



Oxfordshire
Waste Partnership

Annex D

Options for residual waste (treatment and disposal)

**No Time to Waste:
The Oxfordshire Joint Municipal Waste Management Strategy**

Introduction

This annex provides a summary report describing the evaluation and assumptions used to assess how each of the collection options (in Annex C – Options for recycling and composting collections) impacts upon the treatment and disposal options (Coupling). The Coupling Assessment was undertaken so that the outcomes could shape both the Core Strategy and procurement of future residual waste capacity.

This annex supports the following policies in the Strategy:

Policy 6	<p>The Oxfordshire Waste Partnership will provide an integrated system of collection and processing of household waste which will achieve, as a minimum:</p> <p>By 31st March 2010: recycle or compost at least 40% of household waste;</p> <p>By 31st March 2015: recycle or compost at least 45% of household waste;</p> <p>By 31st March 2020: recycle or compost at least 55% of household waste.</p> <p>(Waste Strategy 2000 recycling and composting targets for household waste)</p>
Policy 9	<p>The Oxfordshire Waste Partnership will provide a system for recovering value from residual wastes in order to meet LATS targets.</p>
Policy 10	<p>The Oxfordshire Waste Partnership will ensure optimum use of landfill void.</p>

Table 1 – Core Strategy policies pertinent to Annex D Options for residual waste

The Landfill Allowance Trading Scheme (LATS) and the need for waste treatment

In recent years, the County Council and District Councils, both collectively individually, have taken an active role in promoting waste reduction, reuse and recycling. This has been to move towards a more sustainable future for Oxfordshire and to achieve statutory and local targets. The need to improve performance will continue and is, in particular, being driven by European legislation.

The European Union (EU) Landfill Directive 1999 sets challenging targets for the diversion of the biodegradable portion of municipal solid waste (MSW) from disposal to landfill. Oxfordshire must reduce the amount of biodegradable wastes landfilled to:

- 121,700 tonnes by 2009/10;
- 81,000 tonnes by 2012/13;
- 56,700 tonnes by 2019/20.

Central Government's National Waste Strategy 2000, supports the need for development of more sustainable waste management methods and processes. It sets out national waste recovery and recycling and composting targets:

- To recover value from 40% of municipal waste with at least 25% of household waste recycled or composted by 2005;
- To recover value from 45% of municipal waste with at least 25% of household waste recycled or composted by 2010.

In 2003, the Government passed the Waste Emissions and Trading Act (WET Act), which is a key driver for change in waste management practices. The WET Act has implemented the Landfill Allowance Trading Scheme (LATS) which sets allowances for each Waste Disposal Authority (WDA) for tonnes of biodegradable waste that can be sent to landfill. Targets have been set from 2009/10, every year, up to 2020, based on the targets in the EU Landfill Directive. The financial penalties for non-compliance with legislation if a WDA fails to meet its landfill allowance targets are severe. The County Council (Oxfordshire's WDA) must either reduce the amount landfilled every year, face being penalised financially if we fail to meet these targets, or purchase allowances from another authority (if they are available) in order to landfill waste beyond our allowances.

Financial penalties will be £150 for each tonne of biodegradable municipal waste landfilled above the agreed landfill allowance in the target years of 2009/10, 2012/13 and 2019/20, plus potentially a share of any additional fine levied on the UK by the EU. The cost of purchasing an allowance in the future is currently unknown, but in the target year of 2009/10 and for a period thereafter it is likely to approach the level of the fine (£150, reflecting the national rate of progress in reducing reliance on landfill). In addition the costs of landfill are increasing due to increases in the Landfill Tax, which is forecast to increase by £3 per tonne each year up to 2011 (2005/06 tax is £21 per tonne). Therefore, the County Council has to implement alternative ways of diverting municipal waste from landfill, to reduce reliance on landfill as the final means of disposing of waste.

Figure 1 shows:

- Municipal Solid Waste growth projections;
- The Biodegradable Municipal Waste content;
- The LATS allowances for Oxfordshire.

