

**Strategic Overview
of the
Waste Prevention Planning Project
Within Scottish Local Authorities**

**Report to

The Scottish Government**

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within Scottish Local Authorities

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Executive Summary

In November 2004 the Minister for the Environment and Rural Development, established a fund to support Local Authority (LA) internal waste audits and waste prevention action plans. In response to this announcement, a number of councils proposed to deliver a waste audit across each of the council's services with a view to producing a waste prevention plan, with achievable waste prevention targets, over a 12 month period.

Remade Scotland offered a management and support programme to all Local Authorities (LAs) to facilitate the delivery of this scheme. Twenty-one of the 32 LAs elected to participate in the Remade Scotland programme and this report presents the overarching results of the waste review process within these Authorities.

Data obtained from these Authorities suggests that the internal activities of all 32 LAs in Scotland generate approximately 118,000 tpa of municipal solid waste (MSW), exclusive of green waste and roads' waste. This represents between 2% and 4% of total MSW arisings in Scotland and equates to 488 kg/full time equivalent (FTE)/annum or 24 kg/capita/annum. The average composition of this waste stream is shown by the chart below.

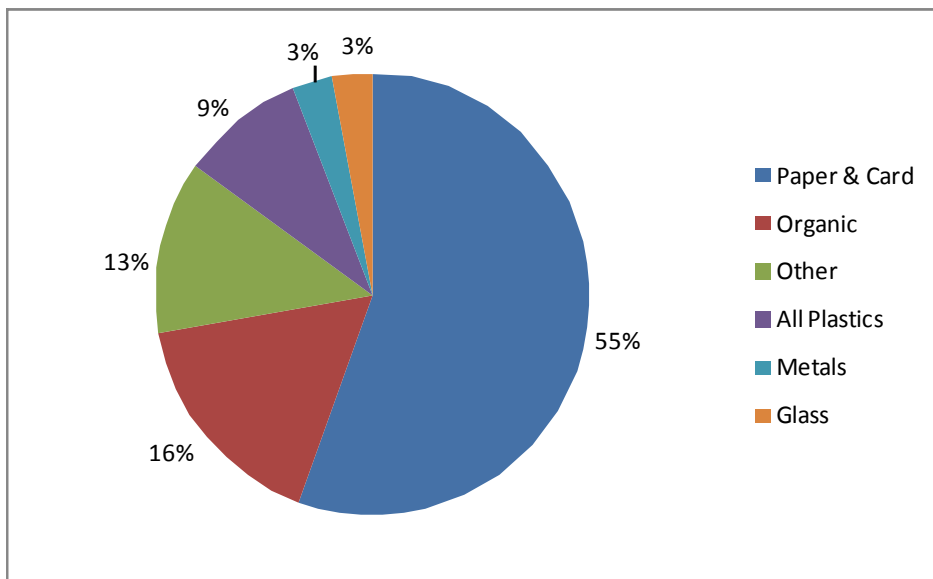


Figure 1 Average waste composition of MSW arising in Scottish Local Authorities (NB Due to rounding errors totals may not add up to 100%)

Arisings were grouped by LA premises, with schools generating approximately 60% of arisings (c. 71,300 tpa), followed by community, culture and leisure (CCL) facilities, which generate approximately 13% of arisings (c. 15,600 tpa), offices, with 11% (c. 12,700 tpa), care homes and social work (CHSW), with 7% (c. 8,400 tpa) and 9% (c. 10,500 tpa) by a range of 'other' facilities that did not fit in any of the previous classification (e.g. workshops).

Coupling composition information with the estimate of LA MSW arising suggests that the greatest impact will result from initiatives focusing on paper and card (c.59,000 tpa, which is equivalent to 52% of total LA MSW arisings), followed by organic waste (c.17,500 tpa, which is equivalent to 10% of total LA MSW arisings).

Targeting initiatives at the most prevalent waste streams will enable LAs to derive savings from avoided disposal costs, as well as from reduced procurement costs and freed staff time.

Specific waste minimisation and recycling initiatives are explored for the five main waste streams on a departmental and authority wide basis, showing that there are many opportunities for Scottish LAs to both reduce their waste arisings and their reliance on landfill as the main disposal option.

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Introduction & Background

Introduction

The process of waste audits is well established as there has been a significant amount of work undertaken to support the private sector this includes work by SEPA's Waste Minimisation programme, the various local Environmental Business clubs, the Business Environmental Partnership, the Resource Efficiency Environmental Forum and Envirowise.

In 2005, The Scottish Government allocated a further £2 million from the then available Strategic Waste Fund to support Local Authority (LA) internal waste audits and the production of Audit Reports and Waste Prevention Action Plans (Action Plans) with funding up to a maximum of £62,500 for each LA.

Although well established in the private sector, a structured approach to waste minimisation within Councils is new as individual authorities have different levels of experience and knowledge in waste auditing and prevention. Additionally, LAs must be consistent in their approach and indeed integrate this initiative within their corporate objectives.

For these reasons, Remade Scotland offered waste management expertise to assist in delivering this project and worked with 21 of Scotland's 32 LAs to carry out waste audits and develop individual waste minimisation strategies. This involved a detailed waste audit of LA premises to establish baseline waste arisings and to gain insight into the relationship between waste generation and working practices within each organisation.

With these data sets, Remade was then able to work with each LA involved in the project to develop an Action Plan that comprised resource requirements, departmental communication, audit staff training, data measurement and analysis and the maximisation of waste/materials recycling options. Of particular importance to the success of the Action Plans was to ensure that senior management within LAs supported work on internal waste minimisation, so that actions could take place across departments

This report reviews the various LA municipal solid waste (MSW) Audit Reports and Action Plans, provides an overview of sources and quantities of municipal solid waste arising in Scottish LAs' operations (LA MSW) and explores opportunities for managing this waste stream further up the waste management hierarchy.

Waste Audits

An audit is "a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled".¹

¹ ISO 19011:2002 Guidelines for Quality and/or Environmental Systems Auditing

In more general terms, a waste audit is a process for evaluating waste management practices within an organisation and can be used to highlight areas with potential for reducing or recycling waste and ensuring compliance with environmental and waste management legislation and the organisations own internal policies.

Achieving these objectives requires the collection of detailed information about waste arisings within the organisation, how it is managed and its fate if it leaves the organisation. Waste audits can be incorporated into an organisation's overall wider Environmental and Quality Management Systems (EMS & QMS).

Although the funding provided an opportunity for LAs to review all their operations, it was acknowledged, that where this was not possible within the funding timeframe, audits were to focus on main buildings and activities of the Local Authorities such as offices, education, leisure, libraries etc.

An outline of the audit process delivered to the LAs participating is given in Appendix 1.

Data Sources & Methodology

This report provides an overarching picture of waste management practices across Scottish LA premises based on the individual Audit Reports and Action Plans produced for the LAs benefiting from Remade Scotland's assistance.

Identifying LA Premises

To simplify the process, and facilitate comparisons and identification of trends, each LA audit grouped similar properties and services together. However, across the 21 local authorities, the composition of these groups varied and in general tended to reflect each LA departmental structure, so to facilitate this review, premises were further grouped into one of the following five categories:

- Schools
- Community, Culture and Leisure
- Care Homes and Social Work
- Offices
- Other (e.g. workshops)

Identifying Waste Types

Although each auditor categorised their LA MSW arisings into distinct fractions, for the purpose of this review, individual LA MSW arisings were further grouped into one of six categories:

- Paper and Cardboard
- Plastics
- Metal
- Organic
- Glass
- Other

Ideally a more detailed breakdown that distinguished between paper and cardboard, should be used, but this was constrained by the way individual LAs reported their arisings.

'Other' refers to waste that could not be easily identified or whose arisings were so small that it would not be practical to list. This type of waste is also often referred to as 'residual waste'.

Notwithstanding this, the available data and waste categories do provide a useful starting point for understanding the overall nature of LA MSW.

Calculating National LA MSW Arisings

Data availability and comparability restricted the calculation of national LA MSW arisings to the extrapolation from data for only 15 LAs participating in Remade Scotland's support programme.

Number of employees, as full time equivalents (FTE), and population size per authority were the common denominators for all LAs that could facilitate the estimate of total LA MSW arisings in Scotland (Table 1).

Local Authority	LA MSW (tpa)	FTE	Population
Argyll & But	4,152	4,252	91,306
Dumfries & Galloway	2,165	6,140	147,765
East Dunbartonshire	1,568	4,270	108,243
East Renfrewshire	1,386	3,734	89,311
Glasgow City	20,328	31,832	577,869
Highland	2,950	9,613	208,914
Inverclyde	2,380	4,003	84,203
Midlothian	1,407	3,487	80,941
Moray	1,786	3,667	86,940
North Ayrshire	2,538	6,023	135,817
North Lanarkshire	7,836	15,197	321,067
Orkney Islands	703	1,510	19,245
Renfrewshire	3,904	7,802	172,867
South Ayrshire	2,255	5,008	112,097
West Dunbartonshire	2,241	4,828	93,378
Total (for Scotland)		229,869	5,062,011

Table 1 List of local authorities with comparable waste arisings data

These data (Table 1) were used to calculate an indicator of average LA MSW arising per FTE and per capita (Table 2) that could then be extrapolated to provide a national estimate of total LA MSW arisings.

	Kg/LA MSW/FTE/annum	Kg/LA MSW/capita/annum
Mean	0.488	0.024
Upper confidence limit	0.575	0.029
Lower confidence limit	0.400	0.019

Table 2 LA MSW arisings per FTE and Capita (with 95% confidence level).

On average, internal LA MSW from this sample of 15 Scottish local authorities is 488 kg/FTE/annum or, if expressed in terms of local authority population, the average is 24 kg/capita/annum.

A national estimate of total LA MSW arisings, based on these indicators, is provided in the following section.

LA MSW Arisings

National LA MSW Arisings

Using the approach detailed in the preceding section, it was estimated that in 2005-06 national LA MSW arisings ranged between 92,000 to 121,500 tpa (Table 3) and that this represented between 2.69% and 4.22% of total MSW arisings in Scotland².

Common Denominator	tpa/FTE (Estimate 1)		tpa/Population (Estimate2)	
	tpa	% total MSW	tpa	% total MSW
Mean	112,176	3.28%	121,488	3.56%
Upper confidence limit	132,175	3.87%	144,267	4.22%
Lower confidence limit	91,948	2.69%	93,647	2.74%

Table 3 Estimates for total LA MSW arisings in Scotland.

The composition for LA MSW, based on data from the Audit Reports, is provided in Figure 2, where it is apparent that paper and card, as well as organic waste, are the two most dominant fractions.

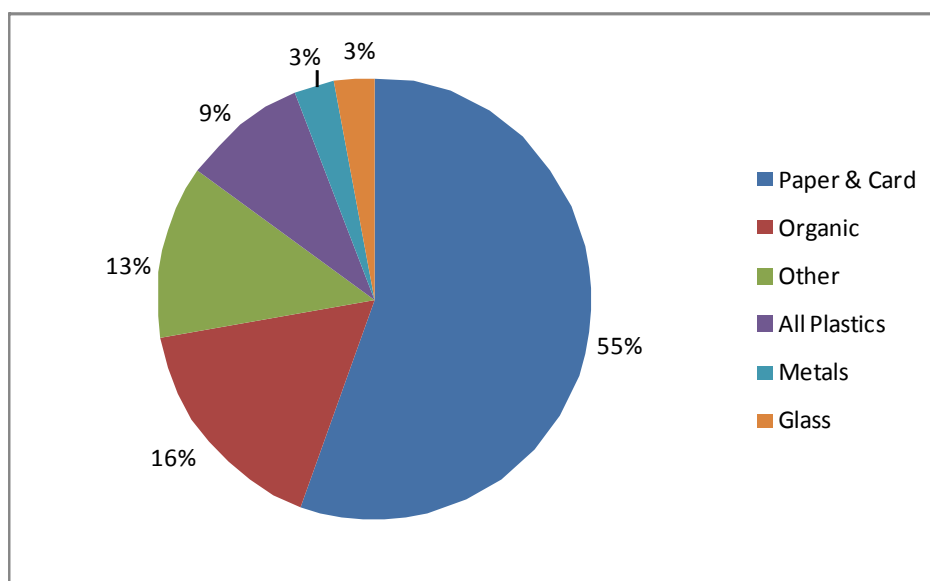


Figure 2 Average waste composition of MSW arising in Scottish Local Authorities (NB Due to rounding errors totals may not add up to 100%).

