

## Project Summary: Remade 2009/10 - Scheme Optimisation

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For: Zero Waste Scotland

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Zero Waste Scotland was established in January 2010 to provide a single, Scotland-focussed delivery programme, driven by and aligned to deliver the Zero Waste Plan. The new programme integrates the activities of the following programmes: Waste Aware Scotland; Envirowise Scotland; Remade Scotland; Keep Scotland Beautiful; NISP; and some programmes delivered by the Community Recycling Network for Scotland.

The Caledonian Environment Centre is part of the School of the Built and Natural Environment, Glasgow Caledonian University and is supporting environmental research and policy development in Scotland.

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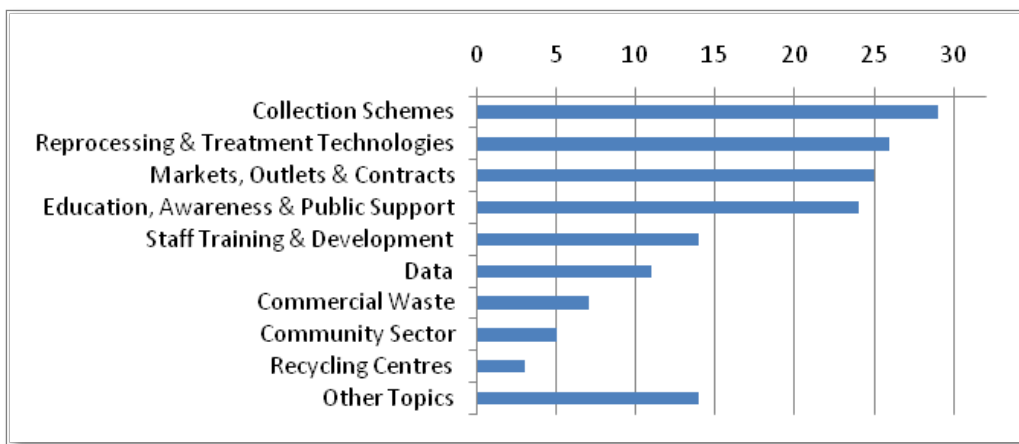
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# 1. Introduction

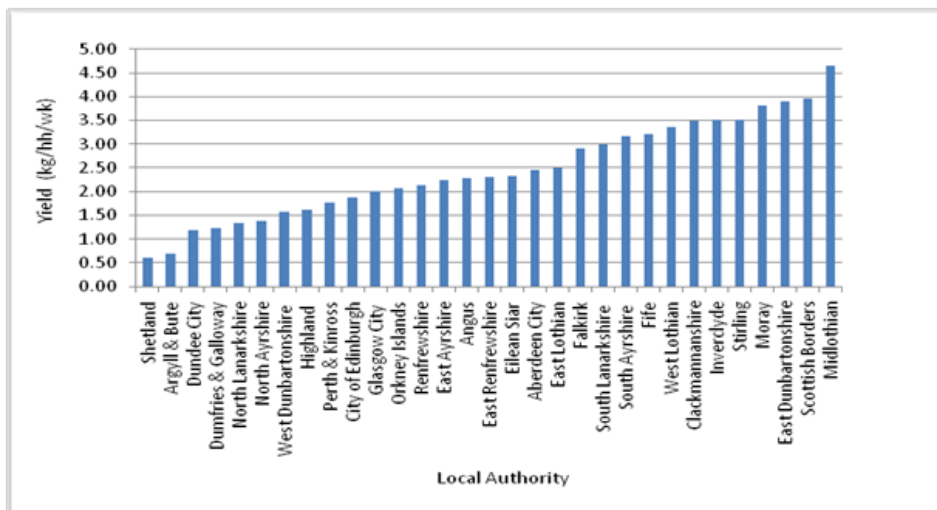
## 1.1. Background

Following the announcement in January 2008 from Rural Affairs and Environment Minister Richard Lochhead, outlining ambitions for a Zero Waste Scotland, Local Authorities are under increasing pressure to deliver on challenging recycling targets. In 2008/2009, Remade, guided by a steering group of 7 Local Authorities, conducted an extensive series of interviews with Waste Management Officers in all 32 Local Authorities to identify the potential support needed<sup>1</sup>. The top priority identified by Councils was direct assistance to support enhancing recycle collection services.



**Scottish Councils Top 10 Priority Research Requirements**

In addition, research carried out as part of the Remade Kerbside Best Practice review in 2008/9 indicated significant variation in scheme performance across Councils. More detailed analysis of the findings has also indicated that recycling performance often varies within individual recycling schemes and across individual Council areas.