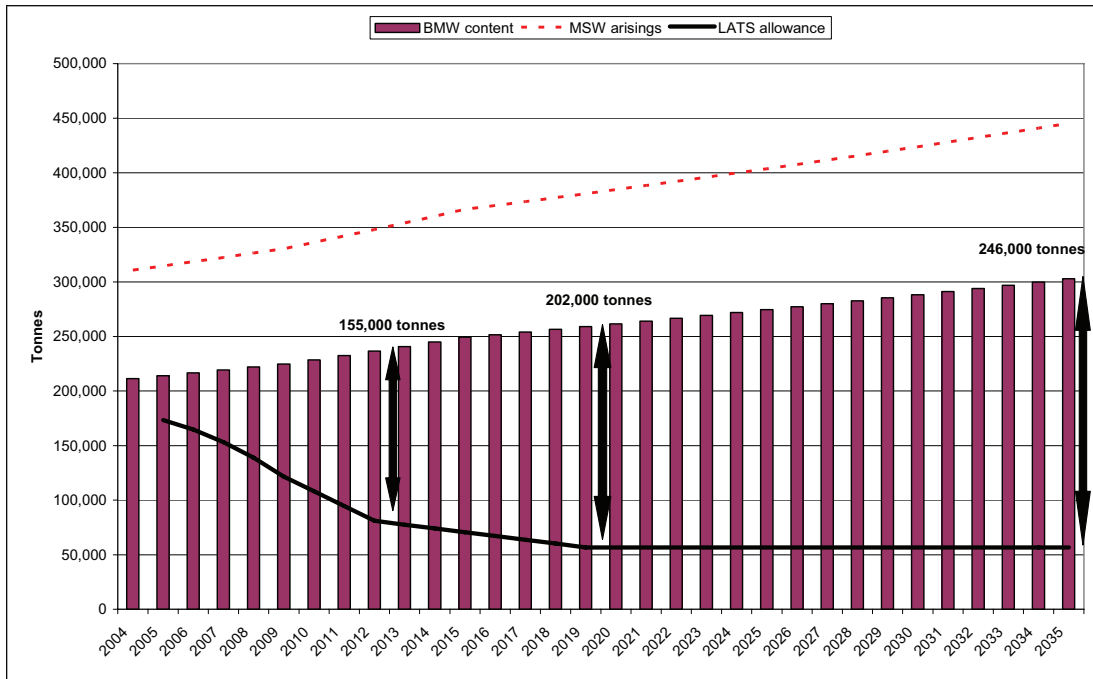


Figure 1: Oxfordshire Municipal Solid Waste profile

This indicates that, to meet LATS allowances, the County needs to divert around 155,000 tonnes of BMW from landfill by 2012/13, 202,000 tonnes by 2019/20 and potentially 246,000 tonnes by 2035/36 (depending on the landfill allowances beyond 2019/20). These tonnages are based on waste growth forecasts (from data currently available), and figures may vary depending on unpredictable future changes in waste growth. The requirement to divert waste from landfill would reduce in scale if the waste reduction, reuse and recycling targets in this Strategy were met. However, the reduction in growth would not be enough to alter the overall scale of the challenge, nor the need to commence procurement of new treatment capacity.

The Review

The County Council’s Evaluation of the available treatment options to help us meet our LATS targets, has been done in conjunction with the development of this Strategy by the OWP. Both the County Council’s and the Partnership’s work has been carried out on a ‘technology neutral’ basis. Table 2 explains all the work that has been carried out so far, and by which consultants.

Consultant	Work carried out
ERM	Performed an Evaluation of the waste reduction and reuse options and of the waste collection options
Enviros	Worked for OCC to develop plans for the future treatment of waste. Examined the impact of the collection options on treatment and disposal.

Table 2 - Work carried out and by whom

Collection options and their link to treatment/disposal options

Collection options were developed and evaluated at the beginning of the strategy development process. A total of 12 collection options have been examined (including a baseline) in conjunction with a range of treatment and disposal options for residual waste incorporating landfill disposal, Energy from Waste, Advanced Thermal Treatment and Mechanical Biological Treatment. Figure 2 below, shows how this process worked.

