

Warwickshire Waste Partnership - 12th June 2007

The Provision of Biowaste Treatment Facilities

Report of the Strategic Director for Environment and Economy on behalf of the Officers Group

Summary

The report summarises the outcome of the work undertaken by the AEA Group on the provision of biowaste treatment facilities and recommends a way forward.

Recommendation

That Members endorse the way forward for In-Vessel Composting as detailed in paragraph 3.4.

1. Introduction

- 1.1 At the last meeting of the Partnership Mr Wheeler of the AEA Group presented options for Material Recycling Facilities (MRFs) and In-Vessel Composting plants. Following the presentation AEA completed their work and a final report has now been produced. A copy is available on request but the Executive Summary is appended to this report (see **Appendix A**).
- 1.2 At the last meeting it was proposed to have a special meeting to decide how to progress this work but due to local elections the way forward has had to be left as a decision for this meeting.
- 1.3 The cost of the work undertaken by AEA was £60,000 of which the Midland Centre of Excellence paid £41,000 and the County Council the balance.

2. In-Vessel Composting Plants

- 2.1 The only "biowaste" collected by councils and composted is currently green garden waste (the current composting contractors do not wish cardboard to be included). This can be composted in the open air using the windrow process. If kitchen waste is also collected then the biowaste must be treated in closed systems (in-vessel) to comply with legislation concerning the treatment of animal by-products. The kitchen waste can either be treated alone or with the green waste. If treated alone it needs to be separately collected.

- 2.2 The approved Waste Strategy proposes the collection and processing of food/kitchen waste. However, further detailed financial modelling was required as the financial case for collecting and processing kitchen waste needed clarification. It was therefore decided to have a detailed study carried out which was the main part of the work undertaken by AEA. The results re-emphasise the desirability of having an agreed collection methodology as soon as possible that has been endorsed by the District and Borough Councils at Member level
- 2.3 In discussion with the authorities, AEA examined a number of collection and processing options and the outcomes, pros and cons, are discussed and summarised in **Appendix A**. These are summarised further in the table below particularly with respect to cost implications. The figures refer to the situation in 2014/15.

| Scenario | Comment |
|--|--|
| Base Case: Refuse weekly, Recyclables kerbside sort, Green waste fortnightly | <ul style="list-style-type: none"> ▪ Lowest overall costs with LATS at £20/tonne (cost of buying landfill allowances). However, high risk associated with increasing LATS. ▪ No change in collection service required. ▪ Lowest recycling performance (38%). ▪ Public acceptance may be lower if Council does not provide sufficient effort in improving recycling/composting schemes. |
| No.5 Refuse weekly, Recyclables co-mingled, Mixed bio waste alternate weekly | <ul style="list-style-type: none"> ▪ Increase in recycling, because kitchen waste is included with green waste collection and cardboard and plastic included in co-mingled collection (40% recycling). |
| | <ul style="list-style-type: none"> ▪ No major change in collection service required. ▪ Capture rates of biowaste will likely be low, because less incentives are provided to residents to participate when providing weekly refuse collection. ▪ Could divert up to an additional 5,000 tonnes BMW away from landfill for the extra costs of £2 million to £2.5 million depending on the LATS price when compared to the Base Case. |

| | |
|---|---|
| <p>No.6 Refuse alternate weekly, Recyclables co-mingled. Mixed bio waste alternate weekly</p> | <ul style="list-style-type: none"> • Provides most benefits with overall lowest collection, treatment and disposal costs. • Capture rates of kitchen waste and dry recyclables are likely to be higher because of AWC for refuse increasing the recycling/composting level potentially to 43%. • A significant effort in education and awareness raising will be required in order to increase public acceptance and to reduce the political sensitivity and risk of AWC for refuse. • Could divert up to an additional 13,000 tonnes BMW away from landfill for the extra cost of up to £0.8 million (considering LATS at £20/tonne when compared to the Base Case). |
| <p>No.8 Refuse alternate weekly, Recyclables commingled, Mixed biowaste weekly</p> | <ul style="list-style-type: none"> • Highest level of recycling and composting (47%). • Highest collection cost but when considering increased recycling credits (for dry recyclables only), the costs to the Districts/Boroughs are similar to Scenario 5. • A significant effort in education and awareness raising will be required in order to increase public acceptance and to reduce the political sensitivity and risk of AWC for refuse. • Could divert up to an additional 25,000 tonnes biodegradable waste away from landfill for the extra cost of up to £1.2 million (considering LATS at £20/tonne) when compared to the Base Case. • Lowest risk in uncertainty of LATS values. This option becomes most cost effective with increasing LATS and increasing landfill tax. At £100/tonne LATS this option becomes the least expensive option. |

