YNYS RESOURCES LIMITED

Review of Proposed EfW Development at Javelin Park

because efficiency matters

Report for:

GlosVAIN

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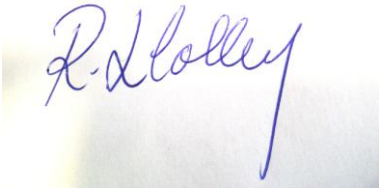

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Glossary of Terms

Term	Description
Biodegradable waste	This is waste that is able to decompose through the action of bacteria or other microbes, including materials such as paper, food waste and garden waste.
Combined Heat and Power (CHP)	Where energy is recovered from waste, whether from biogas, syngas, or from the heat derived from combustion, then energy can be recovered in the form of electricity, heat or both. There are usually trade offs between how much of the one and the other can be derived. Where both are recovered, this is referred to as 'combined heat and power' (or CHP).
Commercial & Industrial waste (C&I)	Commercial waste arises from premises used for trade, business, sport, recreation or entertainment. Industrial waste originates from factories; premises related to any public transport services; any premises used for supply to the public of gas, water or electricity or the provision of sewerage services; or any premises used for the provision to the public of postal or telecommunications services.
Composting	The degradation of organic wastes in the presence of oxygen to produce a fertiliser or soil conditioner. This can either be an enclosed process (in-vessel) or operated as an open windrow process.
Dry recyclables	Materials such as paper, glass, textiles and cans that can be collected through kerbside schemes or bring banks.
Energy from Waste	The process of recovering energy from waste by combustion. Waste can either be burned directly, as in Modern Thermal Treatment (see below), or energy products can be obtained through pre-treatment, such as refuse derived fuel (mechanical-biological treatment), synthesis gas (gasification) and biogas (anaerobic digestion). These products can be burned to provide heat which can in turn be used directly or used to generate electricity (or both, as is the case with combined heat and power or CHP). Energy can also be recovered in other ways, such as using biogas or synthesis gas to fuel vehicles or using refuse derived fuel to fuel industrial processes such as cement manufacturing.

Gasification	This process is defined in the Renewables Obligation Order 2002 as meaning the substoichiometric oxidation or steam reformation of a substance to produce a gaseous mixture containing two or all of the following substances: oxides of carbon, methane and hydrogen. An advanced thermal treatment for reducing volume, weight and biodegradability of residual waste.
Green waste	Vegetation and plant waste from household gardens and public parks and gardens.
Hazardous waste	A waste possessing one or more of the 15 hazardous properties as set out in the Revised Waste Framework Directive (2008/98/EC)
Household waste	Waste from domestic properties including waste from residual refuse collections, material collected for recycling and composting, plus waste from educational establishments, nursing and residential homes and street cleansing waste.
Landfill	Landfills are areas of land in which waste is deposited, which often consist of disused quarries. In areas where there are limited or no ready-made voids, the waste is deposited above ground and the landscape is contoured, which is named landraising.
Mechanical Biological Treatment	The treatment of waste involving both mechanical and biological processes. Mechanical means sorting or reducing the size of the waste pieces. 'Biological' means either drying the waste so it can be burnt to generate energy as a Refuse Derived Fuel (RDF) or composting the organic part of the waste to produce a 'compost like' product.
Material Recovery Facility (MRF)	A transfer station for the storage and segregation of recyclable materials. Also sometimes known as a material recycling facility or materials recovery facility.
Modern Thermal Treatment (MTT)	Modern Thermal Treatment is used to refer to incineration which complies with the limit values of the latest Incineration Directive (2000/76/EC. Incineration is the controlled burning of waste in the presence of excess air, either to reduce its volume or its toxicity. Energy is derived from the process, either in the form of electricity, heat, or both. Ash residues can either be recycled or landfilled.
Municipal waste	This includes all waste collected by a Waste Collection Authority, or its agents, such as waste from household, municipal parks and gardens, beach cleansing, commercial or industrial premises, and fly- tipping.

Pyrolysis	Defined in the Renewable Obligation Order 2002 as meaning the thermal degradation of a substance in the absence of any oxidising agent (other than that which forms part of the substance itself) to produce char and one or both of gas and liquid. An advanced thermal treatment for reducing volume, weight and biodegradability of residual waste.

Recycling	Recycling involves the reprocessing of waste material, either into the same product or a different one. Many non-hazardous wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled.
Recovery	Recovery is defined in Waste Strategy 2000 as meaning obtaining value from waste through reuse; recycling; composting; other means of material recovery (such as anaerobic digestion); or energy recovery.
Reuse	The commercial sector can reuse products designed to be used a number of times, such as reusable packaging. Householders can buy refillable containers, or re-use plastic bags. Reuse contributes to sustainable development and can save raw materials, energy and transport costs.
SRF – Secondary Recovered Fuel	SRF is a refined form of RDF intended for use in energy recovery facilities, which has been produced to meet a recognized standard. Production of SRF from nonhazardous waste is a growing industry in Europe and thus, the European Committee for Standardization (CEN) published a set of Technical Specifications (TSs) for the production and trade of SRF. CEN/TS 15359 Solid Recovered Fuels – Specifications and Classes.
Treatment	This involves the mechanical, chemical or biological processing of certain types of waste to render them harmless, to reduce their volume before landfilling, or to recycle certain materials.
Waste	This is the wide-ranging term including most unwanted materials and is defined by the Environmental Protection Act 1990 and case law. Explosives and radioactive wastes are excluded.
Waste arisings	This is the amount of waste produced in a given area during a given period of time.
Waste hierarchy	The waste hierarchy, introduced by the EU Waste Framework Directive, is an abstract framework that prioritises the options for waste management. It represents a sliding scale starting with the most sustainable option (reduction) and ending with the least sustainable option (disposal): • reduction; • re-use; • recycling; • recovery; • disposal.

Abbreviations

AD	Anaerobic Digestion
AWC	Alternate Weekly Collection
BMW	Biodegradable Municipal Waste
BVPI	Best Value Performance Indicator
CHP	Combined Heat and Power
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act 1990
ER	Environmental Report
EU	European Union
GCC	Gloucestershire County Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GWP	Gloucestershire Waste Partnership
HRC	Household Waste Recycling Centre
JMWMS	Joint Municipal Waste Management Strategy
LATS	Landfill Allowance Trading Scheme
MBT	Mechanical Biological Treatment
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MTT	Modern Thermal Treatment
MWMS	Municipal Waste Management Strategy
NGO	Non Governmental Organisation
ODPM	Office of the Deputy Prime Minister
PPS	Planning Policy Statement
RDF	Refuse Derived Fuel
RWFD	Revised Waste Framework Directive
RSS	Regional Spatial Strategy
SEA	Strategic Environmental Assessment
SRF	Solid Recovered Fuel
TMR	Total Material Requirement
UK	United Kingdom
WCA	Waste Collection Authority
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment
WET	Waste and Emissions Trading Act
WLP	Waste Local Plan
WRAP	Waste Resources Action Programme

Contents

Executive Summary

This report by Ynys Resources Ltd has been commissioned by Gloucestershire Vale Against Incineration (GLOSVAIN) in regard to the proposal to develop a 190,000 Tonnes per annum EfW plant at Javelin Park, planning application reference no. 12/0008/STMAJW (the Application), submitted 31st January 2012.

It has been undertaken as an independent and objective review of the current situation in regard to the imminent planning Determination. It is acknowledged that there has been significant consultancy during the development process. This document has not set out with the intention of replicating any work, but to make observations in the light of the current economic and legislative situation, taking into consideration advice that has already been provided.

Review of the original case for the project

GCC pursued a significant consultation and procurement process dating back to 2005. During this process, issues and legislation which initially stimulated the initiative, have progressed. It was considered that landfill capacity was diminishing in the area and that LATS would be financially burdensome in addition to Landfill Tax. **The Landfill Allowance Trading Scheme has a conclusion date for 2013**

GCC led PFI application was unsuccessful

In order to obtain finance and ensure certainty in regard to availability of access to treatment capacity GCC undertook a PFI application. The application was declined by DEFRA due to the expectation of over capacity of EfW in the marketplace. **There is projected overcapacity for UK EfW by 2015/16.**

Review of waste arisings upon which the plant capacity is justified.

Part of the concern of the local residents is that there is inadequate demonstration of need. This has primarily arisen from their analysis of local and national waste figures, corroborated by reports in the public domain by Eunomia[1] and Gaia[2] amongst others. The Waste Core Strategy does not specify a requirement for need for development of recovery facilities upon an allocated site, however, as these sites are limited it would be prudent to support development for proposals "*towards the top of the waste hierarchy*"

[1] Eunomia Research and Consulting (2012), Residual Waste Infraestructure Review. High level analysis - Issue 3.
[2] Jofra Sora, M; Ed: Dr. Ventosa I P, (2013) Incineration overcapacity and waste shipping in Europe: the end of the proximity principle?: Commissioned: Global Alliance for Incinerator Alternatives

Consideration of extent of Complience with Revised Waste Framework Directive (2008/98/EC).

