**Agenda Item No:**

**NORTH LONDON WASTE AUTHORITY**

**REPORT TITLE:**

**WASTE POLICY AND STRATEGY UPDATE**

**REPORT OF:**

**DIRECTOR OF PROCUREMENT**

| **FOR SUBMISSION TO:** | **DATE:** |
|---|---|
| **AUTHORITY MEETING** | **23 September 2010** |

**SUMMARY OF REPORT:**

This report considers six policy issues that are relevant to the Authority and that will be important issues in handling the Authority's response to policy and other developments such as the forthcoming announcements relating to the Comprehensive Spending Review. The paper also seeks Member agreement or delegated authority to submissions in respect to four current reviews and consultations.

**RECOMMENDATIONS**

The Authority is recommended to:

1. Note and comment on the analyses in section 2 of this paper in respect to maximising recycling, 'zero waste to landfill', the potential for using Anaerobic Digestion to treat organic waste, commercial waste and funding for the purposes of guiding officer work on policy and strategy reviews undertaken by Government and the Mayor (section 2).
2. Agree the draft response to the Government Revised Framework Directive consultation (section 3 and Appendix C).
3. Delegate authority to the Director of Procurement in consultation with the Chair and Vic Chairs to provide evidence in respect to the Government's Waste Policy Review (section 4 and Appendix D).
4. Delegate authority to the Director of Procurement in consultation with the Chair and Vice Chairs to provide a written submission to the GLA Assembly Recycling Inquiry (section 5 and Appendix E).

**Signed:**
**Director of Procurement**
**Date:**

13.9.10

## 1. PURPOSE AND CONTENT OF REPORT

1.1 This report considers six policy issues that are relevant to the Authority and that will be important issues in handling the Authority's response to policy and other developments such as the forthcoming announcements relating to the Comprehensive Spending Review. The paper also seeks Member agreement or delegated authority to submissions in respect to four current reviews and consultations.

1.2 The paper is supported by the following 5 appendices:

A. Background paper on Anaerobic Digestion;
B. Background note on the Stage 2 consultation on the transposition of the revised framework directive;
C. A draft Authority Response to the consultation on the transposition;
D. Review of Waste Policies, Call for Evidence (DEFRA Consultation Document);
E. Details of a GLA Assembly Inquiry into London recycling rates.

## 2. CURRENT POLICY ISSUES

2.1 On 8 September 2010 the Government announced that on the basis of provisional data the UK will meet the 2010 Landfill Directive target of reducing biodegradable waste to landfill to 75% of the 1995 level. The 2013 and 2020 targets are to reduce biodegradable waste to landfill to 50% by 2013 and 35% by 2020.

2.2 The ongoing demands for reducing the disposal of waste to landfill will be a key driver for Government and Mayoral policy work that have been announced or promised. We can highlight six policy issues that seem likely to be developed in the coming months and where consideration will need to be given to the Authority's response, taking account of the agreed Joint Waste Strategy (JWS) and the agreed reference project in the Outline Business Case (OBC). These are:

- Maximising recycling rates;
- 'Zero waste to landfill';
- The nature of fuel produced from residual waste;
- The role of Anaerobic Digestion in treating organic waste;
- The Authority's role on commercial waste; and
- Funding for waste services.

### - Summary of views

2.3 The analysis set out in subsequent paragraphs in this section suggests that the Authority should take the following approaches to national and regional waste policy and spending issues:

- Continue to support recycling and composting ahead of other treatment and disposal methods and market development that is designed to make more recycling viable. There is, however, a need

to be cautious about supporting any new Government or Mayoral policies that seek recycling performances that exceed 50% of household waste;

- Be supportive of any national and regional policy moves towards 'zero waste' to landfill providing the timescales allow for the development of new treatment capacity and the policy allows for a small residual amount of material (approximately 1%) going to landfill;

- Support a landfill tax approach to delivering zero waste to landfill providing the funding generated in the medium term is used to support more sustainable waste solutions and does not become a new burden on local council taxes;

- Continue to argue that Solid Recovered Fuel (SRF) with a biomass content of 50% - rather than 90% - should be used for measuring regional self-sufficiency targets;

- Encourage waste policy to recognise the contribution of composting in treating garden waste as of equal merit to Anaerobic Digestion.

- Support any national policy development in respect to a local authority role on more sustainable waste management solutions for commercial waste that is properly funded and does not give rise to additional costs for local council taxpayers particularly in terms of the provision of treatment capacity.

- Encourage Government to protect existing PFI credit allocations to support capital expenditure on new diversion capacity. Seek greater transparency in relation to RSG allocations for waste management; and encourage RSG allocations relating to waste management that reflect the higher costs incurred in densely populated urban areas.

2.4 The Authority is recommended to note the analyses and agree that these policy and funding approaches are adopted in contributions to policy development and communications related to policy and funding.

**- Maximising recycling rates**

2.5 The waste hierarchy adopted in European and national policy frameworks identifies recycling and composting as preferable to either energy from waste (EfW) or landfill. Current Government policy sets a national target of 50% household waste recycling and composting by 2020, the Mayor's consultation on a London waste strategy identified the possibility of a 60% target for municipal (i.e. including both household and non-household waste collected by local authorities) waste recycling and composting and the administrations in Scotland and Wales have set a 70% recycling ambition.