<sup>1</sup> [http://www.remadescotland.org.uk/media/11666/lars\\_needs%20assessment.pdf](http://www.remadescotland.org.uk/media/11666/lars_needs%20assessment.pdf)

To address the specific support needs for improvement in Kerbside Collection Schemes, Remade Scotland working with the Local Authority Steering Group developed a series of options within a targeted programme to assist individual Councils optimise their recycling schemes<sup>2</sup>.

The offer of direct assistance was made to all Councils.

In addition the LA Steering Group also identified two pieces of research work that they felt would be of general support and value to all Councils.

**1. Ready Reckoner;**

The Group identified that the Remade Kerbside Best Practice Report contained a significant level of useful data, but as it was often presented in graphical form it could not be easily interrogated and requested that the data be made more readily available.

**2. Analysis of the Top Ten Recycling English Councils.**

A number of Councils expressed interest in the factors associated with the success of those English Councils with high recycling rates.

## **1.2. Aims**

The aim of the programme was to assist Scottish Councils achieve higher recovery rates through targeted support, working directly with each Local Authority. Based on an established knowledge and experience of working with Councils on scheme optimisation, Remade was ideally placed to assist the Local Authorities. All 32 Councils were offered a package of assistance and in 2009/10 nine Councils requested direct assistance. The programme involved discussions with Councils on their objectives and needs which generally came under the following themes:

- Review of the current kerbside dry recyclate collection service;
- Identification of areas of potential enhancement;
- Examination of the opportunities where additional or new and innovative services could be introduced.

The following table summarises the support provided to these Councils

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<sup>2</sup>

<http://www.remadescotland.org.uk/media/12985/remade%20scheme%20optimisation%20proposal%20to%20cosla%20-%20june%202009.pdf>

<b>Council</b>	<b>Work Programme Delivered</b>
<b>Aberdeenshire</b>	Development of an assessment methodology for the Councils 29 kerbside dry recycling day routes to evaluate and compare route efficiency (i.e crewing levels, working hours, loading times, collection times, and driving times) to allow identification of day routes with spare capacity and highlight appropriate resource levels for the existing service along with any cost savings.
<b>Argyll &amp; Bute</b>	Evaluate the impact of a number of resource efficiencies within the various recycling and waste services, coupled with the introduction of a new glass collection service in Helensburgh
<b>East Renfrewshire</b>	An options appraisal of the impact on the recycling rate of various scenarios such as AWC, combined food and garden and revision of the existing dry recycle service. The analysis identified that the Council could expect to increase its overall recycling rate by between 3.5% and 14.2% depending on which scenarios were adopted.
<b>Edinburgh</b>	An evaluation of the impact on recycling rate and high level costs of changes to the existing box scheme or switching from box to bin.
<b>Fife</b>	Fife council recently undertook a trial of a mixed food/garden waste collection service to about 5,500 households. The review included an assessment of the compositional analysis of the amount food and garden waste collected. And an evaluation of the performance of each trial scheme
<b>Glasgow</b>	A high level analysis of the impact on recycling levels, landfilled tonnage and financial implications of moving to a 'Managed Weekly' or AWC of residual and recycle.
<b>Midlothian</b>	Midlothian Council requested an evaluation of activities at its Recycling Centres (RCs). As the Council with the highest kerbside recycling rate in Scotland, Midlothian Council requested an evaluation of their Recycling Centres identifying areas of this service where recycling performance could be improved. A list of recommendations were provided for the Council based on the work which included; compositional analysis of the residual waste element, staff training, additional signage and public education and information.
<b>West Dunbartonshire.</b>	Development of a survey methodology to support the Council during implementation of a new alternate weekly collection of recycle and residual collection
<b>West Lothian</b>	West Lothian Council manages nearly 110,000 tonnes of Municipal Solid Waste each year. The waste is presented by householders and commercial customers in many different ways: kerbside collection of recycles and residual waste, at CA sites, bring sites. At the same time the council has numerous arrangements with private contractors for recycling, treatment or disposal of that waste. On behalf of the Council Remade reviewed the waste data tool currently used by the Council in the context of the wider information needs of the Council and the specific requirements of WDF and advised on alternate options.
<b>Others</b>	There are a number of ongoing discussions with Highland, Perth & Kinross, North Ayrshire and South Ayrshire Councils about how they might be able to best use the programme to assist them. It is hoped that these Councils and others will be helped throughout 2010/11 as part of the Caledonian Environment Centres contribution to the Zero Waste Scotland programme.