The revised Directive provides legally enforceable direction to introduce segregated dry recyclables collection, separate biowaste collection and processing, and requirement to promote the implementation of the waste hierarchy. The Directive provides legal standing to the principle that recovery processes must be undertaken in a manner that does not prejudice the waste hierarchy.

No heat or cooling use has been identified

This leaves the proposal at risk of failing another component of the revised Waste Framework Directive, an efficiency test for compliance as a recovery facility and to be classified as disposal, if the test is failed.

This report highlights that, due to the fact that the overall plant efficiency is low, resulting from a lack of CHP facility, the proposed development resides at the bottom of the waste hierarchy, as a disposal facility. As such, the proposal does require need to be demonstrated as per the WCS and PPS10. Information from current waste projection data suggests that 'need' is not demonstrated and therefore the application has to show that "it will not prejudice movement up the waste hierarchy".

There is no front end recovery of recyclables

Resulting in the proposal favouring disposal/recovery, subject to test above, and risk of failing to implement the waste hierarchy

Production of approximately 8,000 Tonnes per annum of hazardous waste,

The amount of hazardous waste typically found in MSW is approx 0.5%, (950 tonnes). Due to the concentrating of metals and other substances during the EfW process, this figure is converted to 4% hazardous waste. This is in contravention of the Landfill Directive and local requirements of the WCS.

The agreement for landfill disposal of hazardous wastes is not sufficient to meet UBBs projected production. Disposing of the material to landfill without applying further treatment demonstrates a non compliance with the waste hierarchy.

There is no flexibility in the system design

This is needed to future proof against further legislation requiring performance improvements in regard to the waste hierarchy and improved energy efficiency.

The issues listed above suggest that there is adequate reason to reconsider the nature of waste management facility choice currently proposed, not least as the issues represent contravention of numerous articles within the Gloucestershire Waste Core Strategy and Joint Municipal Waste Management Strategy.

> *The Residual Waste Procurement Plan for the diversion of residual municipal waste from landfill: Cabinet Date 28 November 2007*
>
> *2 What is the Residual Waste Procurement Plan ("the Plan")*
> *2.1 The objective of this Plan is to procure a long term residual waste solution* ***to flexibly manage*** *Gloucestershire's residual municipal waste up to 2040.*

In consideration of the current situation, it appears that the proposal does not demonstrate flexibility, and has reduced in significance. It is an opportunity to re-visit the Final Environment Report for the Gloucestershire JMWMS in order to re-appraise the options presented therein.

This may lead towards the flexible solution outlined within the WCS 2027 vision.

> *Our Vision for 2027*
> *The 'residual' waste that cannot be re-used, recycled or composted is seen as a valuable resource and is managed through a* ***number of 'strategic' waste recovery sites*** *(>50,000 tonnes/year) located in the central area of the county, proximate to the main urban areas along the M5 corridor including Gloucester and Cheltenham.*

It is also suggested, that following the ending of LATS, a situation of projected EfW overcapacity, classification of the proposed EfW facility as a disposal activity and failing to comply with the waste hierarchy, contracted waste supply volumes and index linked financial penalty, rather than providing service and financial certainty, the proposal represents significant risk to GCC.

If Gloucestershire were to invest in 'flexible' pre-treatment facilities as recommended in review of the JMWMS, CAPEX would be lower, recycling figures increased, hazardous waste arisings remain level and opportunities for more efficient use of fuel and heat could be found, ideally using

improved transport efficiency.

1.0 Introduction

1.1 The local residents, as a collective lobbying group, Gloucestershire Vale Against Incineration (GLOSVAIN), are of the opinion that the 190,000 Tonnes per annum capacity conventional EfW technology to provide a sustainable waste management strategy to Gloucestershire, as per the proposed development at Javelin Park, is flawed. The group has made substantial representation through referenced Policy and have requested an independent third party opinion to investigate their concerns.

1.2 The Application is the culmination of an initiative by GCC to seek a solution to fulfilling the requirements of Landfill Directive targets. GCC pursued a significant consultation and procurement process dating back to 2005. During this process, issues and legislation which initially stimulated the initiative, have progressed. It was considered that landfill capacity was diminishing in the area and that LATS would be financially burdensome in addition to Landfill Tax.

1.3 In order to obtain finance and ensure certainty in regard to availability of access to treatment capacity GCC undertook a PFI application. The application was declined by DEFRA due to the expectation of over capacity of EfW in the marketplace.

> *Spending Review 2010 - Changes to Waste PFI Programme Supporting Analysis - 6 December 2010*
>
> *Introduction*
> *1.1 Spending Review Decision*
> *As part of the Spending Review process Defra concluded that seven waste infrastructure projects should not receive the PFI credits which had provisionally been allocated to them, on the basis that, on reasonable assumptions,* ***these projects would no longer be needed in order to meet the 2020 landfill diversion*** *targets set by the European Union.*

1.4 The project design capacity was based upon assumptions from early in the process which have not borne out. Assumptions for waste growth have been arrested by a combination of waste minimisation initiatives and reduction in economic output.

1.5 The project development process has been protracted and subject to an enormous amount of consultancy contribution.

1.6 The consultancy Eunomia was chosen by GCC to carry out a review of the Joint Municipal Waste Management Strategy (JMWMS).

> *Final Environment Report for the Gloucestershire JMWMS*
>
> *The Environmental Report*

The ER presented here details the results of an assessment process designed to highlight the environmental, social and economic impacts of the strategy being proposed together with its alternatives. In doing so it will inform the Gloucestershire authorities and the consultees, and ***thus help guide the selection of waste management initiatives and the implementation of them in such a way that any negative impacts can be avoided, mitigated and monitored****.*

1.7 The consultancy chosen by GCC to review the JMWMS, Eunomia is now of the opinion that an annual waste growth of 0.5%pa is a realistic figure upon which to base future projection calculations.

1.8 Eunomia is also of the opinion, in agreement with the PFI Spending Review, that there will be an over capacity of EfW within a few years, suggesting that the UK is "moving to a situation of potential overcapacity in 2015/16."

1.9 The review of the JMWMS appears to suggest that, when considering Strategy Delivery and funding, it is suggested that the EfW technology choice is more related to financial risk avoidance rather than optimum performance.

1.10 It is suggested that following the ending of LATS, a situation of projected overcapacity, classification of the proposed EfW facility as a disposal activity and failing to comply with the waste hierarchy, contracted waste supply volumes and index linked financial penalty, rather than providing service and financial certainty, the proposal represents significant risk to GCC.

1.11 Further, the current proposal, if supported, would contravene much of the advice presented by Eunomia to "*avoid and mitigate risk*" in its review of the JMWMS.

1.12 This review document identifies weaknesses in the concept of developing the proposed conventional EfW plant without heat recovery, pre-treatment or hazardous waste by-product treatment.

2.0 Review of Project Origin

2.1 The project originated from as interpretation of the projected effect of drivers, current at that time. This included, landfill availability, Landfill Directive targets for avoiding biodegradable waste to landfill and the Landfill Allowance Trading Scheme (LATS).

2.2 These drivers have changed.

The Residual Waste Procurement Plan for the diversion of residual municipal waste from landfill: Cabinet Date 28 November 2007

> *1.2 "Landfill space is running out"*
>
> *Landfill Allowance Trading Scheme ("LATS"), are now trading at about £40 per tonne, but in the coming years are likely to soar above £100 per tonne.*

2.3 DEFRA has announced the ending of the Landfill Allowance Trading Scheme (LATS) after the 2012/13 scheme year in England. GCC will therefore not specifically be penalised for landfill of biodegradable material beyond Landfill Tax, which will be £72 with effect from April 2013 and be at least this until 2020. Providing a solution to the potential cost penalty of LATS was a primary driver during the project. Conventional incineration as proposed, still produces 13,000 tonnes of waste to be landfilled subject to the tax.

2.4 GCC is now of the opinion that there is adequate landfill capacity in the region.

> *Technical Paper WCS-A Waste Data (Update 2010) November 2010*
>
> *S7. Landfill Capacity Summary*
> *Landfill life – how many years left?*
> *S7.3 Although this is a complex matter, with a wide range of scenarios that need to be carefully considered, this paper suggests that, based on the current void space available, and current rates of tipping there is between 10 and 13 years of non-hazardous landfill life remaining in the County. It is also estimated that there is also over 22 years of hazardous landfill life remaining.*
> *S7.4 However the estimates given are conservative and it is very likely that Gloucestershire's landfill life could be significantly extended as a result of increased recycling/composting activities, progress in building residual treatment facilities, future tax increases, and general changes in society's attitude to waste.*

2.5 Eunomia, author of the Review of the JMWMS, is also of the opinion, in agreement with the PFI Spending Review, that there will be an over capacity of EfW within a few years, suggesting that the UK is "moving to a situation of potential overcapacity in 2015/16."