A more detailed breakdown is provided in Table 4 and, where data was available, in the discussion of individual premises.

² SEPA: Landfill Allowance Scheme Rolling Year Data April 2005 –March 2006.

Premise	Paper & Card	Organic	All Plastics	Glass	Metals	Other
Schools	52.0	18.6	7.8	1.9	2.4	16.0
CCL - Public Halls	14.7	12.4	4.4	59.0	5.1	2.9
CCL - Com. Centres	50.0	7.2	20.5	11.1	6.2	4.4
CCL - Leisure Centres	54.9	10.0	17.1	6.1	6.3	5.6
CCL - Libraries & Museums	69.9	4.7	7.8	2.1	1.8	7.6
Offices	74.0	7.7	7.8	0.9	2.5	4.9
Care Homes & Social Work	52.0	26.0	5.0	9.0	3.0	7.0

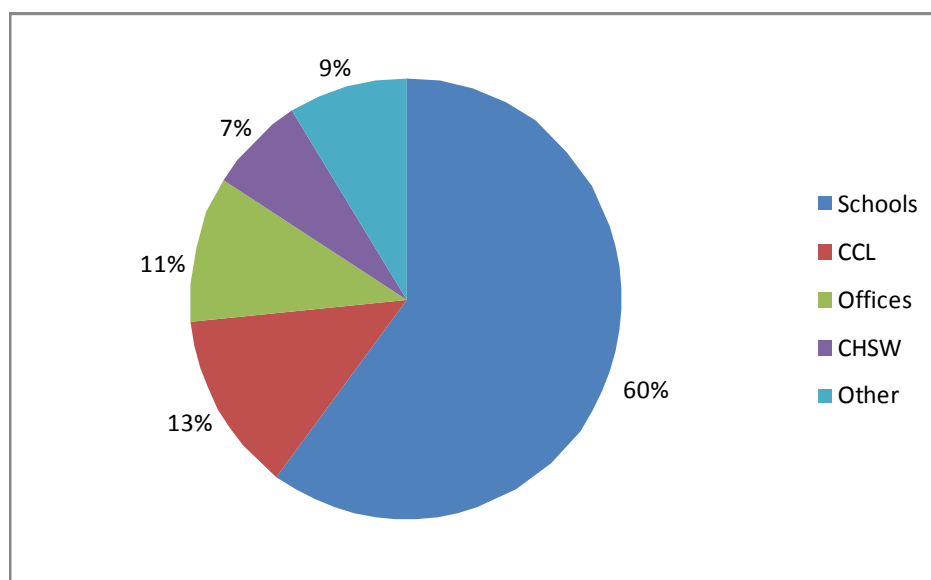
**Table 4 Average LA MSW composition (%) by premise
(NB Due to rounding errors totals may not add up to 100%).**

With the more detailed breakdown of arisings provided in Table 4 it is apparent that, with the exception of glass arising in Public Halls, paper and card and organic waste remains the most prevalent waste streams in the majority of LA premises.

A more detailed analysis of average LA MSW arisings by individual location is provided in the section below.

Arisings by LA Premises

As highlighting areas with potential for improvement is an important outcome of any audit the available data was analysed to determine which LA premises generated the most waste. Figure 3 and Table 5 show that schools generate significantly more LA MSW than all other premises combined.



**Figure 3 Average composition (%) of LA MSW arisings by LA premises
(CCL = Community, Culture & Leisure; CHSW = Care Homes & Social Work)**

Premise	Average % of LA MSW	tpa (estimated)
Schools	60	71,300
Community Culture Leisure (CCL)	13	15,600
Offices	11	12,700
Other	9	10,500
Care Homes & Social Work (CHSW)	7	8,400
Total	100	118,387

Table 5 Estimated LA MSW arisings LA premise

At a strategic level, this level of detail should help target resources and initiatives at particular premises and waste streams. The subsequent sections provide a more detailed assessment of national LA MSW arisings by premise.

School waste

Schools are the LA premises that produce the most waste (nearly 60% of total LA MSW arisings), primarily due to the fact that they have such a high occupancy rate (i.e. over 52,000³ teachers (FTE), other staff and 730,659⁴ pupils in Scotland occupy these premises for 6 hours a day, 5 days a week for 41 weeks per year).

Using the average percentage composition data and estimated waste arisings for all Scottish schools, the amount of the various waste fractions is shown in Table 6.

Waste Composition	tpa	%
Paper & Card	37,399	52.45
Organic	13,502	18.93
Plastics	5,650	7.92
Glass	1,376	1.93
Metal	1,760	2.46
Other	11,612	16.28
Total	71,300	100

Table 6 Estimated arisings School waste in Scotland by average composition breakdown

³ <http://www.scotland.gov.uk/Resource/Doc/933/0039460.xls>

⁴ <http://www.scottishexecutive.gov.uk/Publications/2004/06/19559/39501>

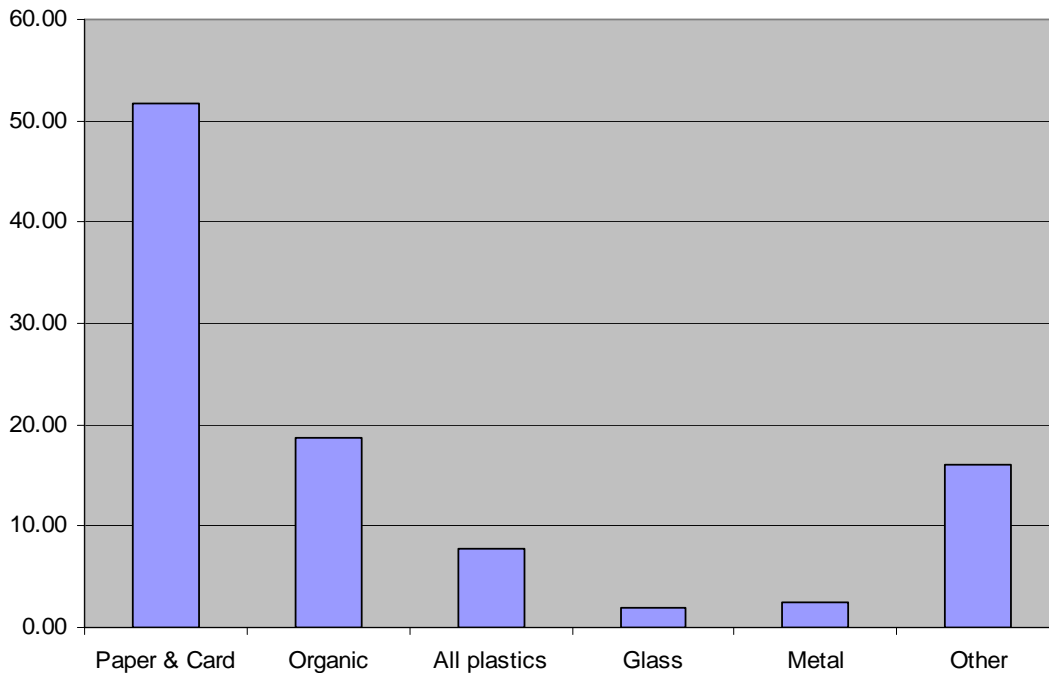


Figure 4 - Average school waste composition (data pooled from fifteen local authorities)

Paper is the largest fraction of school waste arisings, accounting for an average 52% of the waste stream. Reported sources of paper include tutoring material, envelopes, junk mail sent to staff, packaging and paper towels. The proportion of cardboard in waste generated by schools varies greatly between LAs.

The main source of cardboard is packaging material from stationary, PCs, furniture and food deliveries. Many LAs reported that food packaging was the largest contributor to cardboard generation and a number of studies indicated that schools with kitchens generated more waste than those without kitchens (however, this trend is not universal and there are reported exceptions).

The second main component in the Schools' waste stream is organic waste (accounting for an average 19%), primarily as food waste.

Together paper and organic account for approximately 71% of average School waste arisings.

Residual waste ('Other') constituted an average 16% of Schools' waste arisings, representing the third largest component.

The remaining components account for approximately 12% of the waste stream and include plastics and metal waste packaging. A substantial proportion of plastics and metal waste in schools is derived from food packaging, crockery and cutlery.

The Eco-schools programme is a European Union wide initiative for schools that is designed to include environmental issues in the curriculum. There are nine categories⁵ within the programme that schools need to address as they progress through the four award levels.

As schools progress towards the coveted Gold Award, they invariably have to develop and implement initiatives around recycling and waste minimisation.

In Scotland, the programme is well established with over 92% of all schools (2793/3015) registered and 772 having achieved the Gold Award.

The Eco-schools programme in Scottish schools provides an effective mechanism for not only reducing and recycling school waste arisings, but also for raising awareness and participation in domestic kerbside recycling collections.

The LA audits have highlighted the fact that a significant proportion of waste generated in schools could be avoided or recycled: e.g. packaging, disposable cutlery and crockery from catering operations.

Recycling of materials varies widely across Scotland's schools and although good efforts are being made, current levels in many areas are well below the available potential (an example for paper from four LA is provided in Table 7).

Local Authority	Paper Recycled (tpa)	Total Waste Paper (tpa)	% Recycled
Dumfries & Galloway	91.4	680	13.4
Moray	100	219	45.7
North Ayrshire	66.1	1156	5.7
Renfrewshire	65.6	1874	3.5

Table 7 Current levels of paper recycling in Schools in 4 LAs

There appears to be no structured approach to waste minimisation or recycling in Scottish schools, although there is enthusiasm and where successful schemes exist, these have often been initiated by individual schools rather than centrally coordinated.

⁵ Water, Biodiversity, Energy, Global Perspectives, Healthy Living, Litter, School Grounds, Transport and Waste

Community, Culture & Leisure

Community, cultural and leisure centres (CCL), which include public halls, community centres, leisure centres, libraries and museums, generates approximately 16,000 tonnes per annum, equivalent to 13.9% of total LA MSW⁶.

The variability in arisings from CCL (Figure 5) has been attributed to the way these premises, and the services they provide, are organised within different departments in each LA.