2.6 At a local level North London authorities have agreed a JWS that includes a recycling ambition of 50% household waste recycling and

composting by 2020 and this is reflected in the reference project contained within the Outline Business Case for the procurement. The adoption of a 50% recycling ambition was an important part of securing PFI credit support from Government to the Authority's procurement and progress towards its achievement remains a key concern for DEFRA and the Authority.

2.7 The JWS also set intermediate targets on recycling of 35% by 2010 and 45% by 2015 so as to achieve 50% by 2020. Against the 2010 target, the 2009-10 recycling performance in North London was 29%. Nationally the recycling rate was 37.6% in 2008-09; full year results for 2009-10 are not yet published although it is expected that there will be a further small increase in national recycling rates.

2.8 All analyses relating to collection systems suggests that a 50% recycling rate for North London is very challenging and can only be secured by maximising the contribution to recycling performance by significant enhancements to collection systems, significantly improving Household Waste and Recycling Centres (HWRCs) and securing a further contribution to recycling performance from residual waste treatment. As set out in section 2.5 in the OBC, there are two significant issues that are likely to mean that North London may not be able to achieve the same recycling rates as are achievable nationally:

- Green waste is a smaller proportion of the household bin in North London than nationally arising from a relatively low number of private gardens which tend to be of a relatively small size. Recent composition work identifies that green waste is 10.22%[1] of household waste in North London compared to 20%[2] nationally;

- The small proportion of properties with sizeable gardens and a large and growing proportion of flatted properties (including high rise apartments). For example Camden, Hackney and Islington's proportion of flatted properties is 86%, 80% and 76%. The national average proportion of flatted properties is 19%.

2.9 Whilst the Authority should continue to support recycling and composting ahead of other treatment and disposal methods, and support market development that is designed to make more recycling viable, it should be cautious about supporting any new Government or Mayoral policies that seek recycling performances that exceed 50% of household waste.

**- 'Zero waste' to landfill**

2.10 This policy intention is an emerging theme in a number of policy statements, including in recent Government commentary. The policy can seemingly mean different things in different contexts: in Scotland it

[1] North London Waste Authority, Waste Composition Analysis Project for NLWA, Final Interim Report, ENTEC, August 2010.
[2] Dr Julian Parfitt, WRAP. Analysis for 'Waste not, Want not' 2002, available at http://www.defra.gov.uk/evidence/statistics/environment/wastats/bulletin09.htm

has previously been interpreted as a maximum of 5% of waste to landfill. In Wales it has been interpreted as minimising the amount of waste that goes to landfill with a presumption in favour of recycling and with an expectation that the vast majority of residual waste that cannot be recycled will go to high efficiency Energy from Waste plants. Both Scotland and Wales have previously supported their 'zero waste to landfill' policies with a 70% recycling target/ ambition.

2.11 Beyond any policy, a key consideration for the Authority is the availability of landfill within a reasonable travelling distance. A precise assessment is difficult given that it is partially dependent on the extent to which the private sector invests in developing new void capacity, but a number of commentators have identified that there is a prospect of available landfill capacity in London and the South East being used up in 5-7 years. At that time, material for landfill will need to be transported greater distances, increasing costs as well as providing a poorer environmental solution.

2.12 The Authority's procurement is designed to meet landfill allowance targets, including reducing the volume to 35% of 1995 levels by 2020. The reference project within the OBC did however assume that a volume of material continued to be landfilled as follows:

| | **2020** | **2045** |
|---|---|---|
| **Waste direct to landfill (tonnes) including;** | **17,268** | **22,505** |
| - rejects from windrow composting | 546 | 619 |
| - rejects from MRF | 4,430 | 4,898 |
| - rejects from AD | 6,381 | 7,183 |
| - MBT residue | 95,376 | 104,482 |
| **Process residues/rejects (active) (tonnes)** | **106,733** | **117,181** |
| **Bottom ash to landfill (inert) (tonnes)** | **6,628** | **7,260** |
| **Fly ash land filled (active) (tonnes)** | **11,782** | **12,907** |
| **Total landfilled (tonnes)** | **142,411** | **159,854** |

2.13 One alternative to the landfilling of this material is incineration together with the vitrification of the fly ash produced from the incineration process. The annual gross cost of adopting this approach – illustrative of what a 'zero waste to landfill' policy might mean - is £15.3m in 2020 and £17.1m in 2045. At the same time, depending on timing, there will be significant offsetting savings in the cost of landfill and the value of the existing EfW plant at Edmonton is likely to be boosted if there was a policy move towards a zero waste to landfill. Overall, such a policy is likely to be broadly cost neutral for the Authority if the approach is developed over several years and appropriate facilities are available for the Authority to access. The exception is in respect to the treatment of fly ash where due to its toxicity there will be high costs for the foreseeable future.

2.14 The Authority may therefore want to be supportive of any national and regional policy moves towards 'zero waste' to landfill providing the timescales allow for the development of new treatment capacity and

the policy allows for a small residual amount of material (for example, fly-ash which can only be disposed of expensively), which amounts to approximately 1%, going to landfill.

2.15 The mechanisms available to Government to deliver any 'zero waste' to landfill policy include:

- Regulation that bans the landfilling of certain types of waste from a pre-determined date – this could be applied to untreated waste, 'active' waste, or particular types of waste – e.g. kitchen waste;
- A continuation and extension of the landfill allowances framework;
- A continuing use of the landfill tax framework;
- More demanding requirements for the recovery of packaging by producers of goods;
- A combination of two or more of these approaches.

