

## APPENDIX B

### Note on Energy from Waste Permitting, R1 and Combined Heat and Power (CHP)

- B.1** Environmental permits are needed for a wide range of activities that might pollute the air, water or land.
- B.2** Schedule 1 of the Environmental Permitting regulations provides a listing of all of the activities that require a permit. When applying this schedule to an installation such as the proposed plant at Newhurst, an installation which generates electricity but which also burns waste, the Environment Agency faces a slight issue. They must decide whether the installation is primarily an energy production facility (a Schedule 1, Section 1.1, Part A1(a) activity) or a waste management facility (Schedule 1, Section 5.1, Part A1 (c)).
- B.3** The Environment Agency consider that the overriding reason for the existence of an installation such as that proposed for Newhurst is the management of waste and that therefore the installation falls under Schedule 1, Section 5.1, Part A1 (c).
- B.4** The fact that Newhurst is considered a waste management installation then raises the question as to whether waste being delivered to the site is being **disposed of** or **recovered** for a useful purpose.
- B.5** Annex II of the Waste Framework Directive contains another list of activities which are this time split up into activities considered to be “Disposal Operations” (D\*) and “Recovery Operations” (R\*). Unfortunately, this list contains two entries which could plausibly be considered to describe EfW operations:
- D10 Incineration on land
  - R1 Use principally as a fuel or other means to generate energy

However, the Annex continues to describe R1 activities as to include incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency (Energy efficiency =  $(E_p - (E_f + E_i)) / (0,97 \times (E_w + E_f))$ ) is equal to or above:

- 0,60 for installations in operation and permitted in accordance with applicable Community legislation before 1 January 2009,
- 0,65 for installations permitted after 31 December 2008

**B.6** Newhurst is expected to meet the R1 energy efficiency requirement and will therefore be classified as a waste recovery operation. This is demonstrated in the following spreadsheet extract. The installation is expected to achieve an energy efficiency rating above 0.8 even without CHP and this is significantly in excess of the R1 threshold of 0.65.

**Table B.1: Calculation of R1 Energy Efficiency Rating**

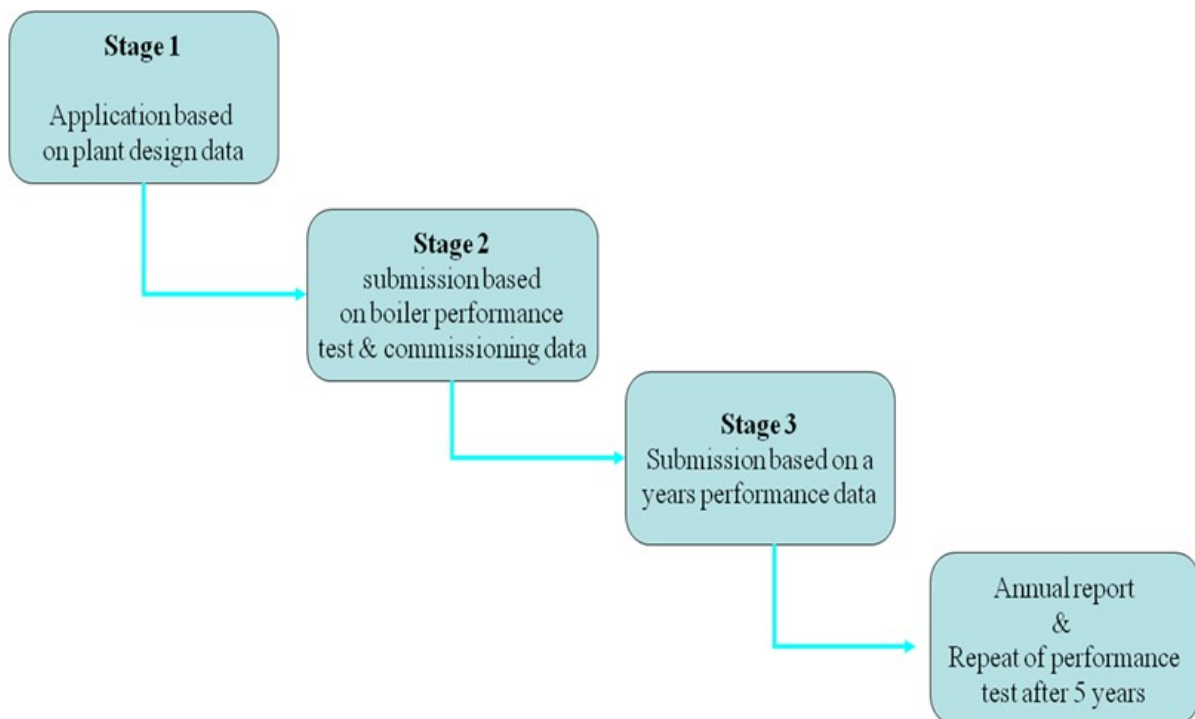
Site Name	Nehurst EfW	Energy of Waste Input (Ew) / (MWh/yr)	834000
Electricity efficiency factor (Fe)	2.6	Energy from Other Fuels (Ef)	1496
Heat efficiency factor (Fh)	1.1	Other Energy Imported (Ei)	1300
Waste Input / (te/yr)	300000	Exported Heat (Uh)	0
Lower Net Calorific Value / (MJ/kg)	10	Generated Electricity (Ue)	258000
Energy of Waste Input / (GJ/yr)	3000000	Energy Produced (Ue x Fe)+ (Uh x Fh)	670800