## 2. Work Programme & Methodology

### 2.1. General Research Support

In conjunction with the COSLA steering group, several Councils expressed interest in two specific general research projects that would be useful to all local authorities. The time that these Councils would have received individually was then pooled together to provide the general research support. There were two pieces of research work that was carried in such a manner for the benefit of all Councils as agreed with the COSLA steering group. These were:

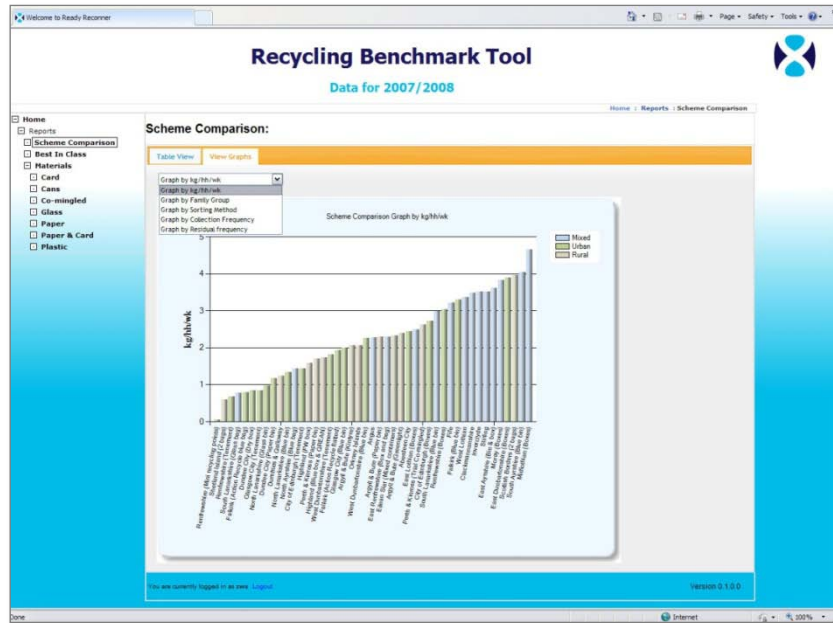
1. Ready Reckoner;
2. Analysis of the Top Ten Recycling English Councils.

#### *1. Ready Reckoner*

The Ready Reckoner is an online tool based on data provided by Scottish Councils and the analysis conducted by Remade in the Annual Kerbside Best Practice Report. It allows Scottish Councils to compare and benchmark both by tables and by graphs the capture rates of their recycling schemes with other Councils in a variety of ways including by:

- Recovery Rate – kg/hh/wk
- Council type (Urban, Rural, Mixed)
- Sorting method;
- Collection Frequency of both Recyclate and Residual waste;
- Material
- Best in Class





**Figure 1 – Screenshot from the online ‘Ready Reckoner’**

The tool may be of particular use to Councils looking to improve their services or to identify the impact of including additional materials or collections and to estimate the expected increase in performance such changes might bring. Of particular note the data from the tool was used as a baseline in the Council support provided to both East Renfrewshire Council and City of Edinburgh Council who wished to examine the potential for their schemes improvement and enhancement.

All Scottish Councils can access the tool via the Remade website using a simple login process.<sup>3</sup>

## *2. Analysis of Top Performing English Councils*

A number of Scottish Local Authorities requested a package of work surrounding the investigation of potential areas for improvement as demonstrated by English local authorities with high recycling rates. This report highlighted what are thought to be the main contributing factors of the highest performing collection authorities in England.

The report is also available at the Remade website.<sup>4</sup>

<sup>3</sup> <http://www.remade.org.uk/news--events/council-benchmarking-tool.aspx> - checked April 2010

<sup>4</sup> [http://www.remade.org.uk/media/16912/top\\_ten\\_english\\_las.pdf](http://www.remade.org.uk/media/16912/top_ten_english_las.pdf) - checked April 2010

## 2.2. Individual Council Support

This part of the programme was based on a Councils individual objectives and needs providing more direct assistance. Discussions were held with each of the Councils that took up the offer of assistance specifically to identify the data required for any analysis to be undertaken. Assuming suitable data was readily available Remade was able to suggest different types of analysis it could carry out for the Councils. This included the following:

### *Review the Current Kerbside Dry Recyclate Collection Service*

Across any of the council's existing recycling schemes, a programme of support could include examining:

- *Operational Data* - describing how many households are on each daily route, the housing type, and general indicators of social demographic significance;
- *Input performance* – data describing how well the public engages with the council's recycling scheme, including participation or set-out rate;
- *Output performance* – analysis of tonnage captured through each daily route to determine kg/hh/wk by daily route and across the council area.

### *Identification of Areas of Potential Enhancement*

For existing services and in particular low performing daily routes, Remade and the Council would identify areas for enhancing recycling services. This might be by providing a reusable methodology for identifying where the opportunities for improvements exist.

### *Opportunities for Additional, New or Innovative Services*

The opportunities for direct performance improvements and enhancement to the existing services (e.g. adding extra materials, altering frequency, expanding the households) could be evaluated to estimate their impact on recycling rates as well as the identification and evaluation of opportunities to add new services (e.g. food waste, segregation / processing of bulky uplifts, kerbside collection of glass vs recycling point services)

## 3. Councils Supported

The following section provides a brief description of the support provided to each of the Councils who requested assistance through the Recycling Optimisation Programme.