Residual Waste Infrastructure Review High Level Analysis Issue 3 Nov 2012

1.2 Summary of Current Position for the UK
As shown in Figure 2, the key data for the UK can be summarised as follows:

Without any change in residual waste quantities, however, there would be overcapacity of 6.9 million tonnes (per annum) if the 19.6 million tonnes of waste treatment capacity that has planning consent reaches financial close and subsequent operation; and
Planning consent is being sought for a further 4.4 million tonnes of waste treatment capacity.

2.6 The Eunomia review of the JMWMS appears to suggest that, when considering Strategy Delivery and funding, it is suggested that the EfW technology choice is more related to financial risk avoidance rather than optimum performance.

8.2.17 Minimise Costs (Econ 2)
The costs associated with different waste treatments are difficult to appraise in a manner which gives full meaning to the Gloucestershire authorities. It is common to find cost estimates in public documents which seek to give an idea of capital and operating costs, but from the Gloucestershire authorities' perspective, what matters is the cost of the technology under a particular contractual arrangement. ***This is likely to be influenced by, amongst other things (including scale, and the particular technology design), the chosen approach to financing and procuring the technologies ultimately deployed.*** *This is because these factors affect the cost of finance, as well as the profile for risk sharing and transfer with the project partners. Where project risks lie determines whether or not, and how, they are internalised in the cost of the project, or whether they are retained by the authority.*

5.3.7 Core Objective 6: Delivering the Strategy
"To implement this strategy, through clear leadership, accountable decision-making, timely investment and resourcing. We will look to secure sustainable funding to continuously improve Gloucestershire's waste management service."

Given that this objective is about implementing the plan and funding, there are no direct environmental or social benefits arising. *The appraisal of this option assumes that all other objectives are delivered on time and cost effectively. Given the wording surrounding sustainable funding, this objective has been assessed as impacting positively upon Econ 2.*

2.7 It is therefore suggested that following the ending of LATS, a situation of projected EfW overcapacity, classification of the proposed EfW facility as a disposal activity and failing to comply with the waste hierarchy, contracted waste supply volumes and index linked financial penalty, rather than providing service and financial certainty, the proposal represents significant risk to GCC.

2.8 The current proposal, if supported, would contravene much of the advice presented by Eunomia to "*avoid and mitigate risk*" in its review of the JMWMS.

3.0 Review of Waste arising projections

Household Waste

3.1 The projections for waste arisings calculated in the original PFI bid were substantially higher than has actually occurred. Since 2007, waste has effectively begun to decouple from economic growth both locally and nationally. This is evidenced by a reduction in arisings prior to the economic downturn. Calculations of arisings are being revised frequently as the many different forces influencing waste arisings downwards take effect.

3.2 Increasing recycling services has highlighted the extent of waste arisings to all residents of the UK and has been shown to influence behaviour change. WRAP in its various studies on food waste concludes that segregating food waste for recycling has the further impact of reducing the amounts generated: an “in sight in mind” effect. This is potentially true of all waste streams and could be steering people to adopt a natural reduction in arisings, especially through consumption behaviour and reuse/recycling participation.

3.3 In addition various initiatives in the retail sector such as the two Courtauld agreements have lead to supermarkets reducing substantially the amount of packaging on products bought by the householder, in many cases by up to 60%. This upstream change has a direct impact downstream. Packaging material types are also changing, many items previously packaged in glass e.g. premium ranges, are now packaged in plastics.

3.4 The Waste and Resources Action Programme (WRAP) released in October 2012, a new set of results for the performance of phase 2 of the Courtauld Commitment, a voluntary scheme aimed at reducing food and packaging waste in the grocery sector. The figures show a significant reduction in supply chain waste, which has been cut by 8.8%, much more than the initial 5% target. Phase 2 of the Commitment runs from 2010 to 2012 and requires signatories to reduce food waste by 4%, reduce grocery product and packaging supply chain waste by 5% and reduce the carbon impact of grocery packaging by 10%. WRAP has described results so far as 'good' and 'indicative of the hard work that signatories have been putting in'. Forty-two retailers, brands and suppliers are currently signed up to the Commitment and WRAP is currently working on a potential third phase.

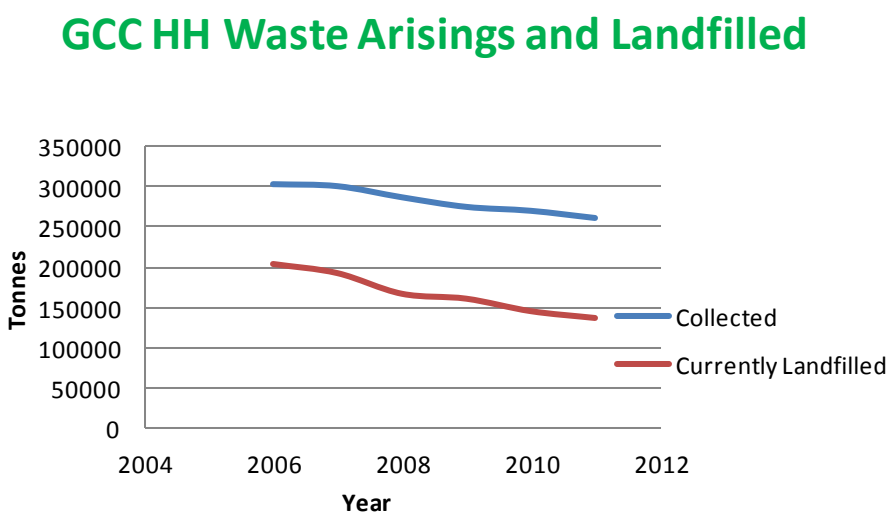
3.5 The effect of the Coutauld Commitment has been to reduce waste at source.

3.6 The “Love Food, Hate Waste” programme has led to a decline in tonnages of food waste at the household. In 2008 food waste accounted for 8.3 million tonnes which reduced to 7.2 million tonnes by 2010

3.7 Technology developments such as nano-technology mean that products have a longer shelf life, again reducing waste arisings.

Current Situation Household Waste Collected and landfilled [3] managed by GCC

Year	2006	2007	% Change	2008	% Change	2009	% Change	2010	% Change	2011	% Change
Total Collected	303,421	300,861	-0.84	286,791	-4.68	274,580	-4.26	269,622	-1.81	260,498 ??	-3.4
Total Landfilled	203,137	192,015	-5.47	166,946	-13.06	160,944	-3.59	145799	-9.41	137,452	-5.73



3.8 As can be seen from the tables above, the trend is a decrease in waste arisings. Household waste arisings have been used as this is the most consistent data. It is interesting to note that the decrease per head is even greater, but this has been tempered by a rise in population. Landfill figures have been used as these are verified by the EA, and so are reliable sources.

Future Waste Arisings

3.9 Unfortunately data for the first three quarters of 2012 – 2013 is unavailable but elsewhere in the UK the trend continues to be a downward one. In neighbouring Wales, the first quarter Apr-

[3] Figures from Waste Dataflow

June saw a 3% reduction in arisings to the same quarter in 2011. For the purposes of the arisings in Gloucester CC, this review has taken a conservative 0.5% decrease for this year and then calculated based on the predicted growth in the WCS.

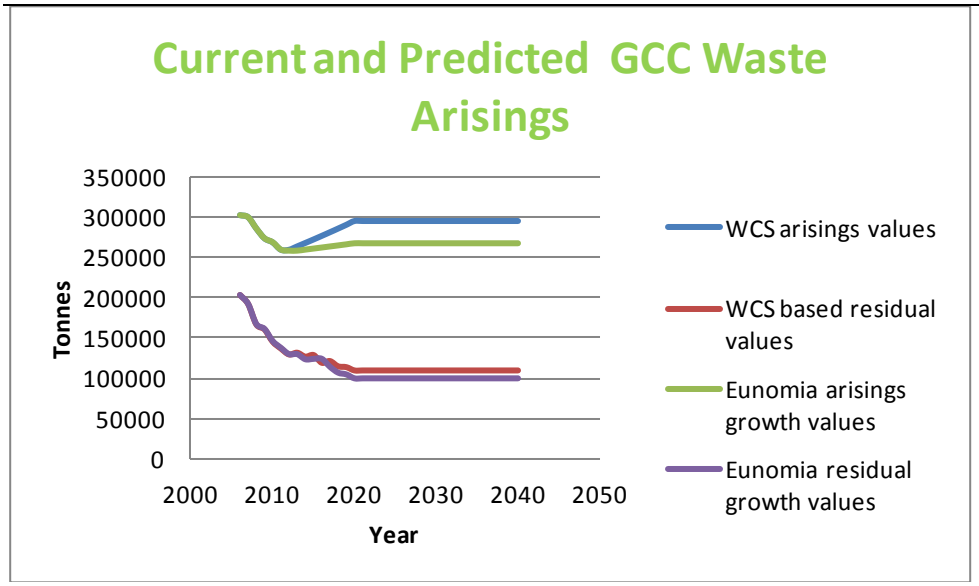
An inspectors Report in August 2012 challenged these assumptions please see excerpt below.