2.16 A regulatory approach is a blunt instrument that does not allow for detailed judgements about the extent to which different approaches could sensibly be adopted on diversion. It is also an approach that Government does not appear to be favour. On the 8 September 2010, the Government published a response to a consultation on the possible introduction of bans on the landfilling of certain wastes. The Government has concluded that "it is not minded to introduce further landfill restrictions in England at this stage, but will consider how best to make progress towards the objectives of zero waste to landfill as part of the Review of Waste Policies, due to conclude in Spring 2011".

2.17 As an approach that is applied only to the public sector, landfill allowances have the potential to disadvantage any public sector support on the diversion of commercial waste from landfill as local authorities must recover the full costs of managing commercial waste including any provision for landfill allowances. It may also leave public authorities with a potential liability that it is not well placed to manage. A landfill allowance approach does not appear to work well unless it is equally applied to private sector waste management operations.

2.18 The packaging recovery system potentially reduces the burden on local taxpayers associated with waste disposal costs and transfers it to consumers. It also encourages the producers of goods to fully explore market development and design work to re-use recycled materials. The Authority should encourage Government to fully explore the contribution that this system can make to securing minimal landfill.

2.19 Landfill taxes are a proven means of achieving progress towards minimal landfill and a clear Government signal of increasing landfill taxes in real terms beyond 2014-15 of a similar amount to that proposed for the period up to 2014-15 – taking landfill tax to around £120/ tonne by 2020 would be sufficient to deliver the policy intent as it would make many treatment processes more economical than landfill. The difficulty with this approach is that Government have moved away from using the funding generated by higher landfill taxes to support more sustainable waste solutions and the infrastructure that is required. The Authority may

want to support a landfill tax approach to zero waste providing the funding generated in the medium term is used to support more sustainable waste solutions and the move to a zero waste to landfill does not impose a new burden on local authorities and consequently on local council taxes.

- **The definition and use of Solid Recovered Fuel**

2.20 Section 4 of the OBC sets out that the Authority considers that the production of a refined and stabilised Solid Recovered Fuel (SRF) from waste that cannot be recycled or composted, and its use in efficient energy production, is likely to be the optimum environmental and cost solution. The Authority's agreed procurement strategy is to secure the optimum fuel use solution in environmental and cost terms wherever this is located and, if necessary, supported by sustainable transport solutions involving rail and/ or water transport. The fuel specification that the Authority has drafted with a view to minimising landfill and maximising the energy recovery includes an expectation that there will be a 50% biomass content.

2.21 The Authority's approach is supported by Government as a good means of securing the efficient energy contribution that is potentially available and a key market development. The fuel specification is also consistent with approaches that have proven to be environmentally and cost effective in other local authority procurements, most notably in Greater Manchester.

2.22 The Mayor's consultations on the London Plan and the Mayor's Waste Strategies are generally supportive of and consistent with the Authority's procurement. There is, however, a tension in respect to SRF where the Mayor's draft strategies say that for the purposes of meeting self sufficiency targets, "waste is deemed to be managed in London if it is solid recoverable fuel (SRF) produced in London, provided the SRF is a 'biomass fuel' as defined in the current Renewable Obligation Order". This definition of SRF includes a minimum 90% biomass content. If this provision remains in the final version of the London Plan and the Mayor sought to enforce this provision there may be increased difficulty in exporting SRF with a biomass content of less than 90% outside of London.

2.23 The Authority identifies that the biomass fraction in North London's waste (including paper, card and textiles) constitutes around 66.1%. The Mayor's approach to SRF export from London could therefore only be achieved if:

- The volume of fuel that is made available and the energy need that is met are significantly reduced; and
- Other treatment facilities – most obviously incineration - are available in London to take the non-biomass material (plastic film, contaminated dense plastics etc) and these were operated with no financial support derived from energy recovery from biomass material.

This would be a poor environmental and cost outcome.

2.24 Earlier in the year, Members approved the Authority's submission to the draft London plan including the Authority's view on the definition of SRF. The Authority argued that it is seeking to produce SRF with a minimum biomass content of 50% (which coupled with good quality CHP should achieve Renewable Obligation Certificates), that a 50% biomass SRF produced in London should be deemed to be 'managed in London' and that with this change the production of SRF would make a positive contribution towards the achievement of self-sufficiency targets.

2.25 Officers subsequently attended the examination in public of the draft replacement London plan and reiterated the Authority's views on the definition of SRF. As a result, the Authority has been invited to provide further evidence to demonstrate why SRF with a minimum biomass content of 50% would make a positive contribution towards the achievement of self-sufficiency targets and officers will pursue the invitation from the Inspector. The intention is to continue to seek a consistency in the Mayor's plans with the Authority's procurement approach.

- **The role of Anaerobic Digestion in treating organic waste**

2.26 The recently published DEFRA 'Guidance on Applying the Waste Hierarchy' includes a summary table of the options for treating different waste streams organised in terms of 'smallest to largest' environmental benefit. For both food and garden waste the document details the order of preference from an environmental benefit perspective as: - Waste prevention – Anaerobic Digestion (AD) – Composting - other energy recovery technologies – Landfill. Taken together with the Coalition's 'Programme for Government' which highlighted an intention to see a substantial increase in Energy from Waste through Anaerobic Digestion, there seems every prospect of new Government policy that is highly supportive of AD.