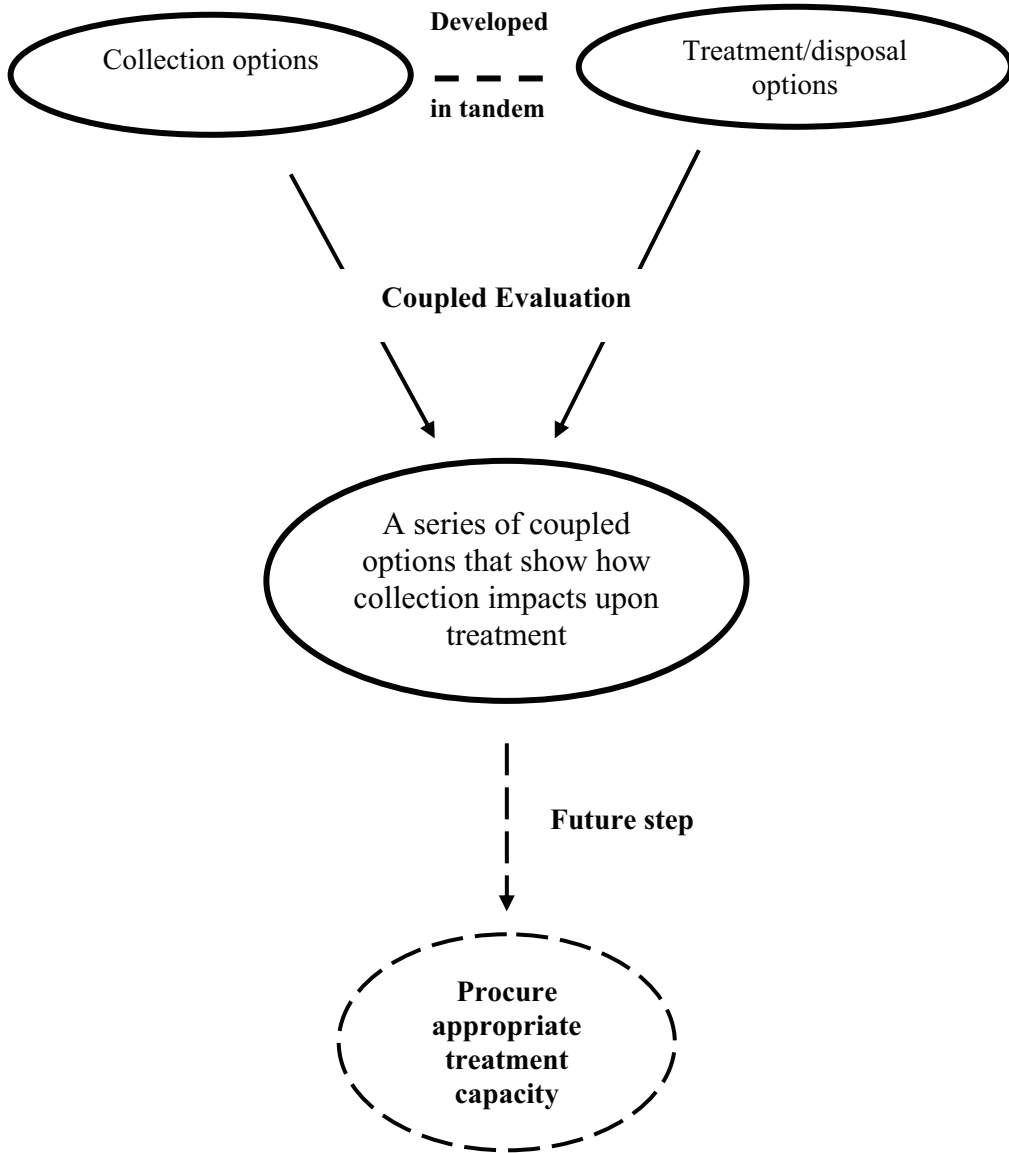


Figure 2 – The coupled Evaluation process

The coupled Evaluations

The following range of generic waste treatment and disposal options were coupled with each of the collection options for the coupled Evaluation:

- No treatment
 - all residual waste is sent directly to landfill
- Energy from Waste (EFW)
 - one or two facilities to treat residual waste
- Advanced Thermal Treatment (ATT)
 - one or two facilities to treat residual waste
- Mechanical Biological Treatment (MBT)
 - two plants to treat residual waste

The MBT option has been modelled with three possible sub-options:

- Refuse Derived Fuel (RDF) being combusted in a dedicated Oxfordshire facility;
- RDF being combusted through existing UK market structures;
- RDF being disposed of to landfill.