Figure 3.1

Criticisms of the assumptions underlying the 1.6% growth figure may be summarised as follows:

- the research was undertaken during much more favourable economic circumstances which would have lead to higher waste production per household;
- the figure is influenced very significantly by a high growth in the amount of waste taken to the Household Recycling Centres (HRC) which is not properly explained in the research;
- although account is taken of one-off planned service changes, none is taken of future legislative and fiscal measures which will lead to reduced levels of waste production;
- no account is taken of the current and likely continuing economic downturn in the early years of the CS when the compounding effect for later years of a high initial growth rate is at its greatest; and
- the CS should plan for zero growth in MSW rather than working towards zero growth by 2020 making the necessary service changes, such as not collecting green waste but leaving it for home composting, required for this to be achieved.

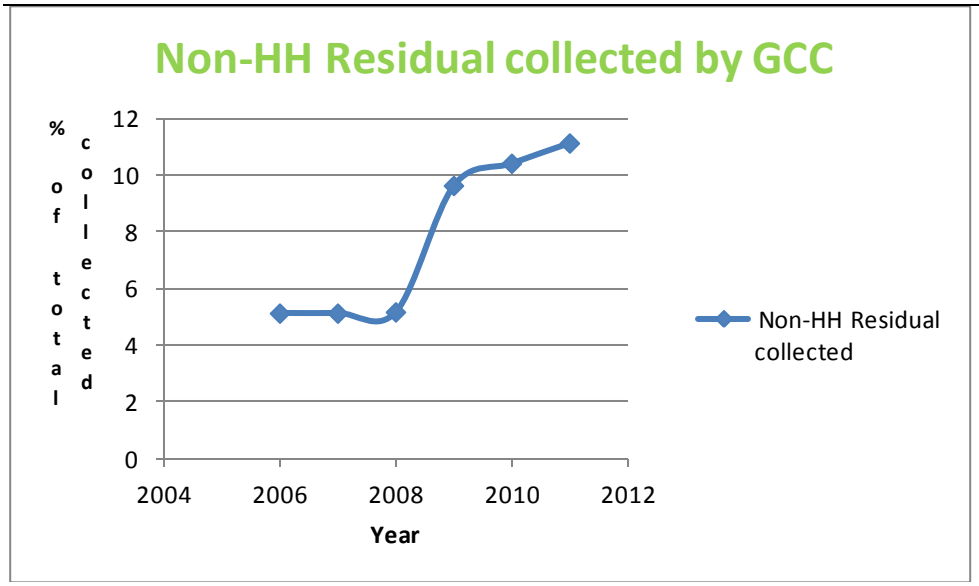
As the WCS states a target of zero waste growth by 2020, an assumption has been made that this will happen. For comparison, the predicted changes in the Eunomia report " Residual Waste Infrastructure Review, November 2012, are also used.



The residual values do not include landfill figures post 2015

3.10 As can be seen, by 2020 the figure available for EfW using GCC WCS growth rates and assuming the recycling rates as set out in the WCS, from the current base level is 110,686. If the non-household GCC collected waste is added to this figure would be a total of 127,777, assuming rates of commercial waste collected remain constant. The revised figure put forward by GCC assuming a recycling rate of 60% was 136,213. The figure using growth rates predicted by Eunomia and adding commercial waste to the HH collected is 116,000 a discrepancy of 20,000 tonnes.

3.11 In addition to this the Resource Futures Report shows that there are significant amounts of paper, card and recyclable plastics remaining in the waste stream and only 49% capture rate of food wastes. If any landfill/incineration bans were to come in via Defra or the EU this would significantly affect the residual tonnages of waste available for EfW.



Total GCC MSW Figures for 2011/12

Total Waste Collected	HH waste collected	Recycled or Composted	Non Household Collected	Non household Recycled or Composted	Non-Household Residual	Household Residual
280,203	262,660	124,739	17,543	451	17,091	137,821

'Non household sources (excl. recycling)' includes any wastes collected by a local authority from non-household sources (i.e. not covered by Schedules 1 and 2 of the Controlled Waste Regulations 1992). It includes non-household material which was collected for recycling but actually rejected at collection or at the gate of a recycling reprocessor.
'Non household recycling'' includes rubble and municipally collected materials for recycling from commercial sources. It excludes material which was collected for recycling from non-household sources but actually rejected at collection, during sorting or at the gate of a reprocessor.

However, it is worth noting that the non-household residual waste has risen sharply since 2008 from 5%-11% or 10,000tonnes to 17,000 tonnes. This is affecting the total MSW waste arisings. In the WCS an assumption is made that the rate of non-HH would remain constant. The recycling rate of non-household is very low at present at 2.6% this would need to rise in order to meet the recycling targets of the WCS by 2020.

Commercial & Industrial Waste Arisings

3.11 The WCS identifies a capacity deficit for Recovery of between 43,000 and 77,000 tonnes of C&I waste by 2020. This is based on 2008 figures and does not take into account the decreasing trend in C&I waste. Recovery in this instance also includes Anaerobic Digestion, Sewage Treatment Facilities, EfW and MBT. The contracted amount GCC collects has increased from approx 10,000 tonnes to approx 17,000 tonnes since 2008. This figure is likely to vary as the C&I fraction of MSW will depend on market forces and therefore can't be relied on to satisfy contract requirement.

3.12 Recycling levels are likely to increase substantially with the C&I sector, due to drivers such as material scarcity, costs and WFD segregation requirement. In addition, a number of government initiatives are targeting the hospitality, retail, food producers, tourism and manufacturing sectors. These are being adopted on a wide scale.

WRAP Hospitality and Food Service Agreement which parallels the Courtauld Agreements

3.13 WRAP are working with the hospitality and food service sector to help it reduce food waste, launching a separate voluntary agreement last year. Already more than 100 organisations have signed up to this latest initiative across the UK from small bed and breakfast operations to major catering suppliers. Changes are being implemented which will reduce food and associated packaging waste by 5% and increase recycling in this sector to 70%

4.0 Review of Compliance with Revised Waste Framework Directive

4.1 The WCS supplementary Technical Evidence Paper WCS-Q advises that there is little potential for heat use at the proposed site.

> *Waste Core Strategy Technical Evidence Paper WCS-Q*
> *Energy from Waste and Combined Heat & Power Potential - December 2010*
>
> *4. Assessing the CHP potential of the 13 site options*
> *Site 4.Javelin Park*
> *Recommendation*
> *The initial assessment work indicates that there would be* ***a limited demand for a retrofitted heat network*** *within existing nearby development.*

4.2 Due to the fact that the overall plant efficiency is low, resulting from the lack of CHP facility, the proposed development resides at the bottom of the waste hierarchy. As such, the proposal requires need to be demonstrated as per the WCS and PPS10. Information from current waste projection data suggests that 'need' is not demonstrated and therefore the application has to show that "it will not prejudice movement up the waste hierarchy".

> *Waste Core Strategy*
> *Technical Paper WCS-F Making Provision for Waste Management Facilities*
> *Living Draft January 2008*
>
> *S5. The purpose of not requiring need to be demonstrated for proposals towards the top of the waste hierarchy is to encourage proposals that drive waste management away from disposal and to increase industry competitiveness.*
>
> *57. The companion guide to PPS10 (para 8.16) takes the matter of demonstrating 'need' a stage further in noting that there is no requirement to demonstrate 'need'* ***provided the proposal is not for a waste disposal facility****. Where the proposal is for such an operation there is a requirement for applicants to show that it will not prejudice movement of waste up the hierarchy.*

4.3 The Technical Paper WCS-G states that large scale thermal treatment plants without energy recovery would not normally be acceptable for development. In consideration of the latterly revised Waste Framework Directive, this Living Draft document may require updating to introduce an equivalent efficiency test.

> *Technical Paper WCS-G Waste Facility Types - Living Draft - January 2008*
> *Section 2.15*
> *Large Scale Thermal Treatment*
>
> *180.* ***Large Scale Thermal Treatment plants without energy recovery would not usually be acceptable*** *except in specialised circumstances such as the destruction of clinical waste*

Recovery or Disposal

4.4 EfW plants generate electricity and heat through the thermal treatment of municipal solid waste (MSW). In the past, a decision by the Court of Justice stated that a particular EfW plant was a disposal operation because its main purpose was to treat waste, not taking into account the energy produced and exported by WtE plants, their contribution to the national energy supply, to resources savings (primary fuels savings) and the corresponding reduction of CO_2 emissions (greenhouse gases, climate relevance).

The situation was clarified by the Waste Framework Directive (WFD) 2008/98/EC [3] by including in ANNEX II a calculation formula to determine when a waste incineration installation is a recovery operation (R1) or, when it does not meet the R1 efficiency criteria threshold, a disposal operation (D10). The formula is used to check the recovery of energy from waste and its utilisation by consumers on the basis of the 1st law of thermodynamics (energy output = energy input).