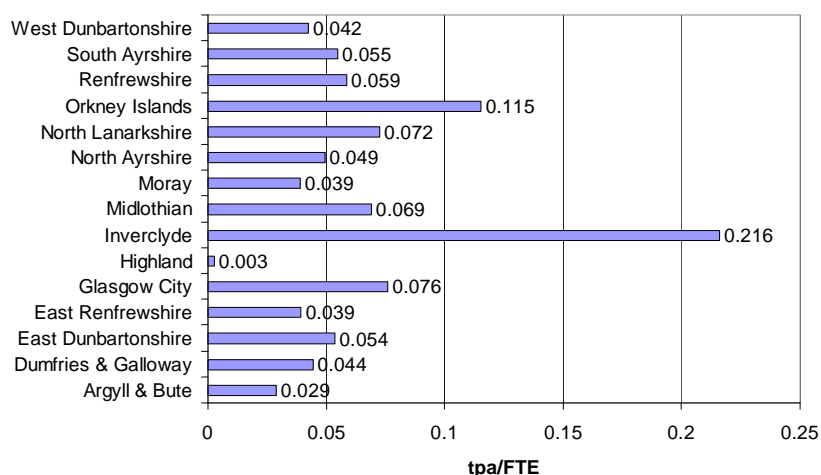


Figure 5 Waste arisings (tpa/FTE) from Community, Culture and Leisure (CCL) premises (based on primary data for 15 LAs)

Several authorities provided individual composition data for arisings from public halls, community centres, leisure centres, libraries and museums. The different functions these premises serve is reflected in the different waste composition (Table 8), e.g. glass, rather than paper and card, is the most prevalent waste stream in arisings from Public Halls. Arisings from these premises will be reviewed individually in the next section of this report.

Premise	Paper & Card	Organic	All Plastics	Glass	Metals	Other
Public Halls	14.7	12.4	4.4	59	5.1	2.9
Community Centres	50.0	7.2	20.5	11.1	6.2	4.4
Leisure Centres	54.9	10.0	17.1	6.1	6.3	5.6
Libraries & Museums	69.7	4.72	7.8	2.1	1.8	7.6

Table 8 LA MSW composition (%) for CCL facilities

⁶ Total LA FTE employees were included to calculate these arisings, as an individual departmental breakdown of FTE was not available. This approach facilitates comparisons between LA.

Public Halls

The composition of waste arising at these premises was derived from data from four LAs⁷.

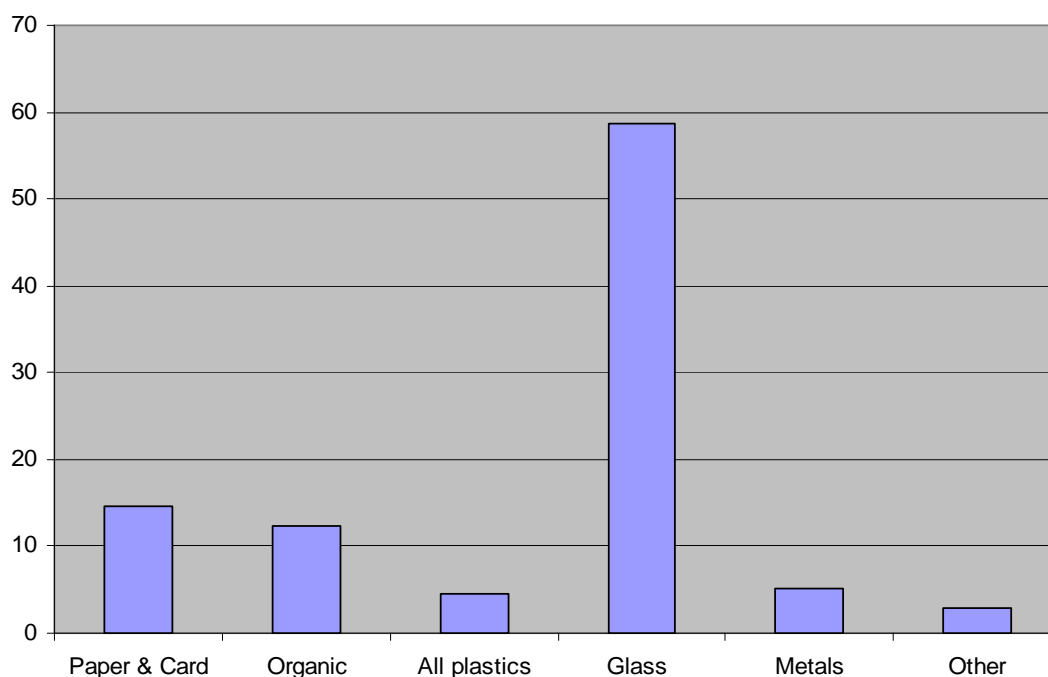


Figure 6 - Average waste composition arising from public halls (data pooled from four local authorities).

Public Halls serve two functions: i) daytime activities and clubs e.g. Weight Watchers, lunch clubs or carpet bowls, and ii) evening functions and events such as weddings. Evening functions generate the majority of waste arisings, but their intermittent nature means that accurate arisings are difficult to calculate.

Glass, arising from catering and bar facilities, is the biggest constituent of the waste stream (accounting for an average 59%), followed by paper and cardboard and organic waste and any waste minimisation or recycling initiatives should target these waste streams.

Catering and bar facilities are provided for those hiring the premises, explaining the prevalence of glass in the waste stream. 'BYOB' parties produce significant volumes of cans, bottles, plastic bottles, plastic cups and glass and therefore the majority of the glass, plastic and metal fractions are mainly beverage containers and drinking receptacles. Facilities for recycling these materials are generally widely available and significant reductions in waste from this sector should be possible and relatively easy to implement.

The catering facilities will generate much of the organic waste i.e. food waste. In some cases caterers opt for disposable crockery and cutlery, significantly increasing the volume of both paper and plastic waste streams. Although food waste can

⁷ Inverclyde, Renfrewshire, North Ayrshire and East Dunbartonshire Councils

generally be composted recycling disposable crockery and cutlery contaminated by food is more challenging.

As these premises are hired out to the public, some LAs felt they had little direct influence over the types of waste generated except for functions provided by their own in-house catering department.

Community Centres

Data for waste arising at these premises was derived from audits carried out by three LAs⁸.

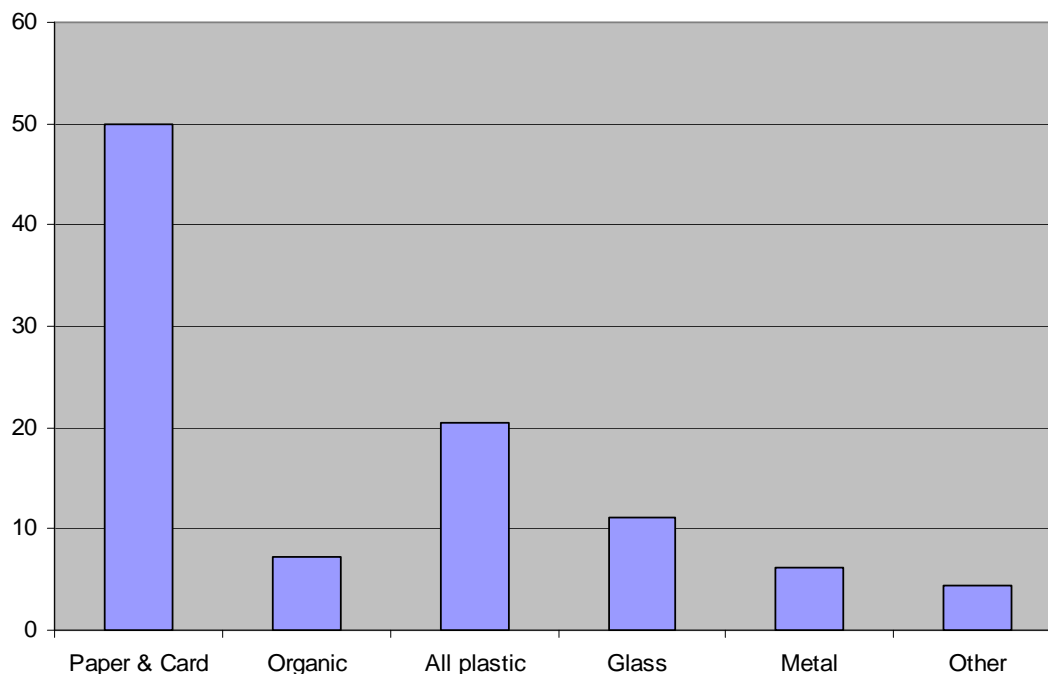


Figure 7 - Community Centres (data pooled from three local authorities).

The largest waste fractions in community centre waste are paper and cardboard (50%) and plastics (20%).

The main source of paper waste includes office activities, leaflets and promotional literature as well as from arts and crafts activities organised for the local community. Paper towels and centre feed towels contribute a substantial amount to the paper fraction, especially if hand driers are not available. Deliveries of stationary, vending machine and other catering supplies are the main source waste cardboard.

Catering waste contributes to the paper and cardboard fractions if the centres have canteen facilities and likewise the plastic and metal fractions arise from beverage containers and receptacles. Youth groups generate a sizeable amount of plastic bottles, sweet and crisp wrappers and cans.

Some community centres have kitchens that produce a large number of meals each day, served in plastic disposable crockery and cutlery.

Although brief, this overview shows that there are opportunities for minimising and recycling waste arising at these premises.

⁸ Moray, Renfrewshire and North Lanarkshire

Leisure Centres

Leisure Centres include swimming pools, sports halls and sports pavilions and the data for waste arisings from this type of premise was derived from audits carried out by five authorities⁹.

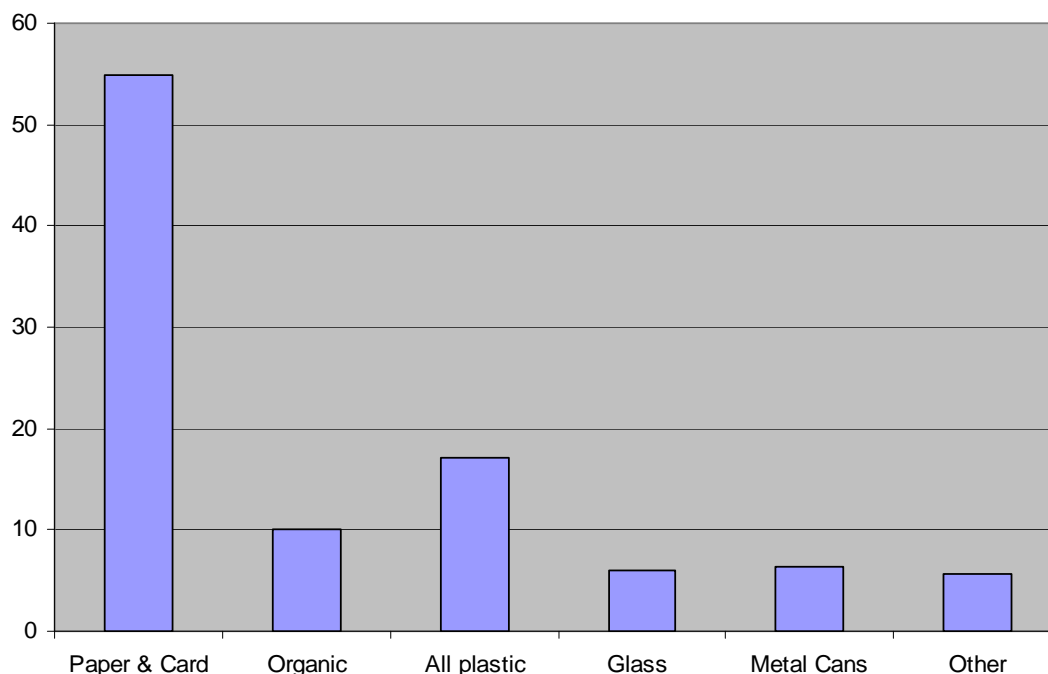


Figure 8 – Leisure Centres (data pooled from five local authorities).