2.27 The analysis of the environmental benefits of AD was anticipated by the Authority's OBC and reference project. This placed significant emphasis on AD for source-separated material and in adopting AD as a form of biological treatment for residual waste in Mechanical Biological Treatment. The total amount of waste that is estimated to go through all AD facilities is approximately 350,000 tonnes per annum.

2.28 However, officers have some concerns – set out in Appendix A - about the ability of AD to treat all organic waste. In particular, that AD is not necessarily the best treatment process for garden waste, in particular the woody elements. The Authority may wish to encourage Government policy to recognise the contribution of composting in treating garden waste.

- **Waste Disposal role on commercial waste**

2.29 The Authority's function and procurement are focused on municipal waste which has traditionally covered household waste and non-household that Boroughs collect. There is approximately 140,000 tonnes of this non-household waste in the Authority's waste flow that is managed and the Authority's OBC and procurement address treatment of this volume.

2.30 Municipal waste is being redefined to also include commercial waste which is similar to household waste. Currently this is simply a classification issue which is not anticipated to impact on the responsibilities of local authorities to deliver a disposal solution or to be subject to the current landfill allowance trading scheme.

2.31 There seems every prospect that Government policy will be developed with a view to providing a more sustainable waste management solution for commercial waste. If it does so, it will be important that any local authority role or responsibility on commercial waste is developed with proper funding and with no risk to local council taxpayers in terms of the provision of treatment capacity. The Authority may wish to seek to ensure that Government policy is developed with that view in mind.

- **Funding for waste services**

2.32 The forthcoming Comprehensive Spending Review announcement which is due to be announced around 22nd October 2010 has been previewed to be a tough settlement for all local government expenditure.

2.33 As far as waste management expenditure is concerned there is no reason to believe that landfill tax rates will be pushed further than the already announced £8/ year increase to £80/ tonne in 2014 (compared to £48/tonne today and £8/tonne on introduction on 1st October 1996) However, there is also no grounds for optimism that the increased income to the Exchequer that arises from landfill tax will be re-circulated to local authorities and others who pay the increased tax charges. Across local government spending on waste there are also potentially increasing cost pressures arising from Government policy on weekly collection and policy initiatives that are designed to achieve environmental ambitions other than through funding new approaches.

2.34 DEFRA and DECC budgets are of particular interest to the Authority as these Departments fund the waste and energy initiatives that are of most interest to the Authority. The budgets of these Departments were not ring-fenced from cuts by the current Government and there are good prospects of significant cuts. At the same time, there is no reason to think that the new burden imposed on local authorities arising from increasing landfill tax will be funded or that the funding will be re-distributed to local authorities to fund investment in alternatives to landfill. A particular risk for the Authority may arise if Departments are made responsible for all capital spending within their policy area and other DEFRA responsibilities such as flood defence work are cut back

significantly – it may be very tempting for DEFRA Ministers to see existing waste PFI credit allocations as providing some scope to help meet other departmental priorities and accordingly reduce the final PFI award allocated to the Authority.

2.35 Whilst the Authority has a particular interest in seeing Government support for capital expenditure on waste disposal facilities, it should not lose sight of the fact that the majority of Government support for waste management services is provided through the spending allocation to Environment, Protective and Cultural Services (EPCS) spending block which determines the Revenue Support Grant (RSG) distribution. The distribution of waste management funding in this way means that the relevant RSG is bundled together with support for services such as libraries which themselves may be subject to significant cuts at the same time as new burdens are placed upon local authorities in respect to waste management. This may add further pressure on funding waste management where spending at a local level probably already exceeds Government expenditure expectations.

2.36 One of the effects of the bundling of services into the EPCS block is that waste management resources are allocated on a funding formula that does not take account of cost drivers in relation to waste management. The Authority faces significant challenges in delivering sustainable waste management services in a densely populated and congested area. It would be appropriate for the appropriate RSG allocation to reflect the costs burden that such urban areas incur.

2.37 Overall, it would be in the Authority's interest to see protection for existing PFI credit allocations to support capital expenditure on new diversion capacity, greater transparency in relation to RSG allocations for waste management and RSG allocations relating to waste management that reflect the higher costs incurred in densely populated urban areas. The Authority may wish to promote these views in responding to the Government's Waste Policy Review and any Comprehensive Spending Review announcements.

## 3. REVISED WASTE FRAMEWORK DIRECTIVE CONSULTATION

3.1 Appendix B contains a background note on the transposition of a revised Waste Framework Directive into law and an officer assessment of the implications.

3.2 A stage one consultation on the transposition was carried out in July-October 2009 to which the Authority responded (Authority meeting 25th September 2009). The current consultation is the second stage of the consultation on the transposition of the rWFD into England and Wales. The consultation includes a draft of the Regulations necessary and draft guidance on applying the waste hierarchy.

3.3 The deadline for responses to the consultation was 16 September. Accordingly an 'officer' response has been submitted with the response being subject to Member approval at this Authority meeting.

The Authority is recommended to approve the response to the consultation at Appendix C.