- 2.4 The outcomes are compared further in the table below. The costs take account of the recently announced increases in landfill tax.

| Scenario | Tonnes per annum of additional BMW diverted | Additional Cost £ per annum in 2014/15 | Cost £ per tonne of additional BMW diverted |
|----------|---|--|---|
| Base | 0 | 0 | 0 |
| 5 | 5,000 | 2,000,000 | 400 |
| 6 | 13,000 | 800,000 | 61 |
| 8 | 25,000 | 1,200,000 | 48 |

3. Way Forward

- 3.1 As discussed in paragraph 2.2, there was a need to clarify the financial case for collecting and processing kitchen waste. Preliminary calculations had indicated that the case was weak and the above analysis confirms this point. Only with scenario 8, and assuming we have to pay £100 per tonne for landfill allowances, does it become more cost effective than the Base Case. At the moment landfill allowances are changing hands at less than £10 per tonne and although this is expected to increase, it is not considered they will reach £100 per tonne. Even if they do, it may only be for one or two years before new plant comes on stream.
- 3.2 From a County viewpoint it is considered that we should move forward with Scenario 6, or a similar collection method to promote diversion with respect to in-vessel composting (i.e. the dry recyclables can either be sorted at the kerbside or in a MRF). Although this will be more expensive than current arrangements, it will assist in introducing the alternate weekly collection of refuse, in that residents with particularly odorous kitchen waste will still be able to dispose of it on a weekly basis should they wish to. Composting performance will be boosted by 5% across the County if all districts adopt this approach.
- 3.3 Some districts wish to adopt scenario 5. This scenario would include the weekly collection of residual waste and fortnightly collection of food and green waste. This scenario would give the householder the option to recycle their food waste by including it with their garden waste. This scenario would require a strong education campaign to encourage householders to use the green bin as opposed to the residual waste bin for their food waste. By encouraging a behavioural change on this basis it may later help to aid the introduction of alternate weekly collection schemes (householders would still have a weekly outlet for potentially odorous food waste). However this scenario is not desirable in terms of increasing performance and is currently considered too expensive for the increases in performance achieved.
- 3.4 As described in section 4, we are now starting to procure in-vessel composting facilities but it is considered that a final decision (by the County Council's Cabinet) on a way forward need not be made until tenders have been received and evaluated. Due to time constraints a further report to the Waste Partnership is not feasible. It is recommended that, with respect to in-vessel composting (i.e.

not with respect to the processing of dry recyclables), we move forward with Scenario 6 or a similar collection method to promote diversion, on the understanding that the final decision to place contracts to implement the scenario will be a matter for the County Council.

4. Proposed Procurement Process

- 4.1 In order to enable a suitable facility or facilities to be operational in time for the 2009/10 target year the procurement process for securing biowaste treatment capacity has already commenced with approval from the County Council's Cabinet, given on 19th April 2007.
- 4.2 The value of biowaste treatment facilities will exceed the EU procurement thresholds for services of £144,371. Therefore, it is proposed to use the EU restricted procedure.
- 4.3 Biowaste treatment facilities are an established and reliable technology, but they are new to Warwickshire and there are as yet no suitable facilities currently operational. However, there is considerable interest in the market for the provision of the service. It is therefore proposed that the usual procedure be enhanced by holding a bidders' day on 8th June for interested potential tenderers, prior to the commencement of the tender process. It is anticipated that holding such a day will increase competition in the provision of the service to the benefit of the Partnership. The facilitation of the bidders' day and development of the tender criteria is supported by Defra through consultancy support from Enviros.
- 4.4 Where biowaste is collected at the kerbside it will be collected together or 'commingled' with green waste to reduce collection costs. Any contracts to treat biowaste will therefore need to replace existing composting contracts for treating green waste. The majority of the existing composting contracts expire on 31st March 2008 and will need replacing, again following EU procedures as they are also above the threshold. The remaining composting contracts will be used to treat the green waste from the household waste recycling centres.
- 4.5 The services tendered for would be a combination of the treatment of green waste only and for commingled biowaste. This will give flexibility in switching treatment processes when the biowaste collection services come on line by agreement and in partnership with the District and Borough Councils.