The main waste fraction in leisure facilities is paper and cardboard which on average makes up 54.9% arisings. Centre-feed paper towels which are used in kitchens, lavatories and gymnasias also contribute a large proportion of the paper fraction arising in leisure centre waste. Cardboard generally arises from deliveries of cleaning and catering supplies.

Plastic arisings vary according to the range of facilities available, but generally can include disposable cutlery, plastic drinks and shampoo bottles, and for facilities with swimming pools plastic tubs and drums are also included (for pool maintenance operations).

Other waste arising from catering arrangements at these facilities include paper cups for soft drinks, plastic bottles, cans, TetraPaks, soft plastic drinks containers, plastic cutlery and polystyrene plate, but depend on specific caterer's operating preferences.

⁹ Moray, Renfrewshire, North Lanarkshire, North Ayrshire and East Dunbartonshire Councils

Facilities with swimming pools require Poly Aluminium Chloride (PAC) and chlorine for pool maintenance, which are generally delivered in large HDPE drums. In East Dunbartonshire Council swimming pools require over 100 HDPE drums of Poly Aluminium Chloride and approximately 200 HDPE tubs of chlorine each year. These plastic drums range in size from 5 to 25 litres. In Argyll and Bute some leisure centres return the PAC drums to the supplier after use, whilst in East Dunbartonshire one facility sends around 70 empty PAC drums each year to their Parks Department for re-use. No alternative use has been found for the chlorine tubs which currently cannot be returned to the supplier and is therefore disposed of in the residual waste.

Libraries & Museums

Data from these premises was derived from audits carried out for five authorities¹⁰.

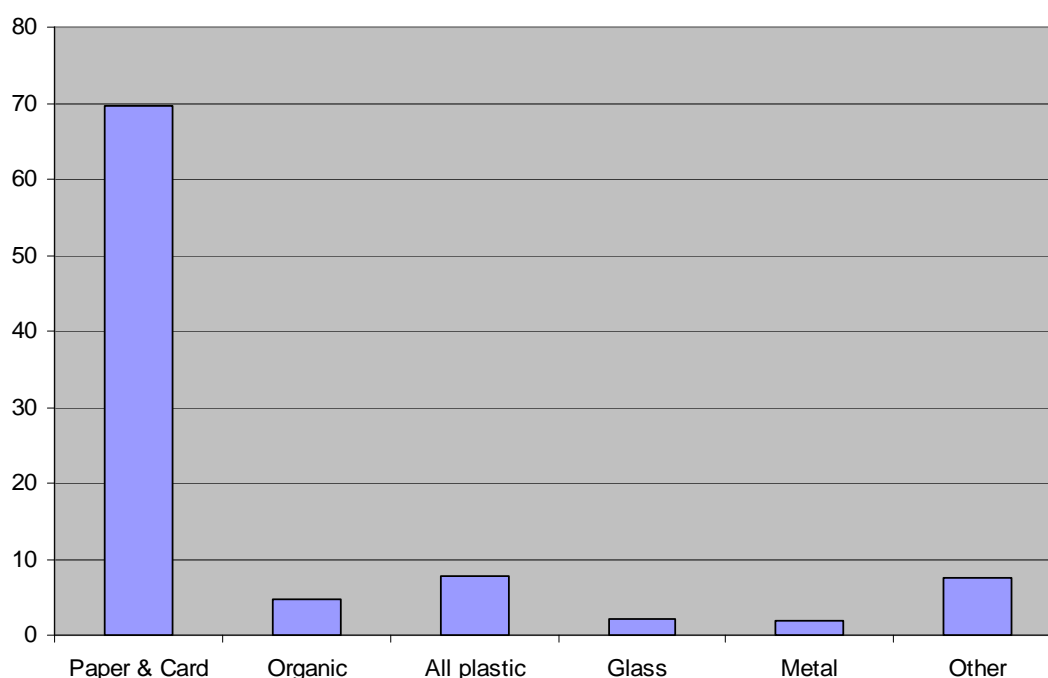


Figure 9 – Libraries & Museums (data pooled from five local authorities).

The bulk of the waste (c. 70%) is paper and cardboard, which arises from office activities (one Audit Report notes that envelopes accounted for 2.5% of waste arisings), old periodicals, paper towels (two Audit Reports noted that paper towels accounted for approximately 25% of the waste arising in these premises), and packaging for office supplies and catering facilities. A high proportion of this waste stream could be recycled or composted.

In many areas employees have already made efforts to reduce waste by reusing paper and cardboard where possible and in some areas, e.g. Moray, libraries have introduced a programme to monitor printing from public computers to encourage users to print only what they need thus saving paper, printer cartridges and equipment. Often staff organises their own recycling efforts such as taking periodicals to local recycling collection points or in some cases, taking waste paper home to be collected via domestic kerbside recycling schemes.

Library books were generally sold to the public, donated to charity shops and in some areas sent to developing countries. However, a large number of books were disposed of as waste as books were not accepted by paper merchants or mills.

¹⁰ Moray, Renfrewshire, North Lanarkshire, North Ayrshire and East Dunbartonshire Councils.

Office Waste

LA office premises produce approximately 12,700 tonnes of LA MSW, which is over 11% of total LA MSW in Scotland. On average this equates to 0.054 tpa/FTE¹¹, although this will vary between the different LAs (Figure 10).

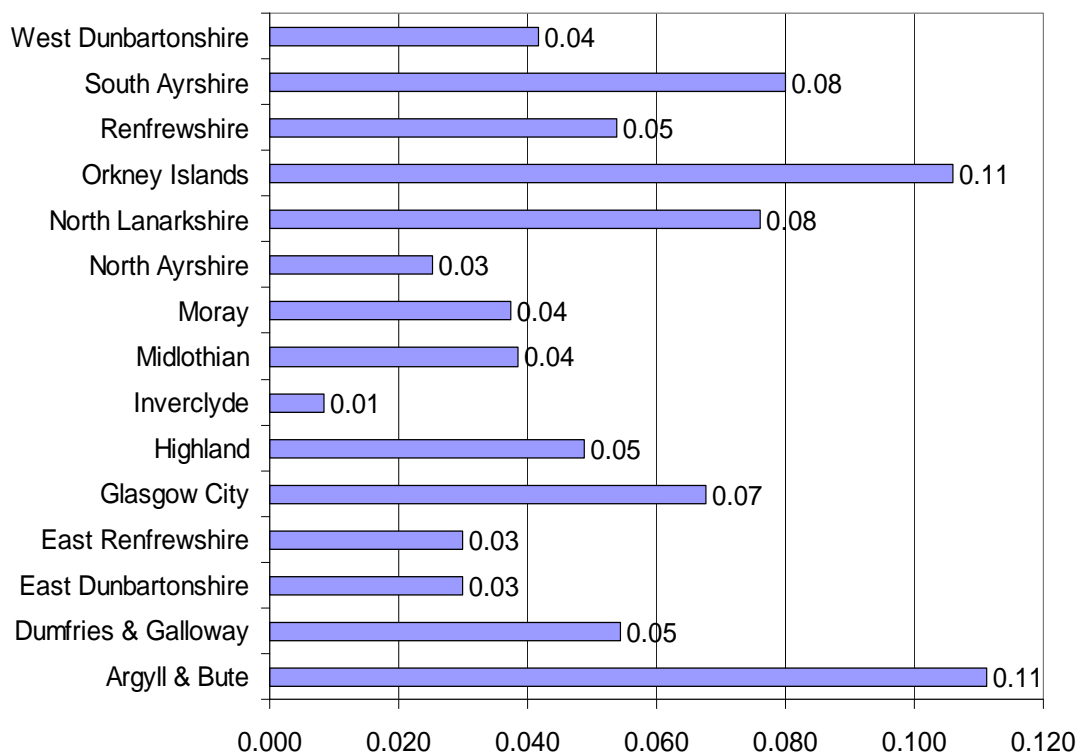


Figure 10 LA MSW arising (tpa/FTE) in LA offices

LA MSW arising in LA offices is dominated by paper (53%) and cardboard (23%) as shown in Figure 11. Two authorities provided a breakdown estimate of paper waste arising in their offices (as detailed in Table 9).

Kitchen and plastics plastic wastes both accounted for approximately 10% of waste arising in LA offices. These waste streams include not only food waste, but also plastic crockery and cutlery, packaging and condiment bags.

Interestingly, for this type of premises several Audit Reports identified IT equipment and printer consumables (e.g. cartridges) as a significant component of the “other” waste stream.

¹¹ Total LA FTE were used to calculate this figure as a departmental breakdown was not available. Using the total FTE also facilitates the comparison between LA.

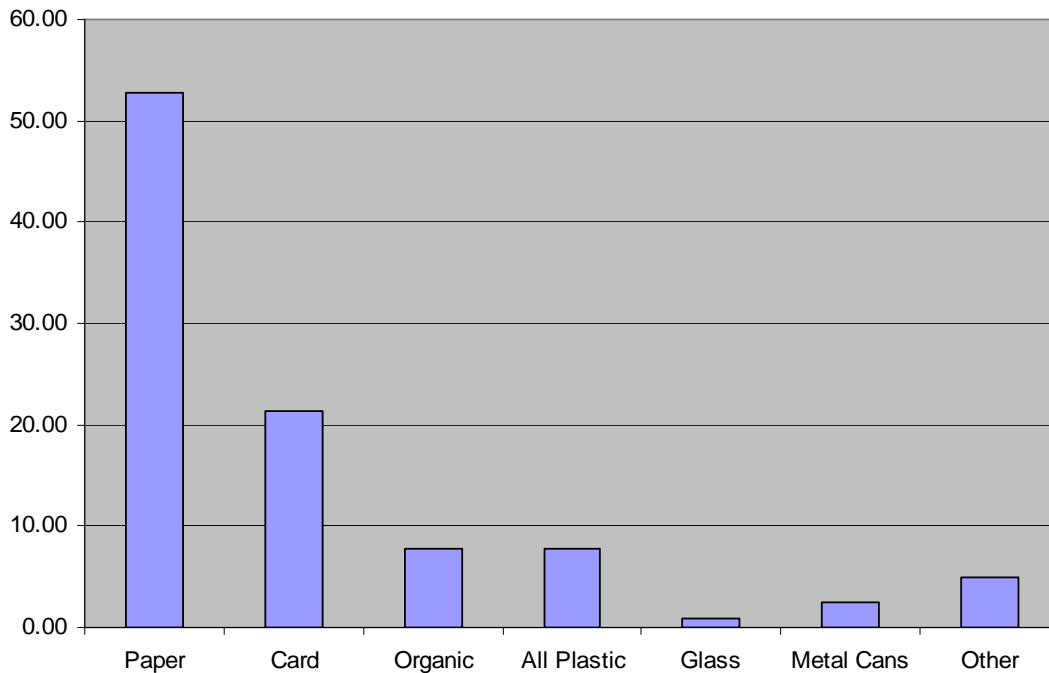


Figure 11 Average composition for LA office waste

Paper Type	LA1 % Composition	LA2 % Composition
Copier paper	45.31	53.78
Envelopes	12.5	9.90
Paper towels	10.93	15.21
Cardboard	18.75	18.48
Other paper	12.5	2.62

**Table 9 Indicative composition of waste paper from LA offices
(NB Due to rounding errors, totals may not add up to 100%)**

Within LA office premises in Scotland there is substantial evidence of unnecessary paper consumption. Raising office staff awareness on the potential for minimising waste paper could help minimise this waste stream: e.g. Argyll and Bute estimated that 20% of paper waste could be avoided through double sided copying.

Although there is evidence of recycling in LA offices, their effectiveness is often limited by an unstructured implementation and low levels of awareness.

