyses we would expect approximately a ±5% error margin due to the complexity of the calculations. Therefore, the GWP assessment demonstrates that there is no material difference between the different options assessed in terms of GWP. In these circumstances it is sensible to consider other parameters where the most direct benefit can be realised.

Of the 3 options with lower GWP than the base case i.e. Options 2, 1, and 3 (in ascending order of GWP):

-Option 3 includes only flue gas recirculation for NOx control which alone would not meet the WID emission limits and is included simply as a reference for comparison purposes;

-Option 1 applies fluidised bed technology which as explained in sections H1.3 and H1.4.1 of the Application Appendix 4 H1 commentary, has a number of technical drawbacks which are considered to make it unsuitable for the long term high availability use required of the facility. In addition this option has 50% and 60% greater long term and short term respectively AQEQ, 70% higher waste disposal score and 60% and 50% greater NO_2 and SO_2 respectively POCP compared to the Base Case. .

-Option 2, moving grate with SNCR DeNOx and dry FGT system is inferior to the Base Case since there is a 10% greater short term Air Quality Environmental Quotient, a 70% higher waste disposal score, and a 26% higher SO_2 POCP.

Since the GWP is not the determining factor in this H1 assessment – due to the effectively identical results – it is more appropriate to consider these other important parameters.

5 Please provide information on what efforts were made to increase the use of waste heat for e.g. Combined Heat and Power (CHP) / heat use, including how the plant will be made ready to take advantage of any future such opportunities, and what – if any – obstacles were encountered

As explained in section H1.4.5 of the H1 Summary, Veolia will consider opportunities to develop heat or steam sales.

The steam turbine as installed will be fitted with a connection point for the extraction of steam which could provide heat for industrial use or to supply a district heating system.

Any steam extracted from the turbine will reduce the electrical power generated. Therefore, to realise the potential environmental benefits of heat use, users would need to be identified that would deliver the same long term security of use as that delivered by electricity users.

Veolia has wide experience of the operation of district heating systems, for example at its Sheffield ERF which serves one of the largest district heating systems in the UK. Suitable heat loads for such systems are provided by large centralised buildings such as blocks of flats, municipal and commercial buildings (offices, leisure centres, swimming pools, hospitals) or by suitable industrial facilities requiring steam for various processes. It is not practicable to retrofit district heating into individual residential properties nor is it within the control of Veolia to develop such schemes.

Veolia considered the range of potential consumers in the vicinity of the Newhaven facility and concluded that currently there are no suitable consumers in existence and as such it is not practicable to implement a CHP system at the time of construction of the facility. As with many potential district heating schemes, should a suitable demand be identified in the future, this could be developed.

General comments:

We would like to add a further statement regarding CO_2 and ERF facilities.

Recognition should be made to the greenhouse gas avoidance realised when incinerating waste that would otherwise be sent to landfill. First, the production of electricity is avoided elsewhere, and second, the organic fraction of waste sent to landfill produces methane which is over 20 times more potent a greenhouse gas compared to CO_2. As reported in Appendix H of the H1 Guidance document the GWP impact of methane emissions from landfill far outweigh the GWP impact of the combustion of residual municipal waste by a factor of 21.

The IPCC (Intergovernmental Panel on Climate Change) consider that significant GHG generation is avoided through (sic) state of the art incineration[2].

[2] Mitigation of global greenhouse gas emissions from waste: conclusions and strategies from the IPPC fourth assessment report.