## 4. DEFRA WASTE POLICY REVIEW

4.1 On 15th June DEFRA announced that the Government would be undertaking a full review of waste policies in England. A call for evidence closes on 9 October 2010.

4.2 Appendix D contains the full DEFRA consultation document.

4.3 The Authority is recommended to delegate authority to the Director of Procurement to respond to the Government's call for evidence in respect to the Government's Waste Policy Review in consultation with the Chair and Vice Chairs and taking account of the Authority's consideration of key issues (see section 2).

## 5. LONDON ASSEMBLY INQUIRY INTO RECYCLING PERFORMANCE

5.1 The Environment Committee of the London Assembly has agreed a proposal for an inquiry into 'Why do recycling rates vary so widely across London?' The inquiry aims to contribute to understanding on why recycling rates vary so widely across London. Further detail is provided in Appendix E.

5.2 Statutory waste disposal authorities such as the NLWA are listed as stakeholders who will be invited to contribute to the inquiry either in writing or at meetings led by the rapporteur. The published timetable is for written views and data, desk based work and rapporteur led stakeholder meetings to take place between August and October 2010. Findings are anticipated to be published in February 2011.

5.3 The Authority is recommended to delegate authority to the Director of Procurement to provide a response to the inquiry in consultation with the Chair and Vice Chairs.

## 6. LEGAL ADVISER COMMENTS

6.1 The Legal Adviser has been consulted during the preparation of this report and all comments have been incorporated into the report.

## 7. FINANCIAL ADVISER COMMENTS

7.1 The Financial Adviser has been consulted during the preparation of this report and has no comments to add.

**Local Government Act 1972 – Access to information**

**Documents used:** The London Plan, Spatial Development Strategy for Greater London, Consultation draft replacement plan, Mayor of London, October 2009

Stage Two: Consultation on the transposition of the revised Waste Framework Directive (Directive 2008/98/EC), A consultation document issued jointly by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government, July 2010

Consultation Draft, Guidance on Applying the Waste Hierarchy, Defra, July 2010

Review of Waste Policies, Call for Evidence, Defra, July 2010

Rapporteur Inquiry Proposal – Why Do Recycling Rates Vary So Widely Across London? Report Number 11, Greater London Authority, London Assembly, The Environment Committee, 15 July 2010

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# APPENDIX A

## BACKGROUND NOTE ON ANAEROBIC DIGESTION

The purpose of this paper is to provide additional information on anaerobic digestion and its application to the NLWA's procurement.

### Anaerobic Digestion

Anaerobic Digestion (AD) is a biological method of treating waste. Bacteria decompose the wastes in the absence of air, in contrast to composting where wastes are decomposed by micro-organisms in the presence of air. Although anaerobic digestion occurs naturally in oxygen free environments such as within under-water sediments or within landfill sites, the term anaerobic digestion (AD) is normally used to describe an artificially accelerated operation in closed vessels at special plants. Sewage sludge and agricultural waste has been treated by anaerobic digestion for many years, and the process is now being used for municipal solid waste.

### What are the technologies?

Anaerobic digestion can be used to treat sewage sludge, agricultural waste, kitchen waste, garden waste, and biodegradable fraction of MSW. MSW is often mixed with other organic wastes (such as agricultural waste or sewage sludge) when treated using AD systems to increase gas generation potential and utilise spare capacity.

The waste is delivered to the plant and is initially sorted mechanically to remove remaining non-biodegradable contaminants. This may involve screens, air classifiers or magnets. The organic waste is then shredded and mixed with water and pumped to an enclosed vessel where it is heated, stirred and held for up to three weeks whilst the bacteria digest the waste and emit a gas (biogas) consisting of about two thirds methane and one third carbon dioxide. After this the solid digested material is pressed to recover the added water. The solid digestate is placed in piles to aerate for about two weeks. Once the digestate has been aerated it can be used as a soil improver or growing media constituent in the same way as compost. If the material is derived from mixed wastes sources additional sorting may be required to remove contaminates. The liquid fraction can be recirculated in the process but some excess is generated and depending of the feedstock this can be used as a fertiliser or if the waste is contaminated it has to be disposed of to sewer.

The gas that is generated after simple cleaning to remove hydrogen sulphide and water can be burnt in gas engines to generate electricity or in boilers to produce steam. Alternatively in some locations it can be economic to purify the gas by removing the carbon dioxide so that the gas can be used to fuel vehicles such as cars, busses or lorries, or the purified gas can be piped in to the natural gas network.