In Renfrewshire there is some limited recycling taking place at the Council headquarters. This includes aluminium cans (collect in dedicated bins on each floor), printer cartridges (collected centrally), paper (collected in paper banks located in the car-park) and computers (which are either refurbished or recycled by external contractors).

Care Home & Social Work Waste

Care Homes and Social Work (CHSW) premises, such as Day Centres, generate approximately 8,500 tpa LA MSW, which is equivalent to approximately 7.5% of total LA MSW arisings in Scotland¹². A breakdown of average composition is provided in Figure 12) and an estimate of quantities by waste fraction is provided in Table 10.

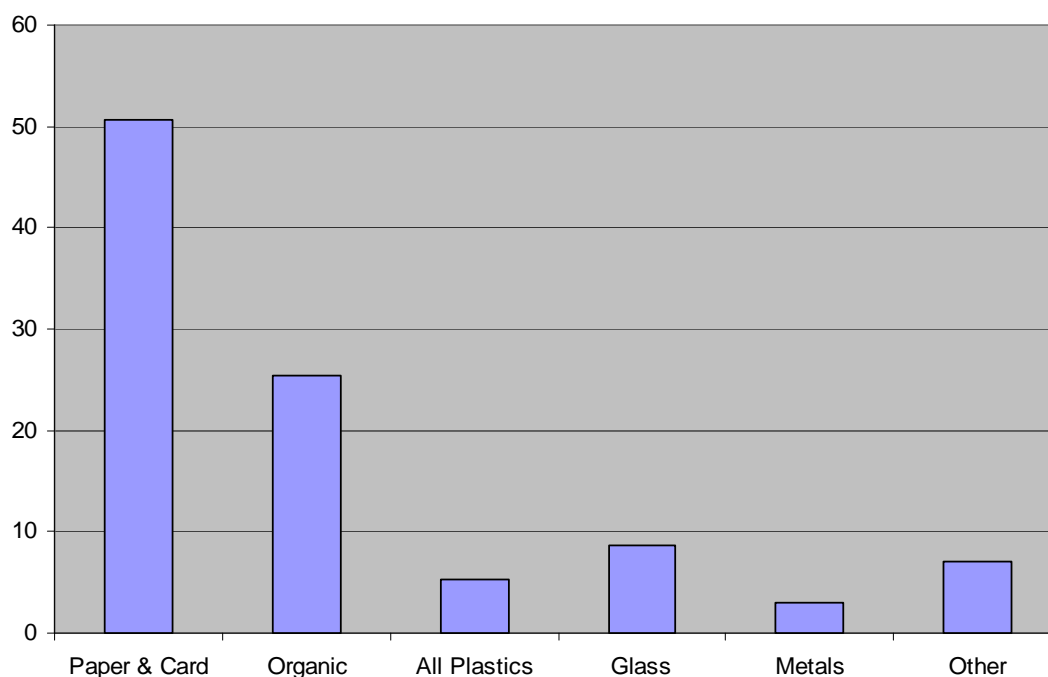


Figure 12 Average composition for LA MSW arising in Care Homes and Social Work (CHSW)

Waste Composition	tpa	%
Paper & Card	4,287	51
Organic	2,101	25
Plastics	420	5
Glass	756	9
Metal	252	3
Other	588	7
Total	8,405	102

**Table 10 Estimated composition breakdown of CHSW waste in Scotland
(NB Due to rounding errors, percentages do not add up to 100%)**

Generally, waste from these premises is similar in composition to domestic waste, however, where premises are predominantly used by elderly or special needs individuals, there tends to be a higher proportion of disposable items, such as paper towels and plastic utensils.

As with schools and offices, the paper and cardboard fraction is the largest, accounting for an average 50%. Most paper is generated by office activities, reading

¹² Data pooled from 10 local authorities: N. Ayrshire, Moray, Midlothian, Inverclyde, Highland, Glasgow, E. Renfrewshire, E. Dunbartonshire, Dumfries & Galloway, and Argyll & Bute.

material and activities organised for the centres' residents and users. Packaging for food supplies, cleaning products, disposable plastic items and care products is the main source of cardboard

Organic waste, mainly as food waste is the second biggest component within waste arising in these premises, accounting for an average 25%. The main source of food waste in care homes and centres are kitchens. Some of these premises also generate small amounts of garden waste.

Together these materials account for nearly 75% of the waste arising in care homes.

Overall LA MSW Arisings

The average waste composition for LA MSW arisings is summarised by LA premise in Table 11 and identifies paper and card as the most prevalent waste stream, followed by organic waste, plastics and glass. Table 11 also identifies Schools as the LA premises that generate the most waste.

Premise	Arisings (tpa)	Paper & Card	Organic	Other	All Plastics	Metals	Glass
Schools	71,302	51.63	18.64	16.03	7.8	2.43	1.9
CCL - Public Halls	15,583	14.7	12.4	2.9	4.4	5.1	59
CCL – Com. Centres		50	7.2	4.4	20.5	6.2	11.1
CCL - Leisure Centres		54.9	10	5.6	17.1	6.3	6.1
CCL - Libraries & Museums		69.68	4.72	7.58	7.82	1.78	2.12
Offices	12,668	74	7.71	4.92	7.76	2.53	0.94
CHSW	8,408	52	26	7	5	3	9
Other	10,426	N/A	N/A	N/A	N/A	N/A	N/A

Table 11 LA MSW average arising (tonnes) and composition (%) by premise

Opportunities for Minimising LA MSW

LA MSW arisings are an important component of the total MSW (between 2.69% and 4.22%) and because of the nature of the waste stream and premises where it arises, waste minimisation and recycling initiatives for LA MSW can potentially make a significant contribution to reducing national waste growth and achieve recycling targets.

The LA Waste Audit Prevention Programme (LA WAPP) provided LAs with an opportunity to evaluate their arisings and prepare Action Plans to minimise arisings and increase recycling of this waste stream.

The LA MSW reviews identified existing initiatives and the Action Plans detailed additional initiatives to further enhance the minimisation and recycling of LA MSW.

However, due to timescales, no data is available detailing the impact the programmes had on LA MSW arisings and it is likely that any reductions in arisings will have arisen from targeting quick wins (e.g. recycling) rather than more fundamental changes (e.g. minimisation). Thus it is believed that there remains much potential yet to be realised from minimising and recycling LA MSW.

Realising this potential is likely to require central leadership, coordination and resources to foster change and help overcome departmental, operational and behavioural barriers. However, it is important to note, that the lack of central coordination and leadership is not the only barrier limiting the implementation of effective minimisation or recycling initiatives: the availability of suitable facilities is also likely to influence available options and therefore play an important role.

This section highlights the benefit of having central/authority-wide coordination of LA MSW minimisation and recycling initiatives, and follows with a discussion of opportunities potentially available for individual waste streams.

Central Coordination

Support for waste minimisation and recycling was evident in most LA MSW reviews, but much potential remained unrealised due to the lack of coordination between various stakeholders. An (extreme) example was reported for one LA premise where office staff used bins provided to segregate paper for recycling only to see it emptied and mixed with residual waste by cleaners for disposal in landfill.

Although examples of this degree of disjointed approach are few and far between, there were more frequent instances where more could be achieved if initiatives were coordinated to overcome departmental, site or operational barriers.

Central coordination could also be used to harness goodwill by ensuring that individuals' efforts were not wasted (as in the example above), making initiatives easy to use (for all stakeholders) and where possible linking up with other recycling initiatives (e.g. those available for domestic waste).

Overcoming these barriers and realising the resulting benefit is likely to require a formal commitment, perhaps formulated through existing environmental policies,

and an independent, dedicated resource (reporting to the Chief Executive) to research, implement and coordinate appropriate initiatives.

A formal commitment would provide direction and leadership in the implementation of waste minimisation and recycling initiatives by setting specific department/waste stream reduction targets. Having a formal commitment would also help harness the potential contribution from departments not directly linked with the production of waste: e.g. procurement could specify products with improved environmental credentials (such ones that could be re-used, recycled or delivered with less packaging), whilst IT could promote digital storage of data, network double-sided printers and through training encourage the use of less paper.

The dedicated resource, through its independence, could support the implementation of initiatives by facilitating cross-departmental cooperation, overcoming barriers, providing research and advice on initiatives, options for individual waste streams and reporting performance. Having a dedicated resource would also create and sustain momentum to sustain initiatives.

An example of a centrally coordinated, cross departmental LA MSW minimisation initiative was provided by the Action Plan for Argyll and Bute Council. An outline “integrated” waste minimisation strategy is provided as Appendix 2.

The LA MSW review for Argyll and Bute revealed that copier/printer paper constituted approximately 45% of total waste arisings in a particular office and that almost all (99%) was printed on one side only. The review also revealed that there were a proportionally large number of printers (almost one for every two staff, in an office with 100 staff) of a variety of makes and models. Both printers and photocopiers were identified as having limited double sided printing capability.

Engaging the IT and procurement departments, the LA MSW Auditor, encouraged them to review printer provision and explore the options for installing a reduced number of networked, combined printers, photocopiers and scanners, with the capability of printing double-sided and producing A5 booklets. The rationale for this approach was that:

- With fewer printers, printing would become less convenient and as individuals would have to get up from their desks to collect printed document, they would reconsider the need to print.
- Installing printers and photocopiers with double-sided and A5 booklet printing facilities, coupled with training, would help reduce the amount of paper printed single-sided.
- Introducing the facility of scanning documents would encourage greater use of electronic storage of data.
- Rationalising printers would reduce waste electronic equipment (obsolete/un-repairable printers) and the range of consumables that would have to be kept in stock (e.g. printer cartridges) and disposed of.

The Argyll and Bute LA review noted that a typical office spends £55 per person per year on paper and if paper consumption could be reduced by 20%, these initiatives, there would be an annual saving of £1,100 on displaced paper purchase and a proportional reduction in waste arisings (and potentially waste management costs).

If this type of waste minimisation and recycling initiative and those listed later are implemented, then a significant amount of the potential for reducing LA MSW could be realised.

Table 12 shows total Scottish LA MSW arisings for the five waste stream groups used in the LA MSW reviews and Action Plans by individual premise. Table 13 details the total tonnage that would have to be minimised or recycled under three example scenarios (25%, 50% and 70%).

Premise	Arisings	Paper & Card	Organic	Other	All Plastics	Metals	Glass
Schools	71,302	36,813	13,291	11,430	5,562	1,733	1,355
CCL (median) ¹³	15,583	8,555	1,122	873	2,665	966	951
Offices	12,668	9,374	977	623	983	321	119
CHSW	8,408	4,285	2,142	577	412	247	742
Other	10,426	N/A	N/A	N/A	N/A	N/A	N/A
Total	118,387	59,027	17,532	13,502	9,621	3,266	3,166

Table 12 Estimate of waste arisings from individual premise (in tonnes)

Premise	Arisings	25% Reduction	50% Reduction	75% Reduction
Schools	71,302	17,826	35,651	53,477
CCL	15,583	3,896	7,792	11,687
Offices	12,668	3,167	6,334	9,501
CHSW	8,408	2,102	4,204	6,306
Other	10,426	N/A	N/A	N/A
Total	118,387	26,990	53,981	80,971

Table 13 Amount (in tonnes) that would need to be diverted to achieve the three reduction scenarios

Although actual targets would have to set by individual Councils, Table 12 and Table 13 show that overall, significant reductions can be achieved by focusing initiatives on the paper and card and organic waste streams. Figure 13 shows indicative savings (in avoided Landfill Tax) that could materialise if these reduction scenarios were achieved throughout Scotland. The important point to note here is the impact the Landfill Tax escalator¹⁴ has on the level of savings: e.g. in 2005-06, when the waste audit programme was introduced, a 25% reduction in LA MSW arisings would save Scottish Councils approximately £486,000 in avoided Landfill Tax payments, whilst a similar reduction from current levels would save £1.3 million in 2010-11.

