

12 March 2010

Councillor Katrina Bull
Nottingham City Council



By email

c.c. information.governance
Jon Robinson, Nottingham Evening Post

Dear Councillor Bull,

Efficiency of Eastcroft Incinerator = 31%?

In the Evening Post on 27 February you were quoted as saying "We have now got one of the most efficient Energy from Waste plants in Europe". I would be grateful if you would let us have data to support this claim. Can you please consider this as a request under the Environmental Information Regulations 2004.

I can believe that the Eastcroft Incinerator is one of the most efficient in the UK (sadly), but your claim that it is amongst the best in Europe requires justification.

I have seen some figures for the Eastcroft Incinerator for 2007 (calendar year) which suggest that only 10% of heat energy in the waste was converted to electricity exported to the grid, and only another 21% sold as heat through the district heating system. This is based on information given by WRG to the planning inquiry into expansion of the incinerator in September 2008 (see attached paper WRG10.pdf – relevant information on page 2), and information from the City (see attached letter dated 29 January 2010).

The basic figures are (for 2007):

Energy input to the incinerator: 154,069 tonnes waste with calorific value 9.5MJ/kg = 1,464TJ = 406.7GWh.

Energy output from incinerator = 994TJ steam + 114TJ hot water = 1,108TJ = 307.8GWh (75.7% of energy in waste).

Energy input to EnviroEnergy = 307.8GWh from incinerator + 38.0GWh from supplementary gas (11% according to WRG).

Energy output from EnviroEnergy:

- electricity: 65.2GWh generated, of which 46.4GWh exported to the grid (the rest used in incinerator or EnviroEnergy)
- heat: 161.1GWh distributed through the district heating scheme, of which 94.845GWh actually sold

If we attribute 89% of EnviroEnergy's output to the incinerator, useful outputs exported and sold = 41.3GWh electricity (10.2% of energy in waste) + 84.4GWh

heat (20.8% of energy in waste).

(A more detailed analysis of the data is below.)

The City has so far refused to release more recent data comparing heat distributed through the district heat system with heat actually sold. (You will also note that the City's letter of 29 January claims that outputs from EnviroEnergy are not relevant to calculating the efficiency of the incinerator!!!)

The obvious question is what evidence do you have of the extent that the recent refit of the incinerator (at a cost of around £20m to the City and County over the last 3 years) will increase the overall efficiency from 31%, and how does that compare to the best in Europe?

Yours sincerely,

A handwritten signature in black ink that reads "Nigel Lee". The signature is written in a cursive, flowing style.

Nigel Lee

Analysis of data for Eastcroft Incinerator and EnviroEnergy for 2007

WRG gave figures to the planning inquiry in September 2008 showing that in 2007 the incinerator burnt 154,069 tonnes waste with estimated calorific value of 9.5MJ/kg – a total of 1,464TJ (406.7GWh). [A gigawatt hour is a million kilowatt hours. See below for an explanation of units.]

994TJ (276GWh) steam and 114TJ (31.7GWh) hot water were exported to the London Road heat station operated by EnviroEnergy, a company wholly owned by the City Council.

WRG claimed that in the same period EnviroEnergy produced 65.2GWh electricity and distributed 161.1GWh heat through the district heating system. Of the 65.2GWh electricity generated, 9.8GWh was used in the incinerator and 8.9GWh in the district heating system, so only 46.4GWh was exported to the grid (11.4% of heat in the waste). However, only 89% of this was attributed to heat input from the incinerator, the other 11% being from supplementary gas burnt when the incinerator was off-line.

The City has recently produced figures estimating that in 2007 94.845GWh heat was sold through the district heating scheme (and a further 28.762GWh supplied to the incinerator at no cost).

Putting all these figures together (and assuming that both WRG's and the City's figures are correct), for 2007 (all figures in GWh):

2007	GWh
Calorific value of waste burnt in Eastcroft Incinerator	406.7 (100%)
Heat exported to EnviroEnergy	307.8 (75.7%)
89% of EnviroEnergy's output:	
electricity produced = 89% x 65.2	58.0 (14.3%)
heat distributed through the district heating scheme = 89% x 161.1	143.4 (35.3%)
EnviroEnergy's total energy output (from waste) = 58.0 + 143.4	201.4 (49.5%)
Electricity sold to grid = 89% x 46.4	41.3 (10.2%)
Heat sold through district heating scheme = 89% x 94.8	84.4 (20.8%)
Total energy (from waste) sold = 41.3 + 84.4	125.7 (31.0%)

Note on units:

k = kilo = thousand

M = mega = million

G = giga = billion

T = tera = million million

Energy is measured in joules (J). Power is measured in watts (W).

1 watt = 1 joule per second

1 kilowatt hour (kWh) = 3.6 MJ

1 gigawatt hour (GWh) = 3.6 TJ