- 4.6 Subject to satisfactory tenders and approval from the County Council's Cabinet on 6th September, the contracts for the services will be awarded by October 2007, in order to give the successful contractors 18 months to deliver the enhanced facilities needed by 1st April 2009 at the latest.

Enquiries: about this report should be made to Roy Burton, Operations Manager, Waste Management, 01926 412593, email royburton@warwickshire.gov.uk.

Background Papers

AEA Energy and Environment – Business Case for Biowaste Treatment Facility and Material Recovery Facility April 2007.

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30th May 2007

Warwickshire Waste Partnership - 12th June 2007

The Provision of Biowaste Treatment Facilities

Executive Summary

Warwickshire's Waste Strategy was adopted in October 2005 and outlines how the Warwickshire Waste Partnership proposes to manage waste in Warwickshire for the next 15 years, with particular reference to how the landfill diversion targets will be met. The objective of the Strategy is to provide a framework for the Partnership to increase resource efficiency and reducing their reliance on landfill as their primary means of waste disposal. As part of this challenge the County aims to reach 40-45% recycling and composting by 2009/10, which would contribute to meeting Warwickshire's landfill diversion target.

In order to meet these ambitious targets Warwickshire Waste Partnership has recognised the need to procure new waste management infrastructure. The first step in implementing the strategy is to focus on the potential use of material recycling facilities (MRFs) and biowaste treatment processes such as in-vessel composting (IVC) or anaerobic digestion (AD) in order to increase recycling and composting levels. However, the key unknowns for Warwickshire County Council (WCC) are:

- the levels of increase of collected recyclable and compostable materials in future years, and
- the cost effectiveness taking into account future costs such as processing and landfilling costs.

This Business Case discusses the following issues:

- Expected benefits and issues necessary to be considered in making a decision;
- Interfacing with current waste management systems,
- Costs and benefits of various biowaste collection and processing options
- Costs and benefits of a co-mingled collection scheme and a MRF
- Procurement and partnership arrangements available and the risk associated with these;

The Business Case takes into account the complete waste management service and associated costs, including landfill tax and landfill allowances. No consideration of alternative residual waste treatment options has been undertaken.

Options for biowaste collection

The following scenarios were assessed for biowaste collection and processing. It considers:

- The likely impact on capture rates of biowaste considering alternate weekly collection of refuse;
- The possibility to collect kitchen waste separately or mixed with garden waste;

- Enhanced capture rates of dry recyclables when collecting refuse fortnightly, because “more pressure” would be placed on residents to participate in recycling schemes.

| Scenario | Green waste | Kitchen waste | Mixed biowaste | Residual waste | Capture rate of kitchen waste (Kg/HH/week) | Dry recyclables |
|-----------|-------------|---------------|----------------|----------------|--|--|
| 1 | Fortnightly | AWC | - | Weekly* | 0.5 | Co-mingled, increased recycling when changing to AWC for refuse. |
| 2 | Fortnightly | AWC | - | AWC | 1.0 | |
| 3 | Fortnightly | Weekly | - | Weekly* | 0.75 | Co-mingled, increased recycling when changing to AWC for refuse. |
| 4 | Fortnightly | Weekly | - | AWC | 2.0 | |
| 5 | - | - | AWC | Weekly* | 0.5 | Co-mingled, increased recycling when changing to AWC for refuse. |
| 6 | - | - | AWC | AWC | 1.0 | |
| 7 | - | - | Weekly | Weekly* | 0.75 | Co-mingled, increased recycling when changing to AWC for refuse. |
| 8 | - | - | Weekly | AWC | 2.0 | |
| Base case | Fortnightly | - | - | Weekly* | - | Kerbside sorting |

AWC = Alternate weekly collection

* AWC for refuse in Warwick from 2008 in all options including increased recycling & associated level of biowaste capture rate.