¹³ The estimate for CCL is based on median of three waste stream compositions analysis (as the fourth, for Public Halls, was excluded because it was significantly different from the other three).

¹⁴ The escalator increases Landfill Tax by £8/tonne/MSW landfilled/year, so that the 2007-08 rate will increase from £24/tonne to £48/tonne by 2010-11. Further increases beyond 2010-11 anticipated (Budget 2008, HM Treasury).

Although further savings are likely to be available, e.g. through avoided procurement, waste handling and treatment costs, these will be specific to individual premises and Councils.

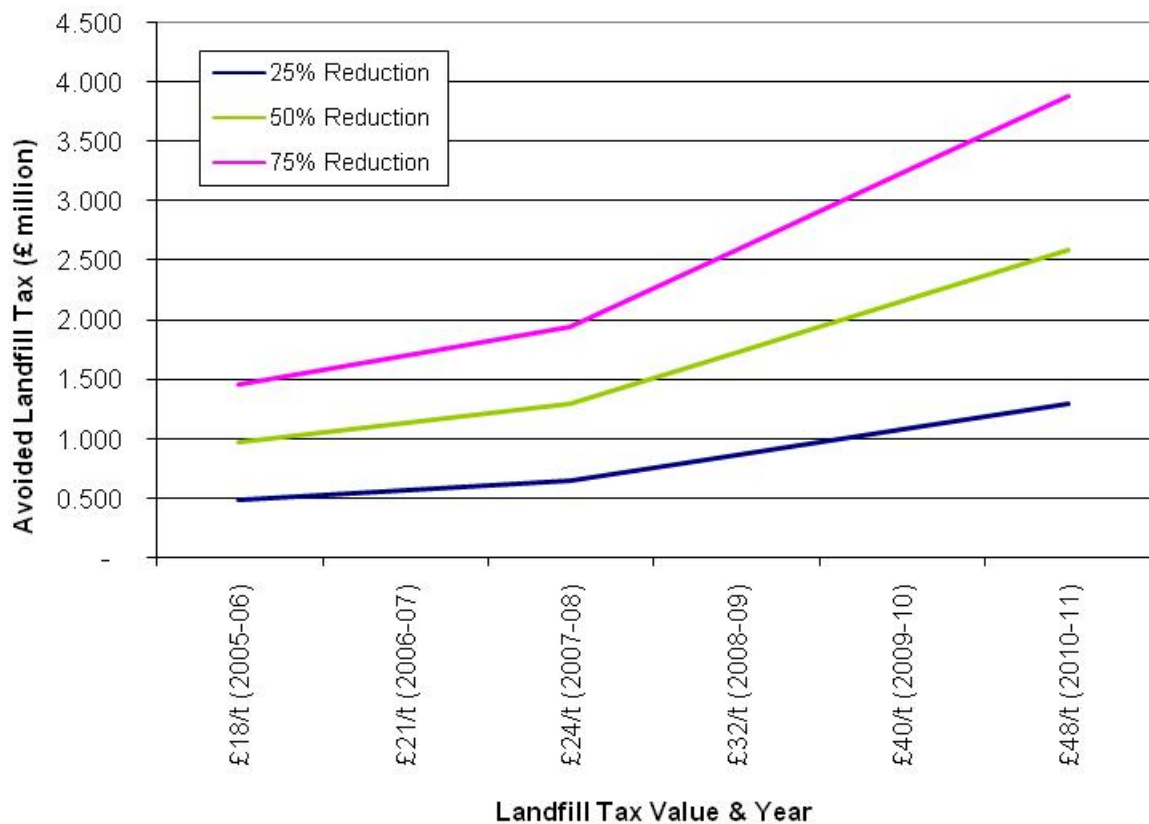


Figure 13 – Scottish estimate of saving from avoided Landfill Tax under the three LA MSW reduction scenarios.

The LA Waste Audit Prevention Programme (LA WAPP) provided initial support for Scottish LA to evaluate their waste arisings and identify waste minimisation and recycling opportunities for individual waste streams. Most Action Plans identified specific initiatives and explored a range of actions which could be implemented during the timescales of the LA WAPP. This overarching report potentially highlights a range of other initiatives, which require more time and coordination to implement, but which could deliver additional benefit (in terms of waste reductions and savings) to Scottish LAs.

Funding for this type of initiative could be provided from savings arising from more efficient resource use, reduced procurement expenditure and in disposal costs.

Paper & Card

Paper and card are the most prevalent fraction in waste generated by Scottish Councils (accounting for an average 52% of total LA MSW: see Figure 2) and one offering the greatest reduction potential as it can easily be minimised, recycled, composted or anaerobically digested. Targeting this waste stream is likely to have the biggest impact on the amount of LA MSW sent to landfill.

The most effective approach, however, is waste minimisation, as it eliminates the waste and the need to manage it.

One example for reducing paper, particularly copier/printer paper was highlighted earlier in the example for Argyll and Bute.

Another option that was featured frequently in various LA MSW reviews and Action Plans was the replacement of paper towels with hand driers. In schools paper towels account for between 30-40% of paper waste (c.17% of total LA MSW), which is equivalent to nearly 13,000 tonnes of waste. However, such a waste minimisation initiative would need to be evaluated on economical and environmental merits, by complementing life-cycle assessments with cost-benefit analysis.

Recycling is an alternative for diverting paper away from disposal in landfill, but requires the introduction of a collection infrastructure and collaboration from both waste producers to segregate paper and cleansing staff to empty collection containers. Although in theory the majority of paper could be recycled, in practice this is generally limited to that of higher value (e.g. copier/printer paper) or of a similar quality to that collected from residents (e.g. through recycling collection services).

Integrating LA premise paper recycling initiatives with those available to householders could be an effective and easy way of tapping into this waste stream, as the infrastructure may already be in place (e.g. collection fleet) and are likely to be familiar with how to use the system (because they use it in their own homes).

Although the LA MSW reviews identified several examples of paper recycling initiatives they also noted that much paper was not being recycled and that additional resources were required to improve these systems (e.g. to raise awareness and participation or to simplify their use).

Cardboard was one such “paper” product not collected by existing systems in most authorities and one which could be targeted for recycling, particularly as it is a very common packaging material. Virtually all LA premises will generate cardboard waste and in areas where LA premises are relatively close to each other (e.g. in cities and towns) there is potential for introducing a dedicated collection. Because of its bulky nature, removing cardboard from the general waste stream is likely to reduce individual premises’ container requirements (and therefore immediately offer a saving).

Inevitably, however, there will be a fraction of paper products that are not suitable for recycling (e.g. envelopes, coloured/waxed paper, paper towels etc.) and, provided that a collection infrastructure is in place, composting or anaerobic digestion may offer a potential solution for these items. If these treatment options are available they may have the facility to simplify collection arrangements and target a greater proportion of paper waste.

Organic Waste

Organic waste is the second most prevalent fraction in waste generated by Scottish LA (accounting for an average 10% of total LA MSW and nearly 20% of school waste

arising (Table 11) and arises primarily from food preparation and consumption activities.

Unlike paper and card, current, opportunities for minimising this waste stream are limited and its segregation is not widespread, primarily because in Scotland suitable treatment capacity is limited (i.e. there are very few composting or anaerobic digestion sites accepting this waste stream).

As this changes, the scope for diverting this waste stream away from landfill increases. In particular, we note that several LAs are piloting domestic kitchen waste collections and believe there could be potential for including organic waste from LA premises. If this level of integration is not possible, then the amount of organic waste arising in LA premises may justify a dedicated collection.

Notwithstanding this, it is theoretically possible to treat this waste stream at source, and a few LA MSW reviews identified some LA premises (e.g. schools) with small composting units, it is unlikely however that this would be practical or cost effective on a larger scale.

Most organic waste is associated with food preparation and consumption and is often disposed with single-use crockery, cutlery and packaging. Putting in place a segregated collection for organic waste represents an opportunity to consider minimisation opportunities for other streams (e.g. replacing single-use crockery and cutlery with crockery and cutlery that can either be re-used or composted).

Ultimately, however, this potential is likely to remain unrealised until adequate treatment infrastructure becomes locally available (perhaps to treat material collected from households or commercial and industrial premises).

Plastics

Plastics are the next most readily identifiable waste stream arising in LA premises and account for approximately 8% of total LA MSW arisings. 'Plastics' is the popular name given to a wide family of strong, flexible and lightweight polymers used in a virtually limitless range of applications. Within LA premises, plastics arise as both packaging (e.g. film, beverages or cleansing products) and single-use products (e.g. cutlery and crockery).

The LA MSW reviews and Action Plans identified opportunities for both minimising and recycling plastic arisings. However, because plastic composition varies with specific applications, exploring these opportunities is not as straightforward as for the preceding materials and opportunities are more limited. Nonetheless, the following highlight some areas with potential for minimising and recycling plastic arising in LA MSW.

Immediate reductions in LA MSW could be achieved by reviewing the use of single use products, such as cups, crockery and cutlery and replacing them with reusable alternatives (e.g. glass, porcelain or metal) or ones that could be composted (e.g. waxed paper or corn-starch). Replacing single use containers for cleansing and swimming pool maintenance products with returnable/refillable ones could be explored with suppliers, as in certain premises (e.g. leisure and community centres) plastics account for nearly 20% of all waste arisings.

Other minimisation opportunities will be available for plastics, but these will have to be assessed on a case by case basis and with due regard to any environmental benefits of using plastic products (e.g. in product protection or transportation).

Where LAs offer residents the opportunity to recycle plastics through kerbside collections, recycling points or recycling centres then provision could be made for collecting similar materials from LA premises. This not only potentially offers a more cost effective way of collecting these materials for recycling (because funding for the main infrastructure element is already in place), but also capitalises on any existing awareness and information campaigns.

Glass

Waste glass accounts for about 6% of average LA MSW arisings, and ranks as the smallest waste fraction.

No minimisation opportunities were identified for waste glass arising from LA premises.

As the most common source of waste glass within LA MSW was identified as packaging (i.e. bottle and jars) the easiest way of diverting this waste stream away from disposal in landfill is to integrate premises generating it (e.g. Public Halls) into existing collection arrangements (e.g. domestic kerbside collections or recycling centres) or commercial waste glass collections.

Unfortunately, diverting waste glass from disposal in landfill is not this straight forward, and several LA MSW reviews noted difficulties in getting LA premise users to participate in glass segregation and premises with limited storage capacity as the main barriers.

Overcoming these barriers is likely to require better provision of information, awareness raising and simplification of collection arrangements.

Metals

Metal within the waste streams reviewed accounts for approximately 3% of total LA MSW and arises primarily as beverage and food packaging.

The suggestions for, and challenges of, managing this waste stream are virtually identical to those listed for glass.

Other Waste Streams

Although the above five waste stream categories accounted for the vast majority of LA MSW arisings, various LA MSW reviews and Action Plans identified other materials that, either due to their potential toxicity or size, may require special arrangements. These included IT equipment and consumables, fluorescent light tubes, furniture and cooking oils.

IT Equipment & Consumables

From several Audit Reports and Action Plans it was apparent that arrangements for handling redundant (waste) IT equipment were not consistent within or between LAs.