### 3.1. Aberdeenshire Council

### *Summary of Assistance*

Aberdeenshire Council is undergoing a review of its kerbside services to identify opportunities to improve the service both operationally but also to maximise the tonnage diverted from landfill. Options being examined, subject to funding and resources available, include but are not limited to:

- Extending to all urban households the current trial weekly kerbside food and dry recycling;
- For all rural households, the move to a fortnightly residual plus food waste collection.

In order to achieve this the Council will need to undertake a re-routing exercise of residual waste routes that previously served both urban and rural households to routes that serve either urban or rural households.

Therefore Remade provided the Council with an appropriate methodology to assess the performance of the current kerbside recycling service day routes in the Southern district of Aberdeenshire. The Council can then replicate this methodology at a later date to other districts in Aberdeenshire.

### *Data Analysis / Work Undertaken / Data Requirements*

In the project the aim was to provide an assessment method for the 29 kerbside dry recycling day routes. The assessment of tonnage, route, set-out and GPS data for each day route could consider factors such as:

- Average tonnage of recycle collected;
- Average number of loads;
- Average time active / idle;
- Distance travelled.

The results of the analysis can then be compared to available benchmarks and assumptions (e.g. crewing levels, working hours, loading times, collection times, and driving times). This will allow the Council to assess day route performance in a wider context and, hence, identify day routes with spare capacity and recommend appropriate resource levels for the existing service along with any cost savings.

### *Outcomes / Results*

A methodology summary was provided to the Council. This work is still underway (April 2010).

## 3.2. Argyll & Bute Council

### *Summary of Assistance*

The Council wished to better understand the impact of introducing a kerbside glass collection service within the Helensburgh area. It wanted to know how this new service would increase the Councils overall recycling rate and if there was a likelihood that the total amount of glass captured at the recycling points would fall.

The Council is also currently working on identifying resource efficiencies within the various recycling and waste services. These efficiencies together with several direct financial budget savings, in the preparation of its waste management budget for 2010/11, and the costs for the new kerbside glass collection service were incorporated into a data model. The Caledonian Environment Centre was able to examine the impact of introducing these efficiencies and the new glass service both in terms of financial and recycling rate totals against 2009/10 comparative totals.

### *Data Analysis / Work Undertaken / Data Requirements*

Of particular interest was the analyses of the effect of kerbside glass collections on the amount of glass captured at bring sites. The data in the table is produced using SEPA Waste Dataflow Data for the year 2007/08. It can be seen that those with kerbside glass collections on average collect at least 0.58kg/hh/wk more glass than those without kerbside glass collection services. However it also shows that the average yield for recycling points is approximately 35% lower. The 0.71kg/hh/wk is the average yield for all kerbside glass collections regardless of council type (e.g. rural, mixed or urban), collection containment and residual waste collection frequency. However it should be noted that analysis of Councils with fortnightly residual waste collections and kerbside glass collections (mainly mixed and urban type authorities) show the average yield of kerbside glass for these Councils to be 71% higher at 1.14kg/hh/wk.

It also appears that a council's residual waste collection frequency does not have a significant impact on the average yield of glass captured at recycling points.

**Table 1 – Average Glass Capture Rates in Councils with and without Kerbside Glass Collection Services**

	Councils WITH Kerbside Glass	Councils with NO Kerbside Glass
<b>Yield of Recycling Point Glass</b>	0.23 kg/hh/wk	0.36 kg/hh/wk
<b>Yield of Kerbside Glass</b>	0.71 kg/hh/wk	n/a
<b>Total Yield</b>	0.94 kg/hh/wk	0.36 kg/hh/wk
<b>Difference</b>	0.58 kg/hh/wk	

### *Outcomes / Results*

A summary within a larger report was provided to the Council showing the impact of the changes when compared to 2009/10 totals.

### 3.3. East Renfrewshire Council

#### *Summary of Assistance*

East Renfrewshire Council requested an options appraisal regarding forthcoming service improvements which would be designed to meet the 2013 target of 50% recycling and composting of Municipal Solid Waste.

The options assessed included:

- a fortnightly residual waste collection (residual waste is currently collected on a weekly basis)
- a fortnightly combined food and garden waste collection (garden waste only is collected nine months out of the year)
- a weekly combined food and garden waste collection
- changing the existing dry recycling service from:
  - a fortnightly box and bag collection of paper & card, glass and cans
  - a monthly bag collection of mixed plastics (to some households)

to:

- a fortnightly collection of co-mingled glass, cans and mixed plastics in a 240l bin
- a fortnightly collection of segregated paper & card.