In order to qualify as a recovery facility the EfW plant needs to achieve a minimum efficiency rating, known as the R1 efficiency. The Revised WFD now specifies that incineration facilities dedicated to the processing of municipal solid waste can be classified as R1, only where their energy efficiency is equal to or above:

- 0.60 - for installations in operation and permitted in accordance with applicable Community legislation before 1st January 2009
- **0.65 - for installations permitted after 31st December 2008**

4.5 The formula used to calculate this value of energy efficiency, "the R1 Energy Efficiency Formula" is:

$$\text{Energy Efficiency} = \frac{(E_p - (E_f + E_i))}{(0.97 * (E_w + E_f))}$$

In which:

E_p	The annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year)
E_f	The annual energy input to the system from fuel contributing to the production of steam (GJ/year)
E_i	The annual energy imported excluding ,E-w and E-f (GJ/year)
E_w	The annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)
0.97	The factor accounting for energy losses due to bottom ash and radiation

4.6 It should be noted that the R1 formula does not calculate a conventional efficiency but the efficiency at which the produced energy is utilised.

Estimate for the proposed EfW plant

4.7 This is an estimate based on the mid range net calorific values provided by the Entec Report prepared for GCC [4]and the publicised estimates of electrical outputs provided by Urbaser Balfour Beatty. R1 rating would subsequently be assessed using actual values once the facility was running.

Ep = 1,903,000 G/J year (based on figure of 116,000MWh/annum = 417,600G/J)
Ef = 0 - Assumes no energy input (unlikely)
Ei = 0 –Assumes no energy imported (unlikely)
Ew = 110,000 tonnes HH waste @ 9.3MJ/kg = 1,023,000GJ/annum + 80,000 tonnes C&I waste @ 11MJ/kg = 880,000G/J annum
0.97 = Losses through incinerator bottom ash

This gives an Energy Efficiency for the proposed plant of 0.588, this is below the 0.65 threshold.

This result is unsurprising as currently the plant would be electricity production only in a study by CEWEP[5] of the 83 electricity only producing plants 52 failed to achieve greater than 0.6.

4.8 As the plant currently has no heat/cooling outlet, specifically no contract to effectively take the heat, as defined in http://ec.europa.eu/environment/waste/framework/pdf/guidance.pdf, this proposal represents a disposal option rather than a recovery option. Unless heat is recovered, and the site has "a limited demand for a retrofitted heat network", the situation is likely to remain.

[4] http://www.gloucestershire.gov.uk/CHttpHandler.ashx?id=44690&p=0 Renewable Energy Study Phase 2 Resource Assessment 2011
[5] CEWep Energy Report III

5.0 Hazardous Waste Production

5.1 The Environmental Statement submitted in support of the Application refers to production of Air Pollution Control residues at a rate of approximately 1 tonne per hour. The Application refers to a standard operating year of 8,000 hours. Therefore the conclusion is that approximately 8,000 tonnes per annum of APC residues will be produced. The planning application indicates that all of this waste will be landfilled. The proposed UBB design has allowed for 25T/day of APC storage providing an annual capacity of 9,125 Tonnes. This suggests that more than the 5,500-6,500 quoted in other areas of the documentation will be produced.

> *GLOUCESTERSHIRE RESIDUAL WASTE PROJECT*
> *ENVIRONMENTAL STATEMENT – VOLUME 1 - JANUARY 2012*
>
> *Air Pollution Control (APC) Residues*
>
> *5.3.35 APC residues comprise fine particles of ash and residue from the flue gas treatment process, which are collected in the bag filters. It is estimated that the operations would generate approximately 1 tonne of APC residues per hour which equates to approximately 4% of the overall volume of the waste managed at the site. APC residues would be stored in a silo adjacent to the flue gas treatment facility. The residue APC silo has a capacity of 250 tonnes, which is sufficient for approximately 10 days storage, although at normal operating conditions only 10% of this capacity is generally used prior to export off site.*

5.2 The Landfill Directive states that both the quantity and hazardous nature of waste intended for landfill should be reduced.

> *Landfill Directive (1999/31/EC) (LFD)*
> *LFD Recital 8*
> *(8) Whereas both the quantity and hazardous nature of waste intended for landfill should be reduced where appropriate;*

5.3 Household waste has a hazardous content of approximately 0.5%. For 190,000 tonnes, this represents 950 tonnes of hazardous waste. Production of 8,000 tonnes of APC represents an 8 fold increase in hazardous waste, contrary to Directive. When capacity in other EfW facilities already exists for processing this waste, the additional quantity of hazardous waste produced is wholly avoidable.

5.4 APC residues can only be landfilled under a Waste Acceptance Criteria derogation. The Strategy for Hazardous Waste Management in England seeks to remove this derogation which will result in a requirement for additional treatment of the waste, and increased disposal cost

> *Strategy for Hazardous Waste Management in England*
> *A policy document issued by DEFRA - March 2010*
>
> *Principle 6 – End reliance on the use of Landfill Directive waste acceptance criteria derogations*

The practice of relying on higher Landfill Directive waste acceptance criteria (derogation for 3x WAC) to enable hazardous waste to continue to be landfilled must end.

Legal basis and policy drivers
48.
The Council Decision establishing the waste acceptance criteria (2003/33/EC) provides for derogations for up to three times WAC for specific parameters, notably heavy metals and some salts. Defra and EA have stated that use of such derogations is temporary, and that reliance on them should be phased out over time (statement of 23 July 2008). This principle echoes that policy position.

49.
Continued use of the derogations is a disincentive to alternative treatment being put in place and continues to encourage the landfilling of hazardous waste, which is contrary to proper application of the waste hierarchy.

Practical application

50.
There are currently five, three times WAC derogations in force for the following types of wastes: bottom ashes, fly ashes, slags, sludges, treated residues from APC conditioning and some filter cakes.

5.5 Facilities exist for the recycling of APC residues which the proposal has not considered.

Strategy for Hazardous Waste Management in England
Annex 2
Updated Summary of Facility Needs for Hazardous Waste Management in England
The priority needs by waste stream are as follows:

• A number of different treatment options exist for APC residues. Treatments that are able to make use of the resources in the waste through recycling and recovery are higher up the hierarchy than waste disposal operations. There is a need therefore for at least five facilities that can recycle APC residues to other materials that can be re-used, each with a capacity of 33,000 tonnes per annum, and a significant number of additional facilities may be needed if further EfW plant are developed. Other treatments for APC residues, which simply enable the waste stream to meet Landfill Directive requirements are lower down the hierarchy.

5.6 Policy document "Strategy for Hazardous Waste Management in England" 2010 confirms the requirement to treat hazardous waste in accordance with the waste hierarchy.

A Strategy for Hazardous Waste Management in England

Principle 1 – the waste hierarchy
a. Hazardous waste should be managed by waste producers and waste managers in accordance with the EU waste hierarchy. The hierarchy shall apply as a priority order in line with the Waste

Framework Directive (2008/98/EC):
*a.**Prevention***
b.Preparing for re-use
c.Recycling
d.Other recovery, e.g. energy recovery and
e.Disposal.

***Prevention** includes measures that reduce the adverse impact of hazardous waste on the environment and human health and reduce the content of harmful substances in materials and products before they become waste, **as well as a reduction in the quantity of hazardous waste produced**.*

5.7 The Strategy specifically refers to process residues.

18.
Figure 1 shows the waste hierarchy for hazardous waste management as supported by the principles, with waste prevention at the top and disposal at the bottom. Certain processes in the hierarchy can produce residues, which in turn should be managed in accordance with the hierarchy.

5.8 DEFRA guidance advises on best practice for waste treatment options in order to rise up the waste hierarchy from landfill.

Guidance on applying the waste hierarchy to hazardous waste - November 2011
B.1 Gas treatment residues (for example air pollution control residues, APCR)

Summary
There are options that lead to 'other recovery'. Therefore consider whether the gas treatment residues can be treated to produce a material that can then be used in an 'other recovery' operation as a replacement for a raw material.

Where the contamination of the waste justifies not treating the waste for 'other recovery' purposes, disposal and landfill can be considered. Where the waste meets the requirement for disposal in a salt mine the waste may go directly to that landfill site. For other landfills the waste is likely to require some form of treatment to fulfil the hazardous waste landfill WAC. In this case, where possible, the operator of the treatment process should consider making use of the stabilisation/solidification and neutralisation capacity of the material, which has the potential to replace raw binder materials used in treatment such as cement (in for example stabilisation treatment) or sodium hydroxide or lime (in for example neutralisation / precipitation treatment).

5.9 Although reference is made by UBB to opportunities for treating the APC residues that would comply with the waste hierarchy, no information has been provided as to how this will be done.

5.3.36 Due to the alkaline nature of the APC residues, they are classified as hazardous waste (in much the same way as cement). The APC residues would be transported offsite to a Permitted Hazardous disposal facility, alternatively the residues may be taken to an appropriate treatment facility where, for example, they could be re-used in the stabilisation of acid wastes or used in

cement manufacture.

Guidance on Applying The Waste Hierarchy to Hazardous Waste DEFRA Nov 2011.