A number of more favourable biowaste collection scenarios were selected for undertaking some further comparison. Scenario 5, 6 and 8 were selected, mainly because:

- Scenario 5 and 6 showed the lowest collection costs and are therefore favoured by the Districts/Boroughs.
- Scenario 6 showed the lowest overall costs combining collection, treatment and disposal costs.
- Scenario 8 has the highest landfill diversion rate (beside Scenario 4) and therefore shows the lowest risk against future increased LATS penalties and increasing landfill tax. (Scenario 4 was discounted due to higher collection and processing costs).
- Considering the total cost of management (collection, treatment and disposal) and the implications for the council tax payer in Warwickshire Scenarios 2, 5, 6 and 8 show the lowest costs. However, scenario 2 was discounted, due to the deliverability difficulties associated with implementing this type of scheme, as expressed by the District officers in relation to the space restrictions within Warwickshire households.

However, the comparison to the Base Case indicates that it may be less expensive continuing with kerbside sorting of dry recyclables and garden waste collection. Consequently, the politically sensitive issue of AWC for refuse may not be necessary to be tackled but other aspects should also be considered before making a decision such as the following:

- The value for the Landfill Allowance Trading Scheme (LATS) will depend on the market demand for landfill allocations in England. Pricing of future LATS is highly uncertain and will significantly increase the risk to WCC budgets.
- The Government has recently announced in its budget setting that landfill tax will be increased by £8/tonne per annum from April 2008 until 2011. The potential impact of further increases beyond 2011 in both the final value and rate of increase need to be taken into account in the risk analysis.
- Warwickshire's preferred option for residual waste is thermal treatment and public acceptance of the overall waste management strategy needs to be considered. If Warwickshire Waste Partnership does not put sufficient effort into improving recycling and composting performance, the thermal treatment may be less acceptable to the public which could delay its planning and procurement process resulting in higher LATS penalties.

The following table summarises the benefits and issues for the Base Case and Scenario 5, 6 and 8.

| Scenario | Service | Comments |
|------------|--|---|
| Base Case | Refuse - weekly Recyclables - kerbside sorting Green waste - fortnightly | <ul style="list-style-type: none"> • Lowest overall costs with LATS at £20/tonne. However, high risk associated with increasing LATS. • No change in collection service required. • Lowest recycling performance (38%). • Public acceptance may be lower if council does not provide sufficient effort in improving recycling/composting schemes. |
| Scenario 5 | Refuse - weekly Recyclables - co-mingled Mixed biowaste - AWC | <ul style="list-style-type: none"> • Lower collection costs likely due to change to co-mingled service and increased recycling credits (dry recyclables only). • Increase in recycling, because kitchen waste is included with green waste collection and cardboard and plastic included in co-mingled collection (40% recycling). • No major change in collection service required and most likely to be accepted by the public without any further education and promotion campaigns. • Capture rates of biowaste will likely be low, because less incentives are provided to residents to participate when providing weekly refuse collection. • Could divert up to an additional 5,000 tonnes BMW away from landfill for the extra costs of £2m to £2.5m depending on the LATS price (at £56/tonne landfill tax) when compared to the Base Case. |