Energy Efficiency =	$\frac{(\text{Energy Produced} - \text{Energy from Fuels} - \text{Other Energy Imported})}{0.97 \times (\text{Energy of Waste Input} + \text{Energy from Fuels})}$
Energy Efficiency =	<b>0.82</b>
	<b>R1 Use principally as a fuel or other means to generate energy</b>

**B.7** All of the above requirements and details are quite new. In fact, the requirements have only just been transposed into the UK legislature and guidance from the Environment Agency regarding how to apply for R1 status still remains in draft.

However, the Environment Agency have confirmed that applying for R1 status will be a separate process to applying for a permit. This is an important confirmation as some of the wording the Newhurst permit could otherwise be (and has been) misinterpreted to suggest that the EA have somehow rejected the idea of it being a recovery operation. This is not the case.

As this extract from the Environment Agency's draft guidance shows, R1 status can be gained at the plant design stage and / or commissioning stage as well as when the plant is in operation.



**B.8** R1 status will not be permanent but instead will be subject to annual review and retesting every 5 years. The guidance also confirms that the plant does

not have to be “dedicated” to municipal waste incineration but must be of the same broad design as such dedicated plant and the term “municipal waste” is clarified as “waste from households, as well as other waste which, because of its nature or composition, is similar to waste from household” this is important as some people had suggested that the R1 formula would only apply to “dedicated” council / PFI type facilities.

**B.9** Despite the fact that Newhurst is anticipated to meet and exceed the R1 energy efficiency formula even in an electricity only configuration, the use of heat generated at the installation remains an attractive proposition for the following reasons:

- Although a heat distribution main is very expensive (£1000 / m) significant opportunities arise from prospects for the sale of heat energy.
- Once equipped with CHP, there is the possibility of claiming extra subsidies on the electricity produced, in the form of Renewables Obligation Certificates (ROCS).
- If a reasonable opportunity to utilise waste heat arises, the EA will require Biffa to act.

**B.10** The exact scale of the ROCs subsidies available is a complicated subject but a 25MWe EfW CHP Scheme where the biomass content of the fuel has been established or deemed at 50%, will receive ROCs on 50% of the electricity produced. In order to qualify for ROCs, EfW CHP Schemes over 25MWe must demonstrate at least:

- 35% overall efficiency (using the thermodynamic definition of efficiency, not the EU R1 version), and
- 10% Primary Energy Savings (PES) when compared with the alternative for the separate generation of electricity and heat.

**B.11** Given a significantly sized scheme, these requirements should be achievable. However, Newhurst, like most such schemes, finds itself in a chicken and egg

situation where significant heat users are likely only to be found following the construction of the installation.

**B.12** The Environmental Permit for Newhurst recognises this situation. The permit requires at Condition 1.2 that Biffa provides and maintains steam and/or hot water pass-outs such that opportunities for the further use of waste heat may be capitalised upon should they become practicable. Additionally, it will require Biffa to review the practicability of Combined Heat and Power (CHP) implementation at least every 2 years. The results must be reported to the Agency within 2 months of each review. As part of the application Biffa were required to produce a report regarding potential heat use (Heat Plan). The report found that in addition to exporting around 20MW of electricity to the National grid around 70 Mega Watts of heat could be captured and piped in a heat main to various end users. An initial desk-top assessment revealed a number of potential heat users within a 5km radius of the proposed Newhurst ERF. If practical opportunities to utilise waste heat are identified as a result of a review of the heat plan, a failure to use reasonable endeavours to implement such a scheme may be regarded as a breach of the requirement to “take appropriate measures to ensure that energy is recovered and used efficiently in the activities” as required by condition 1.2.1 of the permit.

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5<sup>th</sup> October 2011