#### *Data Analysis / Work Undertaken / Data Requirements*

East Renfrewshire Council provided details of their current kerbside recycling schemes including information on numbers of households served and tonnage captured in quarters three and four of 2008/09 and quarters one and two of 2009/10. This data along with data collected as part of the Remade Scotland 2007/08 Recyclate Recovery Report was then used to inform predictions of expected tonnages across the various options.

#### *Outcomes / Results*

A summary within a larger report was provided to the Council showing the details of the options examined

Depending on the exact specification of the service the Council could expect to increase its overall recycling rate by between 3.5% and 14.2%. All of which are further dependant on the option examined, resources and funding available and householder participation.

A move to a fortnightly residual waste collection shows that 4.3% could be added to

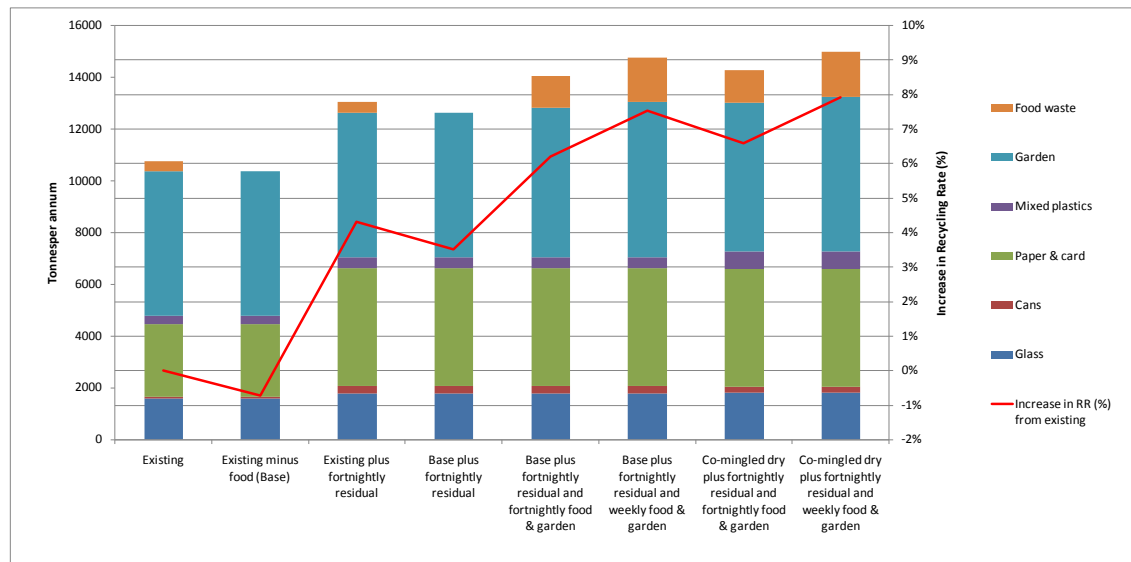
the overall recycling rate if implemented with the current service.

Introducing a fortnightly food and garden waste service shows an increase in overall recycling rate of around 2.7% could be expected compared to the existing garden waste only collection (having ceased the food waste trial).

It is less certain exactly how much the recycling rate would benefit from a move to a weekly food and garden waste collection. The best estimate suggests an increase in recycling rate from the fortnightly service of around 1.3%.

A much smaller increase in recycling rate (around 0.4% at average performance levels) is thought likely were the Council to opt for a co-mingled collection of glass, cans and plastics although a definitive estimation of the impact has been difficult due to a lack of examples with glass collection. It is, therefore, likely that operational and cost issues would be investigated before it is fully understood if this option is worthwhile.

**Figure 2 - Kerbside collection options with 'average' expected annual yields**



### 3.4. City of Edinburgh Council

#### *Summary of Assistance*

In discussion with the City of Edinburgh it was agreed to undertake an options appraisal of the kerbside box collection service. The options assessed included:

- Reviewing the potential improvements in the box service in terms of performance comparison to other Scottish box recycling systems and also average recycling capture rates in general.
- Reviewing the potential impact on recycling rate by switching from a box to bin kerbside collection service.
- A high level cost summary of the likely costs for the Council to deliver each service including the current kerbside contract.

This report, therefore, aimed to assess these options in terms of their impact on recycling tonnages and high level service running costs.

#### *Data Analysis / Work Undertaken / Data Requirements*

City of Edinburgh Council provided details of their current kerbside recycling schemes including information on numbers of households served and tonnage captured up to 2008/09. The Council also provided vehicle information including high level costs, mileages, load volumes, route performance and household information for the different vehicle types. For the purposes of this report this data will be referred to as “recent data”. This data along with data collected as part of the Remade Scotland 2007/08 Recyclate Recovery Report was then used to inform predictions of expected tonnages and collection costs across the various options.