| Scenario | Service | Comments |
|------------|---|---|
| Scenario 6 | Refuse - AWC Recyclables – co-mingled Mixed biowaste - AWC | <ul style="list-style-type: none"> • Provides most benefits with overall lowest collection, treatment and disposal costs. • Capture rates of kitchen waste and dry recyclables are likely to be higher because of AWC for refuse increasing the recycling/composting level potentially to 43%. • A significant effort in education and awareness raising will be required in order to increase public acceptance and to reduce the political sensitivity and risk of AWC for refuse. • Can be seen as a starting point to introduce kitchen waste collection. Over time, residents get used to segregation of kitchen waste and extension to a weekly service may be considered at a later stage. IVC technology has the benefit that is modular with typically of about 8,000 tonnes/year providing some flexibility. • Could divert up to an additional 13,000 tonnes BMW away from landfill for the extra cost of up to £0.8m (considering LATS at £20/tonne and increased landfill tax at £56/tonne) when compared to the Base Case. • But it still depends on the deliverability of the overall service. If a number of districts are not able or unwilling to change to AWC refuse collection, a lower participation and capture rate of kitchen waste and dry recyclables are likely resulting in lower recycling/composting and landfill diversion rates. Consequently, the total waste management cost would get closer to Scenario 5. |
| Scenario 8 | Refuse - AWC Recyclables – co-mingled Mixed biowaste - weekly | <ul style="list-style-type: none"> • Highest level of recycling and composting (47%). • Highest collection cost but when considering increased recycling credits (for dry recyclables only), the costs to the Districts/Boroughs are similar to Scenario 5. • A significant effort in education and awareness raising will be required in order to increase public acceptance and to reduce the political sensitivity and risk of AWC for refuse. • Could divert up to an additional 25,000 tonnes biodegradable waste away from landfill for the extra cost of up to £1.2m (considering LATS at £20/tonne and increased landfill tax at £56/tonne) when compared to the Base Case. • Lowest risk in uncertainty of LATS values. This option becomes most cost effective with increasing LATS and increasing landfill tax. At £100/tonne LATS this options becomes the least expensive option. |

The assessment of the preferred geographical structure for in-vessel composting (IVC) highlighted the following points:

- Two IVC locations within Warwickshire will lead to higher collection costs, in particular for Rugby as they would have furthest to travel to Packington.
- No change for Stratford and Warwick as they would always deliver to Gaydon.
- No significant difference in distance for North Warwickshire to either Packington or Judkins as it does not cause a change in vehicles required.
- Implication on the collection costs is more significant in Scenario 8 as more tonnage of kitchen waste is collected.
- Three facilities located at Judkins, Kilsby and Gaydon are shown to provide the most cost effective geographical structure due to the shorter distance to Judkins for Nuneaton and Bedworth and for Rugby to Kilsby. The reduced transport is reflected in the collection costs although this needs to be balanced against the slightly higher gate fee.
- With more kitchen waste collected (as shown in Scenario 8) the collection costs outweigh the additional costs of operating smaller facilities.
- Overall, Judkins is slightly more favoured than Packington considering collection costs and the transport of rejects to landfill.
- The increased environmental impact of multiple sites needs also to be considered. Smaller sites may have less impact, e.g. fewer vehicle movements, but the actual number of residents affected are likely to increase when considering three sites instead of two.

Change to co-mingled collection and options for MRF locations

The Business Case indicates that co-mingled collection with a MRF or continuing with kerbside sorting schemes are both viable options for Warwickshire Waste Partnership. Although collection costs may be reduced when changing to co-mingled collection Warwickshire Waste Partnership needs to decide whether the effort of planning and procuring a MRF provides sufficient benefits. Financial aspects alone do not recommend a MRF, however co-mingled collection can provide certain benefits such as increasing recycling rate and reduced transport and congestion on roads due to fewer and more efficient vehicle movements. Health and Safety issues for the collection service crew also need to be considered as there are more risks involved with kerbside sorting due lifting boxes and sorting activities.

If considering a MRF to be beneficial, the assessment of geographical structure shows that one MRF located in Rugby provides the optimum arrangement for all Districts/Boroughs although increased costs for bulking the dry recyclables need to be picked up by either the WCAs or the County Council. Overall, there is little difference in total costs for the council tax payer between a single MRF located at Ufton or at Rugby and the decision must be made between either slightly higher collection costs for three Districts/Boroughs or increased costs of bulking. The reality will be down to the deliverability issues of each of these sites.

Locating the MRF at Rugby is considered as the favourable choice when taking into account both the lower transport to a Rugby MRF and the only small difference in costs.

Partnering options

Partnering with other authorities would provide the benefit of Economy of Scale for the IVC and MRF options, reducing the estimated gate fee. Initial discussions were held with Coventry and Solihull and also Tamworth District Council and they all expressed an interest in some partnership arrangements. Packington would be the most suitable location considering the geographical structure for all potential partners for both MRF and IVC.