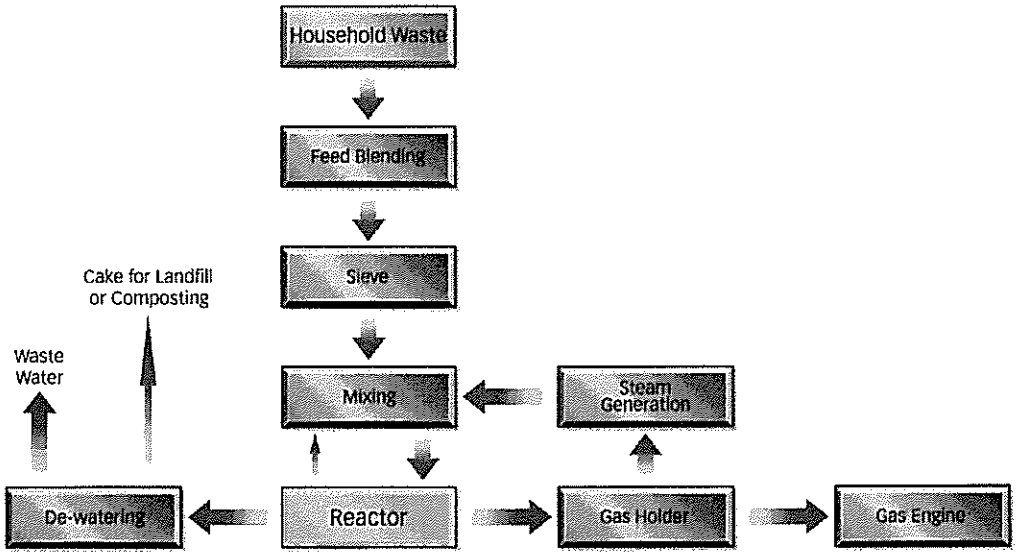


Figure 1 - Generalised Process Flow Chart for Anaerobic Digestion

## Feedstocks

The economic viability of AD treatment in part is dependent on the size of the AD plant in relation to the rate of biogas production. Therefore, correctly sized facilities (according to feedstock) with higher biogas production rates are preferable. Most AD plants are viable if they produce sufficient biogas within a 15 -20 day residence time, with feedstock biodegradability having major impact.

Ideally, a feedstock that degrades rapidly at a high rate under anaerobic conditions and to a high extent (i.e., high percentage of organic matter decomposed) of degradation is most desirable. This is typical of most organic matter that is not composed of significant amounts of woody type materials, including most food wastes and animal products such as abattoir wastes.

Because green waste usually contains significant amounts of woody material, and it is only the leaf material that is degraded at high rates, it is often discouraged as a feedstock for AD. Overall, the rate of decomposition and extent of decomposition for green waste are both less than that of food waste. The following data from biodegradation tests illustrates this.

The DR4 test measures the initial rate of biodegradation and the BMc test the extent of degradation. Example data shows how the degradation rate and extent of degradation for green waste is much lower than for food wastes such as pizza waste and fish waste (indicated by a lower "Loss on Ignition" - LOI value).

- Greenwaste DR4 = 108 g O/kg LOI, BMc = 182 l/kg LOI
- Pizza waste DR4 = 226 g O/kg LOI, BMc = 748 l/kg LOI
- Fish waste DR4 = 170 g O/kg LOI, BMc 457 l/kg LOI

So it can be seen food wastes may degrade at least twice as quickly as green waste and to more than twice the extent. This makes economic rates of biogas production feasible from wastes. In relation to organics collections, this means that it is preferable to have separate food waste and greenwaste collection schemes as the inclusion of garden waste containing high quantities of woody material would result in the requirement for larger facilities with sub-optimal biogas yields. Accordingly, it is preferable and more economical to send greenwaste containing woody material to a conventional composting process.

## What are the products?

Anaerobic Digestion of MSW has three products:

**Biogas** – has the same potential as any other combustible gas, e.g. in gas engines to generate electricity, however the cost of piping the raw gas can be prohibitive. Alternatively the gas can be upgraded to a suitable quality to fuel vehicles or to be added in to the natural gas pipeline.

**Liquid** – The liquid effluent contains a large proportion of the nutrients from the waste and can be used as a fertiliser. However, many countries prohibit the use of this fraction and hence it must be disposed of either by further aerobic treatment or disposal via the sewage system.

**Solid Digestate – Compost** – The solid digestate is the other product of anaerobic digestion and this can be used as compost after further aerobic treatment and maturation. However, if this material is contaminated (particularly with heavy metals) the use of this material may be limited - or precluded by legislation. This means that source segregated feedstock material and output quality must be carefully monitored to ensure that relevant requirements (PAS100, PAS110, and/or Animal By-Products Regulation).

## Is the technology established?

AD is a well established technology for industrial wastewaters sewage sludge or agricultural wastes. Its use for municipal solid waste outside of landfill (essentially a large uncontrolled digestion plant) is becoming more widespread with the majority of facilities processing source separated biowastes (kitchen and garden waste). However, increasingly AD is being adopted for the biological part of MBT processes. A survey in 20003 found over 165 plants operating or in construction and subsequently more plants have been developed In the UK, AD development has been more limited with only a few small pilot plant facilities for kerbside collected biowaste although there have been facilities for industrial and agricultural wastes. The largest use of AD for MSW is the Leicester MBT facility that processes the organic fraction from Leicester's waste, with the digestate being mixed with sewage sludge to be applied to agricultural land.

## Advantages and disadvantages

## Advantages

- Less biological sludge produced with lower nutrient demand than untreated organic waste.
- Renewable energy production which gives rise to greenhouse benefits from displacement of fossil fuels and avoided methane emissions.
- Biomass acclimatisation allows most organic compounds to be transformed with rapid response to substrate addition after long periods without feeding.
- When used as part of an MBT process, AD has the advantage over in-vessel aerobic composting as it produces a bio gas product.
- The biogas produced during this process can be sold as a fuel or combusted. The sale of any electricity generated will be eligible for Renewables Obligation Certificates (ROCs). The production of heat may be used for processing heating requirements with potential financial benefits (RHIs).