In modelling the effect on kerbside recycling yields for different options, yield figures were extracted from the 2007/08 data for Council schemes which operate a similar service. Average yields of similar schemes (i.e. similar materials and container type) at other Scottish Local Authorities were then used to inform the modelling of potential yields at City of Edinburgh.

Projected performance (in kg/hh/wk) by material was derived in two ways:

- Optimum by material from all similar type schemes.
- Average by material of all similar type schemes.
- Average by material of all schemes regardless of type.

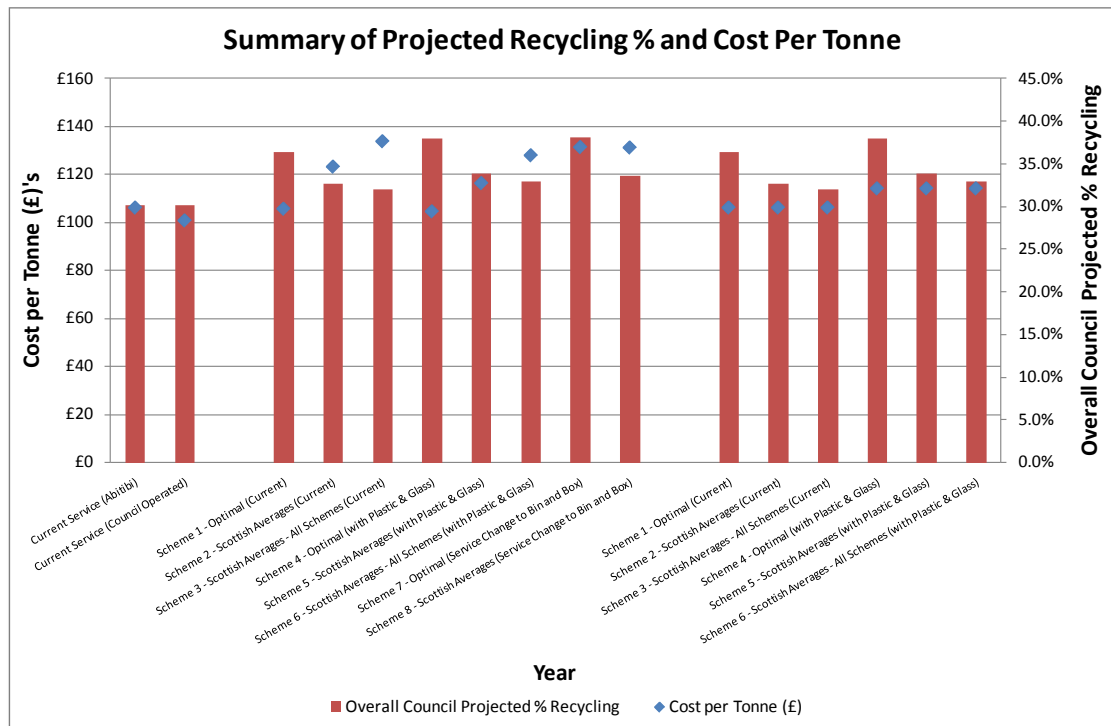
The “average” performance was calculated as the average yield for each material of schemes with a similar box collection system to Edinburgh. The optimal figure is the highest individual material yield from any scheme with a similar box collection method (where possible).

## Outcomes / Results

A summary within a larger report was provided to the Council showing the details of the options examined.

The options examined projected recycling rates for the Council between 32% and 38% all of which are further dependant on the option examined, resources and funding available and householder participation.

**Figure 3 – Summary of Projected Recycling % and Cost per Tonne**



- The Council's current kerbside recycling service performs well and amongst its own family type (Urban) in 2007/08 is the fourth highest of 18 Urban kerbside recycling collections.
- However in terms of box collection systems there are still potential areas to improve the capture. In 2007/08 the average capture for a kerbside box collection service was 3.03kg/hh/wk.
- Several options were projected in this report some of which added additional kerbside materials for collection. However in order to achieve the highest rates possible the Council should increase the recycling collection to weekly and reduce the residual waste collection to fortnightly.
- Additional resources will be required if additional materials be added for capture. Particularly for collection of plastic in the kerbside box service as the total route vehicle volume capacity available in the current fleet would be exceeded in many of the options examined.



### 3.5. Fife Council

#### *Summary of Assistance*

Fife council recently undertook a trial of a mixed food/garden waste collection service to about 5,500 households. Part of assessing the impact of the trial involved compositional analysis of the amount food and garden waste collected. The Council therefore requested a short review of the analysis work being undertaken by the council, together with the subsequent analysis being undertaken to derive performance of each trial scheme.

#### *Data Analysis / Work Undertaken / Data Requirements*

The compositional analysis provided information on:

- % of food waste contained in the sample for that day
- The average kg/hh/wk collected from the sampled households

Overall the Council was accurately recording data, and aware of the variability in the figures from various variable factors.