Appendix B.1 Gas treatment residues (for example air pollution control residues, APCR) Recycling

Gas treatment residues contain mineral components that can be treated for use in construction. These include compounds of calcium in the form of calcium hydroxide and calcium carbonate, silica, aluminium and iron. Facilities exist and processes are being continually developed to recycle thermal residues into products.

5.10 The application does however refer to disposal capacity at a site near Peterborough

5.3.37 At the time of submission, UBB were in consultation with Augean Plc, a specialist waste management company suitably licensed to accept APC residues. ***This company has been identified as the preferred operator to accept the APC residues from the site.*** *A letter of support from Augean Plc is provided at Appendix 5.2a that demonstrates this company would have the capacity to accept the material from the proposed development.*

5.11 The letter of support from Augean Plc does not represent any legal agreement. It also refers to providing a facility for the disposal of 6,500 – 7,500 tonnes pa. This is inadequate to meet the requirements as provided by UBB within the Environmental Statement.

5.12 The agreement nominates a landfill 130 miles from the proposal site which fails to comply with the proximity principle.

5.14 A hazardous waste landfill exists in Gloucestershire that would at least comply with the proximity principle. It is assumed that insufficient capacity or contractual issues preclude this landfill from being used.

Strategy for Hazardous Waste Management in England
Principle 2 – Infrastructure provision

We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and ***the proximity principle is met****.*

Legal basis and policy drivers
25.
Article 10 of the revised WFD requires Member States to ensure that waste undergoes recovery operations in accordance with the waste hierarchy *in Article 4 and without endangering human health or the environment (Article 13).* ***The revised WFD also restates the principles of proximity and self sufficiency.*** *Article 16 requires that a network of waste disposal installations is available to enable the Community as a whole to be self-sufficient in waste disposal, including hazardous waste disposal, for MS to move towards that aim individually, and* ***to enable waste to be disposed of in***

one of the nearest appropriate installations.

Principle 3 – Reduce our reliance on landfill
We must continue to reduce our reliance on landfill for hazardous waste, which should only be used where, overall, there is no better recovery or disposal option.

5.15 The nominated landfill referred to by Augean has a capacity of 249,999T with a lifespan until 2026. At 8,000 Tonnes per annum, the landfill would be able to accept all the APC hazardous residue from the proposed facility for 31 years, which is adequate for fulfilling the requirements of the proposed facility, but only if the landfill receives no other waste. It must, however, be assumed that Augean would intend to fill the void by the Permit expiration, which therefore provides only 13 years of guaranteed disposal facility in a market that is growing due to the over capacity of proposed EfW plants by 2015/16.

5.16 The Waste Minimisation Statement, a requirement of the WCS, submitted in support of the Application does not make reference to the minimisation of waste through the operational life of the facility other than in reference to office waste.

4.0 Operational Life
4.1 The SPD seeks to ensure that recycling and residual bin requirements and adequate access for waste collection vehicles and their operatives is considered when designing the proposal. Considering that the proposal comprises a purpose built waste management facility which is specifically designed to meet these requirements these elements have been suitably designed into the proposal at an early stage.

5.17 Guidance for minimising hazardous waste is provided in the Guidance on applying the waste hierarchy to hazardous waste DEFRA Nov 2011. This refers to the removal of contributors to hazardous waste content prior to combustion.

Guidance on applying the waste hierarchy to hazardous waste DEFRA Nov 2011

Prevention and reduction

Contamination of the material could be minimised by looking at input materials. For example, sorting of waste prior to incineration can minimise the potential for heavy metals to be present in the gas treatment residues. The amount of heavy metal in gas treatment residues is an important factor in further processing and can impede recovery and recycling.

5.18 Pre-sorting to removal recyclables and materials likely to contain volatile heavy metals (Waste Electrical & Electronic Equipment, batteries) would reduce the requirement for pollution control and the quantity and nature of hazardous waste produced. This would be in line with the JMWMS and WCS.

JMWMS
5.3.10 Core Objective 9: De-pollution of the Waste Stream
"To segregate and safely treat or dispose of hazardous materials from the municipal waste stream."

5.19 The recast Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU) has set high recycling rates of 85% the waste stream from 2019. Nevertheless, the remaining 15% has implications for the extent of the hazardous nature of the APC residue in regard to heavy metal content.

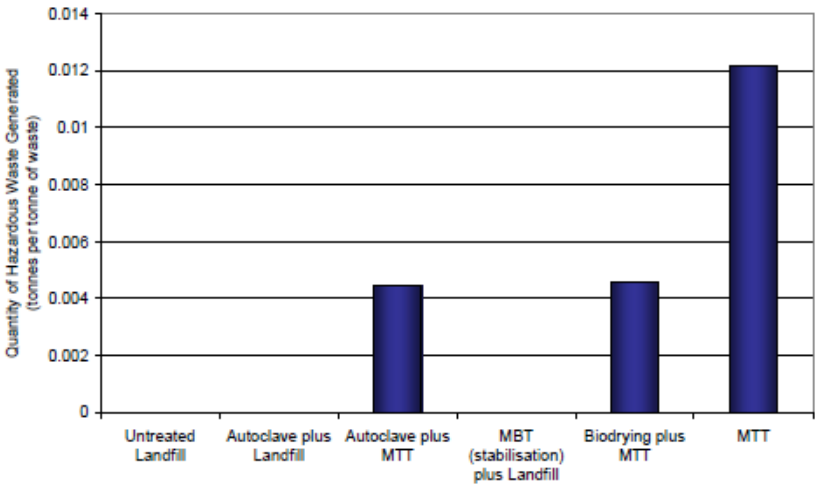
WEEE DIRECTIVE 2012/19/EU

From 2019, the minimum collection rate to be achieved annually shall be 65 % of the average weight of EEE placed on the market in the three preceding years in the Member State concerned, or alternatively 85 % of WEEE generated on the territory of that Member State.

5.20 The developers of a recovery system should include a review of existing infrastructure in the area and identify measures undertaken to comply with the requirements of the revised WFD and DEFRA guidance to minimise the amount and nature of hazardous waste . For example HWRCs and capacity for WEEE, battery/light bulb banks at recycling centres, battery banks in shops etc, and where these facilities are present, to provide promotional literature and campaigns in order to maximise their effectiveness. Remaining waste should then be treated to remove residual contamination before combustion, both to reduce the hazardous nature of the combustion residues and to facilitate the recycling of the materials extracted.

5.21 The relative productivity of hazardous waste by differing technologies is clearly illustrated in the Eunomia review of the JMWMS.

Figure 12: Hazardous Waste Generated by Different Technologies



5.22 The WCS supplementary Technical Evidence Paper WCS-G also advises that Advanced Thermal Treatment is a lower producer of hazardous waste than conventional EfW.

Technical Paper WCS-G Waste Facility Types Living Draft January 2008

Section 2.16
Advanced Thermal Treatment
(Pyrolysis, Gasification and Plasma Arc)

207. Advantages of ATT

• Because these processes take place in low oxygen conditions, the volume of process ***flue gas produced is significantly less than from incineration. Hence gas cleaning can be more efficient.***

5.23 In summary, The UBB proposal does not comply with the European Directive or associated local and UK guidance in regard to reducing the quantity and nature of hazardous waste or even the waste hierarchy in treating that waste once created. There is a significant amount of waste created from a new facility over and above that which would arise if the GCC waste arisings were treated in existing processing capacity. The disposal route identified by UBB does not comply with the proximity principle as the preferred facility identified is 130 miles distant when facility exists for its disposal locally.

6.0 Waste Separation & Recycling Inhibition

Waste Framework Directive (2008/98/EC)(WFD)

6.1 As part of its drive to increase recycling, the WFD has introduced a requirement to source segregate household and similar wastes for recycling.

> *Article 11*
> *Re-use and recycling*
>
> *Subject to Article 10(2), by 2015 separate collection shall be set up for at least the following:* ***paper, metal, plastic and glass****.*
>
> *2. In order to comply with the objectives of this Directive, and move towards a European recycling society with a high level of resource efficiency, Member States shall take the necessary measures designed to achieve the following targets:*
> *(a) by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight;*

6.2 Article 10 states that materials destined for recovery should not be mixed with other wastes or wastes of different properties.

> *Article 10*
> *Recovery*
> *1. Member States shall take the necessary measures to ensure that waste undergoes recovery operations, in accordance with Articles 4 and 13.*
> *2. Where necessary to comply with paragraph 1 and to facilitate or improve recovery, waste shall be collected separately if technically, environmentally and economically practicable and shall not be mixed with other waste or other material with different properties.*

6.3 Waste arising from municipal collections will likely have been subject to source separation in pursuance of Article 11. Whereas, wastes arising from Commercial & Industrial sources may not have undergone source separation. Mixing of sorted (treated) and un-sorted wastes (un-treated) for direct combustion would be contrary to Article 10.

6.4 The key issue is that waste that has not been previously sorted should not be mixed with waste that has, as it reduces opportunities for recovering further materials for recycling. However, the provision of an EfW facility that is out of scale with its proximity will attract all wastes, whether they have been sorted and meet a definition of residual or not, in order to meet its operating capacity requirements.