In addition, the model included the infrastructure needed for each of the collection, (such as composting facilities windrow and in-vessel), materials recycling facilities and transfer / bulking facilities.

Evaluation Criteria

Each combined collection and treatment/disposal option has been modelled in terms of waste flow and cost; then evaluated against a set of weighted criteria. The criteria were developed with Officers and Members of the OWP, to inform the future of waste management in Oxfordshire. The criteria are outlined in table 3. The criteria for, and the rankings of the various collection options is given in **Annex C (Options for recycling and composting collections)**.

Criterion	Weighting
Costs (operational & capital)	17.1%
Deliverability	14.8%
Opportunities / benefits	1.2%
Public participation / acceptability / demand	10.5%
BMW diversion from landfill	14.4%
Landtake / sites	2.3%
Flexibility	10.5%
Depletion of resources	3.1%
Air acidification	2.4%
Greenhouse gas emissions	5.1%
Public health impacts	9.3%
Extent of water pollution	2.3%
Total road kilometres	7%

Table 3 - Coupling Evaluation criteria

Results

For each of the short listed collection options, Energy from Waste (EfW) is found (against the criteria and weightings above) to be the highest-ranking residual waste management option. However, the differences between the residual waste management options are not large enough to be decisive. They are also sensitive to the weightings given to different factors (such as cost and deliverability). Importantly, the results show that the treatment options are not highly sensitive to the choice of collection option. All three of the main treatment options (EfW, ATT, MBT) have their strengths and their risks. These are outlined in Table 4.

Treatment	Strengths and risks
Energy from Waste	<ul style="list-style-type: none"> • The main factors in the high ranking of EfW are the robustness of the technology in terms of flexibility, BMW diversion and revenue from energy produced. • In line with the waste hierarchy, energy from waste should be used for the treatment of residual waste only where waste reduction, reuse, recycling and composting have been optimised. • The public engagement exercise has confirmed that EfW is the least favoured among the public. This may have been coloured by national experiences in the past where lower emission standards were achieved. These perceptions, even if based on outdated evidence, might heighten planning risks, possibly affecting the timing of delivery.
Advanced Thermal Treatment	<ul style="list-style-type: none"> • Advanced Thermal Treatment has excellent potential for revenue from energy which is eligible for Renewable Obligation Certificates (ROCs), and therefore can be sold at a higher price. If cost were the only consideration ATT would come out highest in the ranking. The same applies even if 50% of the weighting is based on cost. • It scores less well against other criteria. In particular there are concerns over the deliverability and flexibility of this technology for the treatment of mixed MSW, as it has yet to be proven in the UK. On the criteria and weightings used for this Evaluation it scores bottom.
Mechanical Biological Treatment	<ul style="list-style-type: none"> • The generic MBT option modelled ranks favourably against the criteria where any Refuse Derived Fuel (RDF) produced is sent for combustion through existing UK markets, rather than landfilling, or material combustion in a new dedicated Oxfordshire facility. This has obvious favourable financial and deliverability implications as no additional capital cost is incurred for a combustion plant, yet RDF is diverted from landfill. • There are substantial uncertainties over the availability of RDF combustion capacity within the UK market at present, and if this is not available MBT would be the highest cost option and/or secure only limited diversion from landfill.

Table 4 - Main treatment options - strengths and risks

It is important to emphasise that this options appraisal compares the performance of each option against a set of agreed weighted criteria. If these criteria change then the overall ranking may change. In addition, the appraisal exercise has been carried out by making a number of assumptions on waste arisings, markets, prices and costs. These are constantly subject to change, and any changes will affect the overall evaluation and performance of each of the options. Some of the assumptions (for example on construction costs and on disposal options of MBT residues) can only be established by testing the market.

Therefore, whilst EfW ranks highest overall, the results of this Evaluation are consistent with OCC's policy of being technology neutral and seeking market responses through a competitive dialogue tendering process before deciding on procurement of a particular technical solution.

Conclusion

This annex details the process and the outcomes of the Coupling Evaluation modeling exercise and the assumptions used to assess how each of the collection options (in [Annex C – Options for recycling and composting](#)) impacts upon the treatment and disposal options (Coupling). These results will now inform the procurement of appropriate treatment capacity in the future. The final treatment and disposal capacity will be in line with the overall OWP Strategy's vision, objectives and policies.