#### *Outcomes / Results*

A summary report was provided to the Council

### 3.6. Glasgow City Council

#### *Summary of Assistance*

Glasgow City Council (GCC) asked the Caledonian Environment Centre to provide a high level analysis of the impact on recycling levels, landfilled tonnage and also the financial implications of moving to a 'Managed Weekly' collection of waste and recycling. This would typically involve providing a collection of the recycling (blue bin) on one week and the residual waste (green bin) on the other week.

#### *Data Analysis / Work Undertaken / Data Requirements*

Part of the analysis for this work is based on examining the impact of the fortnightly residual collection on the modelling carried out for Glasgow City Council in the report by the Caledonian Environment Centre "Glasgow City Council Recycling Performance Report". In this larger piece of work the Baseline scenario was a snapshot of the Councils current waste management and recycling services at the time of the original report and the Baseline Plus scenario included several recycling and waste management improvement estimated to increase recycling to around 33%.

#### *Outcomes / Results*

A summary report was provided to the Council showing the impact both financially and in terms of recycling rate the impact of introduction of a fortnightly residual service might have on single type properties in Glasgow.

Based on the previous work carried out the Centre modified the model to output summary results based on the Council moving to a fortnightly residual collection for single properties. This was done for the Baseline and Baseline Plus models. The implementation year chosen was 2011/12 and it showed that due to the extra resources (staff time, staff support, education / promotion) the Council will not see any savings in year 1 (2011/12) however it might see some efficiency savings in year 2 onwards (2012/13). This is a typical result for most authorities increasing recycling and reducing residual frequency collections. As the cost of landfilling and landfill tax continues to rise the savings may become even more significant.

### 3.7. Midlothian Council

#### *Summary of Assistance*

As part of the recycling optimisation programme Midlothian Council requested an evaluation of activities at its Recycling Centres (RCs). The Council have the highest kerbside recycling rate in Scotland and are now focusing on other areas of its service where recycling performance can be improved.

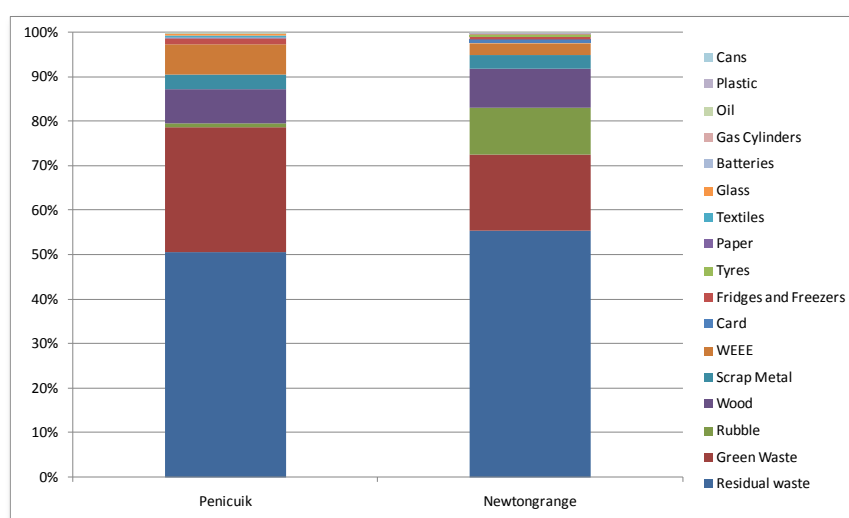
The Council has recently introduced increased provision for recycling at its two RCs in Newtongrange and Penicuik. The RC in Penicuik is situated on a much smaller plot of land than the Newtongrange site; it is generally understood that the size of the plot limits any potential improvement in performance of the site. The main focus of this study was, therefore, the site at Newtongrange where the Council hopes to significantly increase performance. An extensive renovation of the Newtongrange site was completed in December 2008 but is perceived to underperform compared to some other RCs in Scotland.

At the time of the evaluation comparative data across all the local authorities was only available up to March 2009<sup>5</sup>. Therefore, a large part of the background evaluation and comparisons with other councils has necessarily had to pre-date the renovation at Newtongrange. Such analysis, however, does give a good impression of expected performance at similar sized sites at Councils with similar characteristics to MC.