6.5 The WCS specifies a target for 80% participation in recycling by 2020. This infers that 20% of household waste will be untreated and not residual waste.

Waste Core Strategy Preferred Options January 2008

WPO1 - Preferred Spatial Vision for Gloucestershire
Sufficient waste management facilities will be provided to enable all households in Gloucestershire to recycle and compost at least 70% of their rubbish by April 2010, with an ***80% participation rate*** *by 2020.*

6.6 It is quite possible that legislation may be developed to specifically target the 20% unrecovered material in order to enforce the waste hierarchy. Article 15 provides a responsibility upon the producer to comply with the waste hierarchy. Provision of an energy recovery facility will allow a producer to comply with this article in the simplest fashion.

Article 15(1)
Responsibility for waste management

1. Member States shall take the necessary measures to ensure that any original waste producer or other holder carries out the treatment of waste himself or has the treatment handled by a dealer or an establishment or undertaking which carries out waste treatment operations or arranged by a private or public waste collector in accordance with Articles 4 and 13.

6.7 This is essentially the principle that "incineration discourages recycling" proposed by opponents to large scale conventional incineration.

6.8 This opinion is also supported within the WCS Technical Paper-G which proposes that large scale EfW inhibits recycling.

Technical Paper WCS-G Waste Facility Types Living Draft January 2008

Section 2.16
Advanced Thermal Treatment
(Pyrolysis, Gasification and Plasma Arc)

207. Advantages of ATT
• Generally plants will be smaller than incineration with energy from waste plants, and so will not inhibit recycling initiatives*.*

6.9 Definition of "residual waste" at European level would provide considerable strength to Article 10. Should this occur, over capacity will lead to increased scrutiny upon facilities failing R1 and Article 10, and their continued competitiveness.

6.10 Currently, residual waste can include:

- Wastes not targeted for separate collection
- Wastes not segregated by households and municipal C&I (low participation)
- Wastes not segregated by households (poor participation)

- Contaminated wastes (including composites)
- Residues from collection and/or sorting and/or processing (skills)
- Other wastes : contaminated wood, household hazardous
- Residual MSW + residual commercial and industrial wastes

6.11 The aim of a sustainable waste management system has to be "*to get the most energy out of genuinely residual waste, not to get the most waste into energy*".

> *Government Review of Waste Policy in England 2011*
> *Energy Recovery*
> *22 Government supports efficient energy recovery from residual waste which can deliver environmental benefits, reduce carbon impacts and provide economic opportunities. Our aim is to get the most energy out of genuinely residual waste, not to get the most waste into energy.*

6.12 Only when all efforts have been undertaken to recover recyclables and there is, no reasonable prospect of the waste being recycled or composted, does waste become "genuinely residual".

6.13 In summary, not all wastes considered residual, are. Providing a single, final disposal facility for treating residual wastes does not encourage further separation and recycling from wastes that have not been previously sorted. All wastes collected will be transported directly to the facility for treatment as residual waste without any recovery of materials for recycling. This will happen whether wastes are 'genuinely residual' or not and wastes will be treated lower down the waste hierarchy.

7.0 Process Flexibility & Value for Money

7.1 Within the Planning Application Supporting Document, there is reference to Regional Planning Guidance which states that there is an aim to avoid over reliance upon a single method or facility. It promotes a mix of waste management methods. Development of a single solution for all waste other than separated recyclables collection, fails to comply with this guidance. Rather, for Gloucestershire, it increases reliance on a single facility.

> *Regional Planning Guidance for the South West (RPG 10)*
> *Towards a Regional Waste Management Strategy*
>
> *9.27 Moving from the historic dominance of landfill in waste management in the South West to achieve the challenging targets set out above, will require a step change in waste management. There are consequently significant margins of uncertainty over the exact scale of provision of the various types of management facilities that will be proper and feasible over the next 15 years. The first aim of the interim strategy will therefore be to develop a mix of waste management methods at regional and sub-regional levels; to reduce the present reliance on landfill; and to avoid over-reliance on any other single method or facility.*

7.2 As highlighted within the Cabinet scrutiny of the Residual Waste Procurement Plan, flexibility of solution is considered a priority in managing the future sustainable waste management requirements of Gloucestershire. As has been demonstrated by changes in the LATS, PFI process, over-capacity of EfW, revision of the Waste Framework Directive and increasing stringency of performance targets in subordinate Directives, legislation will continue to change and increase in scope in regard to the challenges that are posed the waste management industry.

> *The Residual Waste Procurement Plan for the diversion of residual municipal waste from landfill: Cabinet Date 28 November 2007*
>
> *2 What is the Residual Waste Procurement Plan ("the Plan")*
> *2.1 The objective of this Plan is to procure a long term residual waste solution* ***to flexibly manage*** *Gloucestershire's residual municipal waste up to 2040.*

7.3 The PFI application document specifies a flexible solution.

> *Outline Business case for Application for Private Finance Initiative Credits.*
> *4.3.3, Specifically such capacity should:*
> - *Be a flexible solution responding to changing volumes and waste composition.*
> - *Optimize materials and energy recovery*

7.4 The proposed facility has no capability to respond to changes in legislation and targets other than to continue to accept what is delivered and dumped in the reception pit. EfW is able to accept a wide range of materials that are capable of treatment without detriment to the process rather than being flexible in respect to materials recovery. As a stand alone solution, it does not provide a capability to optimize materials and energy recovery and move up the waste hierarchy, rather it is able to treat materials that have been through processes of recycling or not.

Recovered Fuel Market

7.5 At the onset of the procurement process, markets for Solid Recovered Fuel were considered "uncertain". Currently, markets for SRF/RDF materials exist in Europe where over capacity of EfW exists in a number of countries. The same situation is likely to arise in the UK as the proposed capacity becomes operational.

> *5.6.4 GCC has a report carried to review potential Solid Recovered Fuel markets. "These discussion and the report findings conclude that the markets are still uncertain."*

7.6 DEFRA conducted a number of regional market assessments for solid recovered fuel. The assessment for the West of England and Dorset identified over 100 sites with the potential to use significant quantities, >50,000Tpa, of SRF. During the development lifespan of this project, the export of RDF has become an established market. Waste exports of RDF have risen significantly since 2008, from 0 to 272,000 tonnes per year by 2011. It is predicted to have increased significantly again in the last year.

> *Exports of refuse-derived fuel for energy recovery.*

	Tonnes
2008	*0*
2009	*1,330*
2010	*17,269*
2011	*272,200*

> *Data for 2012 has not yet been finalised, but based on provisional estimates it is expected to show a substantial increase in exports of refuse-derived fuel from 2011.*
>
> *As with other types of waste, refuse derived fuel is a commodity that can legitimately be exported, as long as this is in accordance with the requirements of the EU Waste Shipments Regulation. (Source : Associate Parliamentary Sustainable Resource Group, January 2013)*

Risk

7.7 In order to comply with the Landfill Directive (1999/31/EC) wastes must be subject to prior treatment.

> *Article 6*
> *Member States shall take measures in order that:*
> *(a) only waste that has been subject to treatment is landfilled.*

7.8 The Welsh Government is considering a ban on landfilling certain wastes. It may be possible that in order to improve waste treatment in line with the waste hierarchy, legislation as Directive is introduced that requires pre-treatment is introduced for EfW, particularly processes

that fail the R1 test and are categorised as a disposal process.

7.9 The proposed development of a conventional EfW facility, with neither facility for pre-treatment or heat use, represents significant risk of future legislative non-compliance and requirement for significant further investment.

7.10 As waste prevention initiatives and increased recycling collections are implemented, GCC risks becoming liable for making up the shortfall in waste supply to the proposed EfW plant.

> *5.5.4 Calculation of Unitary Charge.*
>
> *Table 5.1 The Base Payment is subject to a minimum tonnage provision, below which the Base Payment shall be calculated as though the tonnage of contract waste was equal to the minimum tonnage provision.*
>
> *5.5.4.2 It is therefore proposed that the Unitary Charge, will, in part be subject to indexation.*
>
> *5.5.4.3 The reference Project assumes that 50% of the Unitary Charge is indexed.*

7.11 A lack of flexibility in the GCC residual waste solution may result in a significant long term liability, which is index linked. Rather than reducing financial risk, a liability of guaranteed waste tonnages based upon dated arising figures appears to represent an increased risk.

> *UBB ENVIRONMENTAL STATEMENT – VOLUME 1 JANUARY 2012*
> *Economic and Other Benefits*
>
> *• There would also be financial benefits to the County Council (and rate payers) in terms of reducing the financial costs and risk associated with increased Landfill Tax.*

7.12 At the same time, GCC will be unable to adapt to changing legislation and increased targets.

7.13 Within the PFI application, comparison is made between potential technology solutions. For both interim and long term solutions, MBT scored highest.