## Disadvantages

[3] IEA Biogas and more, System and markets overview, July 2001, AEA Technology

- Digestate often requires further treatment with an aerobic treatment process to meet discharge requirements.
- Sensitivity to adverse effect of lower temperatures on reaction rates and may therefore require heating to achieve adequate reaction.
- Less stable after "toxic shock" (e.g. after upsets due to toxic substances in the feed).
- Increased potential for production of odours and corrosive gasses.
- Some apprehension in the UK over investing in AD as a result of some poor past performance and operation resulting in odours and poor quality products.
- The biodegradability of the digestate produced will now have to be measured and assessed on a plant by plant basis. It is likely that only 50% reduction will be achieved.
- End-product standards (PAS100, PAS110) and outlets for AD digestate from mechanically separated MSW are not guaranteed. Currently the Environment Agency has indicated that mixed waste composts and digestates are unlikely to be of an appropriate quality to be applied to agricultural land.

### What are the costs?

Within the OBC, a capital cost of £15.3M was projected for a 112ktpa facility along with £236.2M for 585ktpa of MBT/AD capacity). Gate fees are typically £50-90/tonne (median £57/t – WRAP 2010) which is in line with the Authority's projected figure of ~£60/t.

Anaerobic digestion plants are typically combined with other processes (such as MBT) and are used to treat the biodegradable fraction of any waste. AD plant size is very flexible as they are modular and can essentially be any size, units range from 10ktpa up to 70ktpa depending on supplier.

## APPENDIX B – STAGE TWO CONSULTATION ON THE TRANSPOSITION OF THE REVISED WASTE FRAMEWORK DIRECTIVE

### Background Note on Key Aspects of the Consultation and Implications for the Authority and Constituent Borough Councils

Applying the new waste hierarchy to the planning system

Defra is consulting on its proposals to apply the new waste hierarchy to the planning system. Consideration of the waste hierarchy is already part of strategic spatial planning and is already part of Planning Policy Statement (PPS)10 so Defra anticipates that the additional burden on planning applicants and planners is expected to be very small. However, Defra proposes to:

- Update PPS10 to reflect the new waste hierarchy
- To require local authorities to have regard to the waste hierarchy when preparing Waste Development Frameworks (the NLWP forms part of each borough's LDF in North London).

The waste hierarchy already applies to waste facilities subject to Integrated Pollution Prevention and Control (IPPC) Permits such as the Edmonton incinerator, because the permitting requirements incorporate reference to the waste hierarchy. For new IPPC permitted facilities it is proposed that the planning consent process will require consideration of the waste hierarchy before approval is given. For non-IPPC permitted waste facilities it is proposed that the Environment Agency and local authorities will require consideration of the hierarchy in assessing applications for new facilities. With existing facilities new conditions will be placed upon them as and when permits are reviewed.

The additional cost to the Environment Agency of implementing this approach is put at between £78,488 and £117,732 per year. Administrative costs to the public sector are anticipated to be similar according to the consultation document.

These changes to the planning system are not expected to have a major impact upon the Authority although they may impact upon individual planning applications. For example if a waste contractor was proposing to apply for planning and permitting permission for a waste recovery facility (which is less desirable in waste hierarchy terms than a recycling facility for example), it may be necessary to demonstrate that the facility has been sized appropriately taking into consideration the fact that prevention, preparation for reuse and recycling options higher up the waste hierarchy are handling other elements of the waste stream and that the proposed facility is appropriately sized, in order to demonstrate compliance with the above.

It is hoped, according to the consultation document that businesses will be able to adapt their operations, if necessary, during the permitting application process or in advance of a permit review and by so doing take account of the waste hierarchy at least cost to themselves. The same would apply to local authority waste contractors.

Applying the new waste hierarchy to waste transfer notes

Defra is proposing to expand the information provided on "Duty of Care" waste transfer notes and Hazardous Waste Consignment Notes to include waste hierarchy information. These documents must be completed when waste collected from anywhere other than households moves from one person or 'waste holder' to another. The government is proposing that waste holders will be required to include information on the transfer or consignment note about how they have taken account of the waste hierarchy in coming to their decision about what to do with the waste detailed on the note.

It is suggested in the consultation that for some types of waste, 'departures' from the waste hierarchy may deliver better environmental outcomes, but that these departures will need to be justified by life-cycle thinking.

The Authority is currently responsible for securing signed annual waste transfer notes for all waste movements from the constituent borough councils to the Authority. However, it would fall upon the constituent borough councils initially to add some words to the transfer notes about how they have taken account of the waste hierarchy in coming to their decision about what to do with the waste detailed on the note. Accordingly this change would not have a significant impact upon the Authority but may have some administrative impact upon the constituent borough councils, although this is likely to be minimal.

Collection requirements

Defra propose to transpose the general requirement to promote high quality recycling through a requirement to establish one or more waste management plans. The content of these plans is set out in Part 3 of Schedule 1 to the draft Regulations and includes:-

> "**Policies in relation to separate collection of waste**
> Measures to promote high quality recycling including the setting up of separate collections of waste where technically, environmentally and economically practicable and appropriate to meet the necessary quality **standards for the relevant recycling sectors".** (*Highlights from the consultation document*). The requirement for separate collections applies to paper, metal, glass and plastic.