#### *Data Analysis / Work Undertaken / Data Requirements*

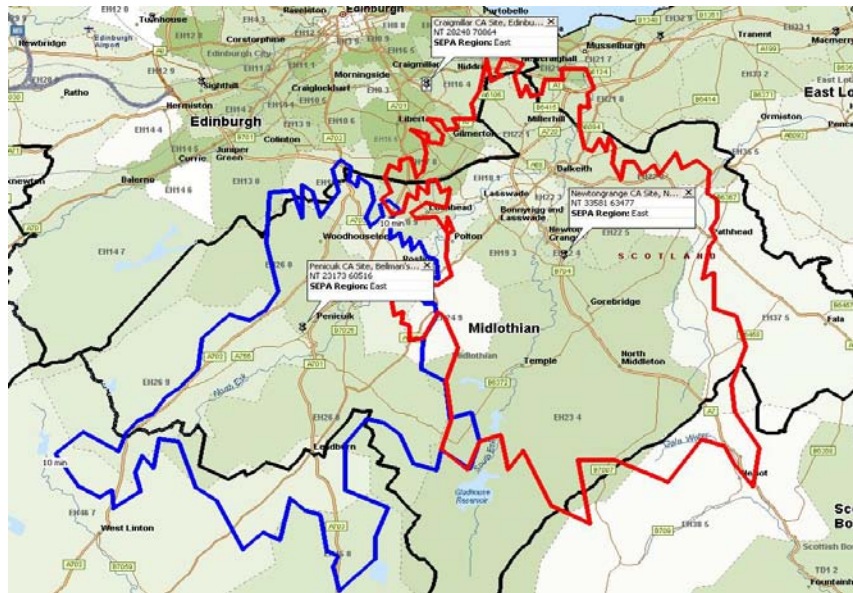
In order to best understand the performance of Midlothian Councils Recycling Centres it is useful to compare it against a number of areas including:

- **Performance** – Compare to similar Councils (Stirling and East Ayrshire Councils matched Midlothian in terms of frequency of residual waste collection, stance towards commercial waste and Council family group)



<sup>5</sup> Latest WasteDataFlow data was for the year 2008/09. Licensed site return data was only available for 2008. MC provided licensed site return data for their RCs up to September 2009.

- **External Factors** – Residual waste frequency, centre density, utilisation by local population, commercial waste controls



- **Site Based Factors** – Site infrastructure, staffing levels, signage / layout, accessibility, reuse.

### *Outcomes / Results*

A report with recommendations was provided to the Council. The recommendations included; compositional analysis of the residual waste element, staff training, additional signage and public education and information.

### **3.8. West Dunbartonshire Council**

#### *Summary of Assistance*

In order to provide support to West Dunbartonshire Council in implementing an alternate weekly collection of residual and recycling waste, the Council is going to monitor recycling and residual waste routes and to provide recycling support to householders.

Therefore Remade provided the Council with an appropriate survey methodology to undertake this work.

#### *Data Analysis / Work Undertaken / Data Requirements*

The survey will capture data on the following:

- Bin presentation numbers
- Contamination levels
- Overflowing bins / Side waste levels

It will also be an opportunity to provide householders with information if there bin contains contamination or the wrong materials.

This work is still ongoing (April 2010).

#### *Outcomes / Results*

A methodology summary was provided to the Council.

### 3.9. West Lothian Council

#### *Summary of Assistance*

West Lothian Council manages nearly 110,000 tonnes of Municipal Solid Waste each year. The waste is presented by householders and commercial customers in many different ways: kerbside collection of recyclates and residual waste, at CA sites, bring sites. At the same time the council has numerous arrangements with private contractors for recycling, treatment or disposal of that waste. If the Council has played a role and if the waste considered is managed by or on behalf of the Council, then the waste stream counts towards the Council's MSW.

For several years UK Councils have reported this waste through the WasteDataFlow system – a web based set of questionnaires which are then analysed by SEPA for Scottish Local Authorities to balance off the waste arisings, to determine the Council's BMW to landfill against an allowance, and to report on the councils recycling performance.

In response to WDF, West Lothian Council has developed its own approach to managing its waste data, based on Excel spreadsheets which are linked to determine the values for inclusion in WDF questions.

Each year additional questions have been introduced, and this has led to adaptations to the waste data system used. However, the initial difficulties which many councils experienced in relation to WDF have largely diminished, and most Councils including WLC, now manage to go through the WDF process without too much difficulty.

#### *Data Analysis / Work Undertaken / Data Requirements*

This work set out a review of the waste data tool used by the Council in the context of the wider information needs of the Council and the specific requirements of WDF. West Lothian Council manages nearly 110,000 tonnes of Municipal Solid Waste each year. The waste is presented by householders and commercial customers in many different ways: kerbside collection of recyclates and residual waste, at CA sites, bring sites. At the same time the council has numerous arrangements with private contractors for recycling, treatment or disposal of that waste.

#### *Outcomes / Results*

A summary report with recommendations was provided to the Council.

## **4. Other Councils / Ongoing Work**

There are a number of ongoing discussions with Highland, Perth & Kinross, North Ayrshire and South Ayrshire Councils about how they might be able to best use the programme to assist them. It is hoped that these Councils and others will be helped throughout 2010/11 as part of the Caledonian Environment Centres contribution to the Zero Waste Scotland programme.