Although on a weight-basis IT equipment appears to account for a very small proportion of LA MSW, due to the potential toxicity of constituent parts, legislation¹⁵ is in place requiring that IT equipment (e.g. computers, screen and printers) is segregated and sent to specialists for recycling. To ensure regulatory compliance, it is imperative that LAs put in place appropriate systems for ensuring that these items are not sent to landfill.

For consumables, which are not covered by producer responsibility legislation, many suppliers and independent organisations offer both re-fill and recycling services. LA IT departments, in conjunction with central stores, would be the LA departments best placed to implement this type of initiative.

Fluorescent Light Tubes

The Audit Reports revealed that fluorescent light tubes, despite being classified as hazardous waste, did not benefit from consistent arrangements within or between departments and LAs.

Disposing of spent fluorescent light tubes mixed with general waste can result in the whole consignment/load being re-classified as hazardous and therefore requiring disposal at an appropriately licensed facility.

In addition to regulatory compliance, the higher costs associated with disposing of large quantities of waste (e.g. general waste “contaminated” by fluorescent light tubes) at hazardous waste facilities should be a sufficient incentive for Councils to put in place a segregated collection from their premises for spent fluorescent light tubes.

Implementing such a system could be allocated to the department responsible for facilities/building maintenance.

Redundant Office & School Furniture

Office furniture was another component of the waste stream that the Audit Reports identified as not benefiting from consistent arrangements within or between departments and LAs. In some LAs redundant furniture was re-used or recycled, whilst in others it was simply landfilled.

Although there is no specific requirement to divert redundant furniture away from landfill it potentially represents a missed opportunity, as:

- Redundant furniture can easily be re-used, either directly by the LA or in conjunction with furniture re-use groups¹⁶,

¹⁵ The Waste Electrical and Electronic Equipment Regulations 2006

¹⁶ Community Recycling Network for Scotland furniture re-use website:
<http://www.morethanfurniture.org.uk>

- Can easily be dismantled and recycled.

Because of its volume, diverting redundant furniture away from landfill, can also enable LA premises to make better use of existing waste collection arrangements (e.g. containers may not need to be emptied as often or special collections may not be required).

As furniture use (and replacement) tends to be department specific, LA could set up a furniture exchange bulletin prior to having any material collected by external partners (e.g. furniture re-use groups). Such an initiative would enable LAs to divert a proportion of furniture away from landfill and benefit from lower expenditure purchasing new furniture.

Used Cooking Oils

Consistent arrangements for collecting used cooking oils (UCO) were not reported in all Audit Reports but it has long been good practice for large users to have UCO collected by specialist contractors.

Typically UCO are collected by cooking oil suppliers, on a take-back basis, or by dedicated specialists for use as an ingredient in animal feed and, post 2004 as a feedstock in the manufacture of bio-diesel.

An example of an organisation converting UCO into bio-diesel is the Rural Development Forum¹⁷, who collects it from school kitchens and other premises in South Lanarkshire and uses the bio-diesel in their fleet of buses. Argent Energy¹⁸, in North Lanarkshire, are on the other end of the spectrum, operating the UK's first large scale bio-diesel plant, and processing UCO collected from an extensive network of suppliers.

Although it is likely that LA catering facilities, as potentially large producers of UCO, already benefit from a dedicated collection, it is worth noting that anything else could potentially result in a breach of regulatory obligations.

Overall Recommendations

The review of LA MSW Audit Reports and Action Plans noted that although in some LA premises arrangements are in place to minimise and recycle arisings, much potential remains unrealised.

To realise this potential, LAs will need to make resources available to centrally coordinate the implementation of initiatives so that cross-departmental barriers are overcome (e.g. unclear definition of roles and responsibilities or resource allocation) and stakeholders focused on a common goal.

Central coordination will also help identify and prioritise initiatives to ensure that resources are targeted at where they will have the greatest impact (e.g. in terms of minimisation potential or recycling and composting).

¹⁷ <http://www.ruraldevelopmenttrust.co.uk/>

¹⁸ <http://www.argentenergy.com/>

Strategies for reducing arisings will take time to implement and become embedded. It is therefore likely that the quickest impacts will be observed when local authority premises take part in existing recycling schemes and target the most prevalent materials.

In general terms, schools were identified as the biggest waste producers (c.71,302 tpa, equivalent to 64% of total LA MSW arisings) and paper and card (c.59,027 tpa, equivalent to 52%), followed by organic waste (c.17,532 tpa, equivalent to 10%), as the most prevalent LA MSW constituents. Targeting these premises and waste streams is recommended.

Extending existing kerbside recycling services to LA premises is a quick, comparatively inexpensive and simple way of capturing the smaller constituents of LA MSW (e.g. plastics, glass and metals). Another benefit of this approach is that it builds/complement increased awareness from domestic recycling initiatives.

Further reductions will be evident once new procurement policies (e.g. ones that encourage reduced packaging and product take back schemes) and working practices take effect and as new processes become available (e.g. in-vessel composting facilities suitable for waste paper and food waste).

Initiatives of this nature will be required to sustain the momentum originally generated by the waste audit process and Remade Scotland has planned a range of initiatives to support LAs reduce internal waste arisings.

Future Work

To sustain this momentum and assist Scottish Councils reduce internal waste arisings and reliance on landfill, Remade Scotland is proposing a range of initiatives in close collaboration with other government funded projects, e.g. Envirowise (with whom Remade Scotland have agreed to develop a joint working approach to ensure programme synergy and not duplication).

The level of support will range from generic case studies highlighting opportunities in areas common to all Scottish Councils to specific support and facilitation to promote intra-departmental working. Examples of activities in the support programme include:

- Good practice case studies quantifying the economic benefits of waste minimisation and recycling opportunities for key waste streams.
- Identify and explore department-specific opportunities that show-case the cross-cutting role central departments, such procurement, facilities and IT, play in reducing waste arisings and recycling rates for internal LA waste arisings.
- Individual LA support to highlight cross cutting theme of LA waste arisings, recruit a pathfinder LA to implement a coordinated approach (i.e. one involving all departments) to waste minimisation and recycling.
- Expand and actively promote existing kerbside services to council premises.

Appendix 1 Waste Audit Process

Managed Audit Programme

Remade Scotland managed the waste audit programme for 21 out of 32 Scottish Local Authorities, a role that involved recruiting auditors with appropriate knowledge, skill and experience to implement the programme within each local authority and ensuring that all necessary resources and support were available to the auditors. Remade developed a training programme for the auditors, established standardised methodologies and held regular workshops for the audit staff. Management responsibility extended to ensuring that each auditor was clear about and focussed on the programme's objectives and that opportunity for discussion and advice from the management team and other auditors was available. As part of this, an on-line discussion forum was set up on Remade Scotland's website.

The audit process was broken down into the following key stages:

1. Preparation: this includes ensuring commitment for the project from senior level staff within the local authority, acquiring an understanding of the organisations structure and responsibilities within each area of the local authority. Acquiring knowledge of facilities, contractors and current waste management operations and identifying and agreeing on the objectives of the audit.
2. Recording: obtain records relating to the waste handling within local authority premises.

The waste audit then provides sufficient information to address the next two key stages

3. Evaluation: environmental and economic evaluation of waste reduction options. Identifying problem wastes, areas for improvement and potential barriers.
4. Waste Strategy: devising a waste strategy to address the issues identified in the previous stage.

Auditing Guidelines

ISO 19011 details the core principles for environmental auditing, which were used as guidelines for the current project, which are listed below:

- Ethical conduct
- Fair presentation
- Due professional care
- Independence
- Evidence based approach

Audit Objective

Identifying clear objectives for the audit helps to focus and direct the audit programme. The main objectives for carrying out waste audits of Scottish Local Authority facilities were wide ranging and include:

- Provide baseline data relating to current waste management practices against which future audits could be compared.
- Support the preparation of Waste Action Plans including
 - Highlight areas where recycling rates could be improved
 - Establishing responsibilities and authority for waste minimisation activities.
 - Improve waste awareness and commitment amongst staff.
- Reducing procurement costs.
- Reducing waste arisings and associated disposal and handling costs.
- Ensure statutory obligations are met.
- Establish uniformity across the councils services with respect to procurement, recycling, signage and documentation.

Audit Methodology

This study was limited to solid waste arising under 'direct control' of the Council from main buildings and activities of the local authorities such as offices, education, leisure, libraries etc., and offered LAs the opportunity to learn about the overall arrangements for managing their waste arisings.

Audit data was also used to produce a wider picture of waste management within all Scottish local authority premises.

Data Collection

The type of data collected by the research officers fell into two broad categories.

1. Documentation.
2. Onsite reviews.

Each local authority made available resources and documents such as: the assets registers from which council premises identified, commercial customer lists and waste returns/invoices/waste transfer notes. These resources were reviewed and compared to determine sources of waste.

Typically waste transfer documentation from Cleansing Services, or the equivalent, provided the volume of waste per annum i.e. types and quantity of containers and frequency of collection. The various heads of each department or service provided a contact person within their service to provide relevant data. The contacts used their knowledge to identify the types of waste generated within their work environment. From a visual inspection of current waste, an estimated percentage breakdown of the total solid waste generated at various sample locations was produced.

Onsite visits and other techniques were used to estimate waste stream composition and levels of waste generation from different premises. These techniques included:

- Walk through audits
- Visual waste profiling
- Onsite visits including interviews and waste surveys
- Appreciation of procurement

From the walk through visits, an appreciation of the activities taking place in a premise was acquired. These visits provided valuable opportunities to discuss waste generation with personnel, e.g. office managers or cleaners, and to assess staff interest and knowledge of waste related issues. The knowledge gained from walk through visits coupled with information regarding types and quantities of materials purchased, used and finally discarded by the staff produced an overall picture of waste generation pattern of each type of premise.

Conversion Factors

Available data were usually in the volumes and density factors to convert volumes of different types of waste to weights were provided by Remade Scotland. A number of local authority studies allocated time at the outset to confirm these appropriateness of these conversion. The conversion factors used are listed in the table below.

Material	t/m³
Paper	0.07
Cardboard	0.04
Paper Towels	0.1
Glass	0.3
Steel and Al Cans	0.05
Plastics	0.03
Organic	0.24
Other	0.2

Data Validation

A number of waste analyses were undertaken to ensure that the recorded data was representative of the actual arisings. A typical basic visual waste analysis involved using clear plastic bags for the collection and analysis of the waste produced at selected properties. In some areas these analyses included a two-week trial to assess the accuracy of the current density conversion factor. The trial involved a separate collection of commercial waste and measured the volume of wheeled bins collected against the tonnage to ascertain the density of non-compacted mixed waste. It is recommended that further work be undertaken in this area to enable a precise conversion factor to be produced.

Data Limitations

Given the time and resource restrictions in this programme, much of the data presented in this report are based on estimates and extrapolations i.e. in many

cases, data from sample locations from each premise type and service function were estimated for example, from visual analysis and the percentage breakdown then applied across all similar premises and functions. This of course only estimates the actual waste arising for that building type.

Conversion factors were used by most of the local authorities taking part to convert volumes to tonnages. In some areas, only partially complete data was available. Totals were made by extrapolating these factors, introducing limitations to their accuracy.

Appendix 2 Outline Waste Minimisation Strategy

Introduction

The initial phase of the programme provided valuable information about both waste arisings and current internal waste management practices, enabling LAs to identify and prioritize initiatives and implement them through detailed Waste Prevention Action Plans. Although these initial stages concentrated on 'quick wins', they also identified medium and longer term actions. The data generated by the waste audit now serves as a baseline against which future progress and ultimately success of the WPAP can be gauged.