Given that the majority of local authorities already provide separate collections of these materials for household waste (and there is nearly a further 5 years before this requirement comes into force (deadline 1st January 2015)) Defra does not intend to set up additional measures to meet this rWFD requirement. Defra anticipates that measures will be developed and implemented through existing and future waste strategies in ensure compliance.

However, while Defra is content with the statutory obligations on local authorities it is proposing to make it a civil issue for a private company not to collect waste separately. Defra also invites comments on placing conditions on waste carriers as an alternative.

The obligation to provide a separate collection by 1st January 2015 for paper, metal, plastic[4] and glass will be placed upon local authorities and on others as specified in the draft Regulations where they collect these four waste material streams. North London authorities already comply with this requirement in relation to household waste collections so it will not have any impact upon the constituent borough councils.

Additionally the consultation document notes that where separate collections of these materials are not being made from commercial premises this is sometimes because it is not economic to do so and therefore it is reasonable to argue that separate collection is already available "where economically practicable" and where not it tends not to occur. However, there could be cases where it is difficult to argue that this is the case. Accordingly the requirement to provide separate collections of these materials from 'trade waste' customers could impact upon the nature of trade waste services provided by the constituent borough councils and accordingly the Authority's long term solution for managing materials presented as a result, particularly if a borough's decision not to collect one of these materials from trade waste customers is challenged.

Recycling Target

The UK's interpretation of the 2020, 50% recycling target contained within the rWFD is that it will be applied across all waste from households, rather than individually to the four specific waste streams of paper, metal, plastic and glass. The term 'waste from households' is slightly different from the UK's definition of 'household waste' which includes a number of non-domestic waste streams e.g. waste from schools and universities. There are proposals in place to amend the UK's definition to bring it in line with the EU term which would result in some elements of 'household' waste being excluded in future. More work is needed to assess any specific implications but Defra notes in the consultation document that these differences in definition are not expected to make a significant difference to the recycling rate or the UK's ability to meet the 2020 rWFD target. Given the general support for the target outlined by responses to the stage one consultation there are no plans to now review the target in the light of this previous stage of the consultation process.

In addition to the above the Defra consultation notes that it intends to reverse current Defra policy to allow metals recovered from incinerator bottom ash to be classed in as recycling in England, as this waste can be reprocessed into products suitable for uses similar to the original. This will bring England in line with the approach taken in the rest of the UK.

Other wastes that do not meet national 'end-of-life' criteria however are unlikely to be classified as recycling and will instead be classified as recovery – which will potentially impact upon the classification of outputs from composting and anaerobic digestion. If the outputs do not national 'end-of-life' criteria, i.e. PAS 100 and PAS 110 standards, then the tonnage may not count towards recycling targets.

[4] 'Plastic' is being interpreted as 'plastic bottles' only at this stage, in recognition that the collection of mixed hard plastics may not be technically or economically practicable.

However, an email from the Waste Framework Directive Unit in Defra on 31st August notes that the European Commission has tabled a measure which will be subject to a qualified majority vote (QMV) by Member States at a meeting of the rWFD Technical Adaptation Committee on 16 September. Specifically, the email notes that the following provision will be considered in the Commission Decision:-

> "Where the target calculation is applied to the aerobic or anaerobic digestion of biodegradable waste, the input to the aerobic or anaerobic treatment may be counted as recycled where that treatment generates compost or digestate which is, where necessary after further treatment, used in recovery operations as described in point R10 of Annex II to Directive 2008/98/EC."

If the Commission Decision is adopted in this form it will be necessary for the Government, in consultation with the Devolved Administrations, to consider whether the Article 11(2)(a) target should be complied with by reference to national end-of-waste protocols for compost and digestate or whether recycling for the purposes of the target should include compost and digestate consigned as waste to an 'R10 recovery operation'. In other words this could potentially enable digestate and compost used for recovery purposes to count towards recycling and composting targets even if it didn't meet the Government's own 'end-of-waste', i.e. PAS 110 and PAS 100 standards.

The exclusion of some non-domestic wastes from the definition of 'waste from households' will reduce both the tonnage of 'household' waste recycled by the Authority and the overall tonnage of what is now classified as 'household waste' thereby affecting both the numerator and denominator of the recycling rate calculation. Any negative impact on recycling rates resulting should be more than offset by the additional recycling tonnage allowed from the inclusion of incinerator bottom ash metal recycling, the tonnage for which will only be added to the numerator of the recycling calculation. The Authority's last annual 'Best Value Performance Plan, 2008' showed that at the time the household recycling rate (for 2007/08) was 17% but if incinerator residues were added, the rate would increase to 26%. Whilst this included both ash and ash metal, it can be expected that the change of policy to include ash metal in recycling figures should result in an increase in the overall 'household' waste recycling rate of North London.

The move to potentially only allow the inclusion of PAS certified compost and digestate to count towards recycling rates will not affect the Authority's current recycling rate as the material from the Edmonton EcoPark in-vessel composting facility (IVC) is already PAS 100 accredited. However, during the commissioning phases of new facilities, where material is not yet certified to PAS standards, if the current Defra proposals stay in place, then material produced during these periods would not count towards local or national recycling targets, although it would count towards national 'recovery' targets. If the Commission decision reverses this approach, then as long as the product is used for an R10 recovery operation, irrespective of its certification status, then it will count towards the recycling targets, which would enable uncertified product produced during commissioning to also be included.