Warwickshire Waste Partnership will have to consider the risk associated with partnering with other local authorities and the likelihood of delay to the project. The benefits of economy of scale are particularly noticeable for a MRF and should be considered as a long-term solution. However, finding the ideal location for all Partners would prove some difficulty as Packington is the location most suitable for Coventry and Solihull but would increase significantly Rugby's transport costs. It should be further considered whether Rugby could deliver to Packington via bulking at Rugby Depot. This solution would reduce the collection cost and environmental impact for Rugby and provide the 'Economy of Scale' benefit to WCC at Packington.

Interim arrangements

Northampton Borough Council and Oxfordshire County Council were the only local authorities expressing interest for potential partnering or providing capacity to WCC. Northampton Borough Council may have spare MRF capacity for Warwickshire and they requested to be contacted by WCC for further discussion. Oxfordshire CC indicated that they would be very interested in partnership arrangements with Warwickshire for both MRF and biowaste processing facilities. Thus, an initial meeting is recommended with each Council to determine the potential for partnership working or interim arrangements.

RU Recycling received planning permission for a MRF in the Birmingham area which is due to start operation in September 2007. The company are currently offering a number of options to all local authorities in the area. These options are:

- 1) A 100% single stream (co-mingled collection) of cans, plastics, paper, glass etc, or
- 2) A dual stream, where the paper, newspapers, magazines are collected in one stream, with a separate stream for glass, cans, HDPE (high density PE plastics) and plastic bottles.

RU Recycling would be pleased to discuss with Warwickshire the opportunity to buy capacity at their new MRF as an interim arrangement or also for the long-term. We understand that WCC has already contacted RU Recycling and initial discussions are taking place between the contractor and Warwickshire's Districts/Boroughs in order to identify the potential options for introducing co-mingled collection and delivering the materials to the MRF.

Although the RU Recycling MRF was investigated as an opportunity for interim arrangements, it may also provide an option for a long-term solution to Warwickshire Waste Partnership. Due to the constraints of individual contractual arrangements Warwickshire's Districts/Boroughs are in very different positions in respect to their ability to change to co-mingled collection. The RU Recycling MRF would provide the benefit that Warwickshire Districts would have the choice without the County Council having to plan, procure and potentially build/operate a MRF. However, it will ultimately depend on the commercial deal that can be struck with RU Recycling as to the attractiveness of this particular arrangement.

Management of risk and overall conclusions

This Business Case does not provide the absolute answer to which option should be taken as the preferred solution, however it does highlight a number of choices and issues:

- Changes in collection service with introducing kitchen waste collection linked to AWC for refuse is likely to provide the highest level of recycling, composting and landfill diversion.
- The move to AWC can be difficult but is vital in the absence of any other incentives (such as 'pay as you throw') in providing the "pressure" on the householders to increase participation in recycling schemes.
- Any changes in collection services will need to be accompanied by a well prepared education and awareness raising campaign to ensure public acceptance.
- Ensuring sufficient resources are committed to supporting the public during the change is vital to a successful implementation.

In summary, Warwickshire Waste Partnership has to find a balance between two considerations:

- 1) Lower collection costs but increased treatment and disposal costs, or
- 2) Higher collection costs but potentially lower risk to increasing landfill costs including LATS and landfill tax.

The recycling credits are likely to outweigh some of the increased collection costs, however Warwickshire Waste Partnership may wish to consider providing credits for increased biowaste collection to provide an incentive for the introduction of weekly kitchen waste collection combined with AWC for refuse. A significant effort in education and awareness raising will be required by the Districts/Boroughs in order to increase public acceptance and participation rates for recycling and biowaste collection, in particular when linked with alternate weekly refuse collection. The costs for these education campaigns in future have not been included in the collection costs.

In making the decision for future recycling and composting services, Members and Officers of all Districts/Boroughs and the County Council should consider the overall impact of the TOTAL waste management costs to the council tax payer and not collection costs or treatment and disposal costs in isolation.

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17th May 2007