> *Outline Business case for Application for Private Finance Initiative Credits.*
> *4.4.5.1*
> *Figure 4.3 Ranked Performance – Technology Performance of Long Term Solutions*
> *Figure 4.4 Ranked Performance – Technology Performance of Interim Solutions*

Highest scoring options were:

> *MBT3 Bio-drying with RDF to Dedicated (MTT/ATT with CHP)*
> *MBT4 Bio-drying with RDF to Merchant plant Facilities (MTT/ATT with CHP)*

7.14 In an environment where markets exist for Solid Recovered Fuel, whether it be short term

export or long term use within the UK or locally, the solution becomes more compelling.

7.15 At the time of the PFI application there was uncertainty in regard to a market for SRF. This uncertainty should now be dispelled by the reality of allocated PFI credits that will lead to over capacity of EfW in the UK.

Combined Heat and Power

7.16 In the comparison, EfW scores strongly, comparable to the MBT solutions, however, there is no CHP evident at Javelin Park and no proposals have been forthcoming in the 8 years since the process began. If the CHP capability is removed from the proposal for EfW, its performance scoring would appear less favourable.

7.17 The favourable comparative modelling undertaken using the assumption of CHP is irrelevant.

> *Outline Business case for Application for Private Finance Initiative Credits Approved 10th October 2007 – 5 scenarios progressed to detailed financial modelling, firstly, EfW with CHP.*

7.18 Additional benefits of MBT is that they can be smaller units and so located closer to arisings and fulfilling the many elements of the WCS quoted in regard to community vision.

7.19 Proposals should strive to make best use of heat in order to maximise efficiency. Importance of 'tri-generation' is greater than CHP as it includes electricity, heating and cooling. Cooling is often preferable to heating as it is:

- Not seasonal and therefore more flexible with year round demand
- Suitable for non-industrial uses with large scale local demand such as shopping malls, warehouses, IT centres
- Implemented with less need for complex district heating pipework.

7.20 Flexible heat use not only provides future proofing in regard to energy efficiency legislation, it will also provide further opportunities for income.

Value for Money

7.21 Modelling was also undertaken when LATS existed. MBT solutions including landfill would have had LATS cost/risk associated to the calculation and assessment.

> *4.4.6.2.3 Table 4.4. Technology scenarios identify a combination of 2xMBT + MTT within the expenditure.*

7.22 With a suggested CAPEX of £139,000,000 at 2008 prices, it must be assumed that a more

cost effective and sustainable solution can now be reached.

> *Outline Business case for Application for Private Finance Initiative Credits.*
>
> *4.4.8.10.3 The results of the modelling indicate a project CAPEX of £**139, 000,000.***

7.23 Particularly, the contract terms are indicated to include penalty clauses in regard to minimum tonnages.

> Table 5.1 The Base Payment is subject to a minimum tonnage provision, below which the Base Payment shall be calculated as though the tonnage of contract waste was equal to the minimum tonnage provision.
>
> 5.5.4.2 It is therefore proposed that the Unitary Charge, will, in part be subject to indexation.
>
> 5.5.4.3 The reference Project assumes that 50% of the Unitary Charge is indexed.

7.24 If the project is over specified by 25,000 tonnes and 50% liability indexed to inflation at 2.5% compound until 2040 at a base figure of £80. Based on 136,000 tonnes minimum this would lead to penalty payments greater than £1,000,000/annum from 2020.

Summary

7.25 It may be an opportune time for GCC to consider further, the advice procured during the development process.

7.26 GCC was committed to re-introducing technology scenarios back into the technology appraisal, if there were developments that GCC felt made the technologies more technically proven.

8.0 Review of Gloucestershire Waste Core Strategy (WCS)

8.1 It is acknowledged that the WCS is a product of extensive consultation. The aim is to move towards sustainable waste management.

> *Communal ownership and responsibility for waste is fundamental to achieving a solution. The WCS will seek to address this problem. It will set out a vision for where we want to be, and a spatial strategy to achieve it. The core principle that will underpin it is the need to facilitate sustainable waste management in the County.*
>
> *The aim is to move waste management practices away from landfill towards more sustainable methods of waste management and resource recovery by reflecting the waste hierarchy.* ***This places final disposal as the least preferred option****.*

8.2 The current EfW proposal without CHP represents final disposal as it does not meet the WFD R1 test, and is therefore the least preferred option.

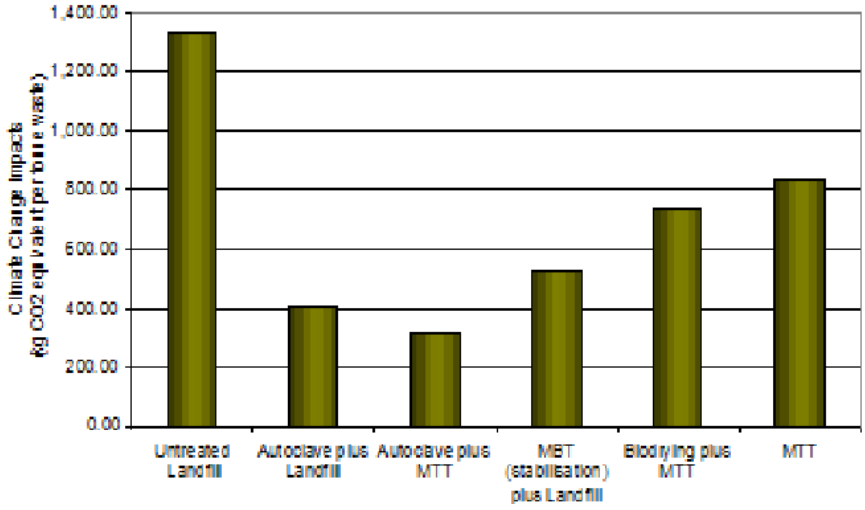
8.3 Development of an EfW plant without CHP does not comply with WCS Strategic Option 3. Additional value could be recovered through further materials recovery and improved heat use. It is also possible that advanced thermal treatment processes could be used delivering greater efficiency.

> *Strategic Objective 3 – Other Recovery (including energy recovery)*
>
> *To recover the maximum amount of value including energy from any waste that cannot be re-used, recycled or composted through the provision of the following:*
> - *Around 150,000 tonnes/year residual waste recovery capacity for municipal waste by 2027.*

8.4 Within the Final Environment Report for the Gloucestershire JMWMS, an assessment of relative climate change impact is presented. MTT (with CHP) compares poorly to other options. Therefore the development fails to comply with Strategic Option 5.

> *Strategic Objective 5 – Minimising Impact*
>
> *To* ***ensure the environmental*** *and social* ***impacts of waste management particularly climate change*** *and risks to human health* ***are minimised*** *by; managing waste close to where it arises, promoting the use of sustainable transport,*

Figure 13: Climate Change Impacts of Waste Management Options



Alternative Treatment Capacity & Sustainable Transport

8.5 Gloucestershire currently disposes approximately 90,000 tonnes per annum of hazardous waste to landfill. There is facility within Gloucestershire at the Grundons owned landfill, Permitted to treat 75,000 tonnes of APC wastes per annum prior to disposal.

Waste Core Strategy Technical Paper WCS-E Hazardous Waste Living Draft

> *A22. The waste license permits 150,000 tonnes of hazardous waste to be disposed of at the site per annum, although throughput has consistently been significantly less than this. There is also an ash conditioning plant, which handles Air Pollution Control wastes from industrial processes such as incinerators, prior to disposal onto the landfill. This is licensed to handle up to 75,000 tonnes per annum*,
>
> *Opportunity exists for Gloucestershire to back haul waste or better, SRF, to thermal treatment facilities. If the 150,000 tonnes pa of residual waste produced in Gloucestershire were treated to produce a SRF, assuming a 30% weight reduction, there is opportunity to manage the majority, if not all residual waste without significant additional transport.*

8.6 SRF via bio-drying and de-hydration results in a 30% reduction in weight due to moisture loss.

8.7 If an interim treatment solution without thermal treatment were reached, it is possible that SRF could be exported from the area for beneficial use, by water if necessary.

> *Minerals & Waste Core Strategies Joint Technical Evidence Paper WCS-MCS-1 Transport - Living Draft*
> *Section 2 Gloucestershire's Transport Network*
> *Water Bourne Transport*
>
> *20. Sharpness docks potentially has an advantage over larger docks such as Bristol, as it is cheaper for smaller operators who may be put off using larger, more expensive docks. It has the potential to service specific local needs including the transportation of minerals and waste in Gloucestershire.*

8.8 A flexibly scaled solution could allow for export of residual waste to treatment facilities in South Wales by road or water. Road transport would allow avoiding the congestion points around Gloucester[6].

8.9 Area to the south of the county could also take advantage of existing and proposed treatment plants, MBT or ATT, with the possibility of supplying heat efficiently to industrial users in Bristol/Avonmouth. A supply of local SRF may encourage facilities to be developed or converted

[6] Minerals & Waste Core Strategies Joint Technical Evidence Paper WCS-MCS-1 Transport Living Draft

in the area, in order to improve their competitiveness.