It is essential that a waste minimisation plan is seen as a 'top-down' initiative, with respect to senior management approval and support. Therefore a number of steps directed specifically at senior management were included (i.e. strategic approach) that encapsulate the intention to reduce waste throughout the entire organisation. These strategic procedures provided the support platform for the implementation of the Action Plans, which were then cascaded down to individual operations and staff (i.e. operational approach).

Although the Action Plans were based on the waste hierarchy, their successful implementation depends on the level of awareness and support from all individuals involved (i.e. stakeholders) to overcome cross-departmental barriers.

Approach to Waste Minimisation

Both the strategic and operational approaches should occur in parallel and target different areas of the organisation. Strategic and operational actions were implemented in the initial months of the Action Plans.

Strategic Steps

These steps were targeted primarily at Councillors and senior management.

- **Development of a local authority Waste Policy**
 - Each local authority should develop a bespoke waste policy stating its intention to make efficient use of resources and reducing waste arisings.
 - These policies should be strategic documents that set out the council's position on how it will manage its waste and indicate to stakeholders that the local authority is committed to more sustainable practices with a primary objective of reducing waste arisings.
 - The policy should reflect top management commitment and be signed by the Chief Executive and the Council Convener.
 - In drafting such a policy, key personnel involved in existing waste management arrangements within the local authority should be consulted.

- The policy should be reviewed on an annual basis or as new environmental legislation is introduced.
- Once in place this policy should be communicated to all employees, the public and all organisations that are part of the local authority supply chain.
- **Senior level support:** If councillors and senior management make clear their support for waste prevention, staff acceptance and enthusiasm for the initiative will be improved. A major factor in the success of any initiative of this nature is clearly visible, top level support and means of communicating this support to all personnel should be devised. For example, in Orkney, a short film 'Orkney Islands Council Waste Management' has been produced that highlights the steps being taken within Orkney to improve waste management. To enable top-level support, regular meetings should be arranged between senior management and representatives of involved parties e.g. a Waste Minimisation Working Group or Waste Team.
- **Production of key procedures:** A number of key procedures are required to provide guidance and direction for staff in their efforts to make more efficient use of resources and reduce waste. A major issue that should be considered in producing these procedures is 'greening' the supply chain.
 - **Greening the supply chain**

The UK government is currently exhorting the public sector to introduce 'green' purchasing and use its purchasing power to further the aims of sustainable development¹⁹. Each local authority should view this as an opportunity to lead by using its procurement budget as a driver for innovation in sustainable design and exert influence over consumption patterns and waste streams. In adopting and pursuing 'green' procurement each local authority should:

 - Identify and promote best practice;
 - Perform supplier appraisal;
 - Include environmental specifications in contract documents; and
 - Evaluate environmental specifications in tender documents.

¹⁹ The European Commission has produced a Handbook on Green Public Procurement. Buying green: how public authorities can help save the environment and taxpayer's money. It explains in clear, non-technical terms how public purchasers, such as schools and local administrations, can take into account the environment when buying goods, services and works. Green purchasing increases demand for green goods, encourages green production and helps environmentally friendly technologies conquer the market. The Handbook gives best-practice examples and provides advice through the steps of a procurement procedure.

Greening the supply chain should be tackled through training, raising awareness and improving communication between staff involved with environmental issues and those responsible for procurement²⁰.

Decisions on products selected could be extended to include the type of material used and minimum recycled content. For example, the plastic for disposable items used in catering facilities is one example highlighted by the report from Glasgow City Council. Switching to products made from more readily recyclable materials would facilitate diversion away from landfill, although ultimately it may be more appropriate to discontinue the use of single use, disposal items.

These principles of “Wise Buying” should be formalized in a policy for all local authority procurement staff.

- **Measuring and monitoring:** “If you don’t measure it....you can’t manage it” is the catch phrase of the Envirowise waste minimisation programme. If a waste minimisation initiative is to succeed, key inputs and outputs must be measured. The monitoring of these measurements will clearly identify whether implemented changes/improvements have been successful or not. Local Authorities must devise a series of Key Performance Indicators (KPI), for each department or site, to track the tangible reduction in waste. Such indicators should be monitored periodically and modified as required. For example, a widely used and recognized ‘benchmark’ for good practise within office based operations is the quantity of paper used by staff, usually expressed as reams of paper used per head of staff. UK government guidance indicates that a best practice small office can use as little as seven reams of paper per person per year²¹. It is recommended that this could be adopted as a ‘corporate’ measure of efficiency and monitored to record progress towards targets agreed with each department/facility.

The following Key Performance Indicators (KPIs) could be modified and extended to suit the nature of operations being carried out at individual sites.

- Changes in total quantities of waste collected/recycled
- Changes in total arisings sent to landfill
- Waste prevention actions implemented (e.g. new leases/hires; refills)
- Actual and projected waste arisings
- Actual and projected growth in waste arisings

The first four indicators above should incorporate monetary values to provide an indication of savings and avoided costs. These KPIs would, collectively, measure effectiveness of waste prevention activities within each area of service, activity or premise. For example, the KPIs are capable of being targeted at corporate local authority level and/or at workplace level,

²⁰ See ‘Taking Stock: the national procurement strategy for local government. www.idea-knowledge.gov.uk

²¹ Envirowise; Green Officiency GG256

including per FTE/capita output measures. The KPIs are critical in providing benchmarks for use in self-assessment monitoring programmes over timescales. KPIs also provide a benchmark against other authorities, which assists in the identification and implementation of “good practice” initiatives.

- **Communication:** The intention to reduce waste and improve waste management should be communicated to all local authority personnel. The reasons behind the initiative should also be highlighted. Regular communication to staff of progress towards objectives/targets is vital if staff enthusiasm is to be maintained. Success stories should be recognised and widely reported. Success in reducing waste within local authority operations should also be communicated to the public. To sustain momentum, events such as a ‘Waste Amnesty Day’ or a council-wide ‘Waste Awareness Week’ should also be considered.
- **Management review of progress:** On a regular basis senior management should review progress of the waste minimisation initiative. This should involve consideration of key documents such as the waste policy and central procedures to ensure that they are still appropriate. Progress/success in achieving objectives and meeting targets should be considered and new objectives and targets set.
- **Potential savings:** It is well documented²² that the average cost of waste is 4% of company turnover, when all wastes are considered (e.g. waste, water, energy, time, resource use and labour). Waste minimisation initiatives can contribute a further 1% savings.

Operational Steps

Operational steps are targeted at existing services with responsibility for waste management, recycling officers and other personnel such as ‘Waste Champions’ involved in promoting and implementing waste minimisation strategies.

Identify target wastes: During the waste audit, examples of existing good practice were noted and ideas and suggestions for further waste reduction were presented by staff and discussed. In general, there is a complex mix of factors influencing which wastes can be tackled. The logistics of waste collection and segregation facilities along with ease of implementation, scale of efficiency/saving, cost of implementation etc must all be considered. Discussions between groups responsible for implementing waste minimisation should identify common wastes which should provide the initial focus for the waste reduction strategy. The target wastes will vary between departments and reflect the nature of the service. For example, glass may be a target waste for community centres but not schools.

Identifying reprocessing facilities: Paper, glass and cardboard recycling is well established in most areas of the country but there are many other materials such as plastics, metal cans and TetraPak that can be recycled but facilities are not always available locally or for an economical price. A key part of this operation will be to identify appropriate outlets for any materials collected for recycling..

²² <http://www.envirowise.gov.uk/>

Working with manufacturers to improve recovery: Discussions with the manufacturers of items that ultimately join the waste stream could prove valuable. Many manufacturers are keen to address the issue of sustainability of their products and sometimes actively seek co-operation from local authorities. Recycling Officers or Waste Champions should be prepared to discuss ideas with manufacturers who embrace waste minimisation into product design.

Objectives and SMART Targets: Once objectives have been agreed, targets and time scales for improvement should be set for each department/facility and a measurement and monitoring process implemented to ensure that progress towards these targets can be assessed. All targets should be 'SMART' i.e. – Specific, Measurable, Achievable, Realistic, Time-bound targets

Implementation of monitoring and measurement programme: Most internal waste audits carried out by the local authorities taking part in this project indicated that currently, measurement of waste arisings is at best sporadic. Monitoring waste arisings is essential to the success of any waster reduction programme. With the support of Waste Champions all departments should establish a series of Operational Performance Indicators which can be monitored throughout the year. Typical indicators that could be used to measure a reduction of waste are:

No of black plastic sacks;

No of skips or bins emptied; and

Weight by waste type.

Typical indicators that could be used to measure an increase in recycling of waste are:

- Weight of waste collected;
- Weight of waste recycled; and
- Amount (paper, cardboard, plastic etc) sent for recycling.

Staff should be kept informed of performance of their department or premise and indicators should be reviewed periodically and modified as required. A simple but well designed 'Waste Monitoring Sheet' should enable the collection and dissemination of waste data by Waste Champions. Clear ownership and responsibility for these waste reduction targets and the data generated will help focus efforts which in turn will be beneficial to the project.

Waste information: To ensure the Waste Policy is consistently supported and to encourage employees to engage with the waste minimisation plan, each local authority should introduce guidance for all personnel. Guidance should be provided in the form of a number of simple procedures that detail which materials can be reused and/or recycled. The procedures should detail what should be done with the materials, what facilities are in place to deal with them and wherever possible information on the final destinations of their waste should be made clear to all personnel. Allied to this, information on recycle/re-use/disposal routes should be provided and a clear explanation of why the local authority is endeavouring to reduce waste and to improve the management of its waste streams. This typically should include best environmental practice in dealing with:

- Waste paper
- Shredded paper
- Cardboard
- Catalogues/magazines
- Batteries
- Printer/photocopier toner cartridges
- Redundant furniture
- Redundant electronic equipment (PCs, laptops, copiers, calculators, video recorders etc)
- Aluminium drinks cans
- Steel cans
- Glass
- Fluorescent lighting tubes
- Food waste.

Liaising to improve logistics of waste collection: Many of the 'walk throughs' and discussions carried out as part of the waste audit highlighted the willingness of the participants to segregate and collect waste but often logistical difficulties were encountered. For example, collecting waste for recycling from a large number of collection points is often complicated and expensive. Adopting procedures to take recyclate from smaller premises to a central point could provide a simple, more economical solution. This and other logistical problems identified by staff should be addressed, and discussed via the forum offered by the Waste Champions meetings.

Setting Time Scales for Waste Minimisation Plans

There are a number of significant opportunities to realize both short-term “quick wins” and also longer-term initiatives. The “quick wins” in terms of waste reduction, recovery and recycling are possible in the areas detailed below.

Quick Wins

“Quick wins” are essentially quick fixes to reduce waste that also grant the project with essential momentum and attention. The most immediate gains in diverting waste from landfill would be to make more efficient use of schemes that are already in place such as recycling schemes. Many of these are organised by local authorities for domestic collections and this could be extended to council premises such as schools which fall into this category. Other commercial schemes available locally could also make a significant contribution to waste minimisation.

Reduce and Re-use: Paper is a major waste in all local authority sectors, particularly in office and schools. Some of this waste is in part due to misuse e.g. paper towel waste in schools or due to lack of thought or knowledge but a number of simple measures could be set in place quickly and easily to reduce this waste. For example

- Discouraging staff from printing emails, memos and other documents unless essential.
- Use emailing and intranet for memos where possible.
- Re-use envelopes for internal mail.
- Printer and Copier workshops to ensure all staff know how to operate printers and photocopiers. This will reduce the likelihood of paper being wasted in error.
- Set all copiers and printers with double-sided capacity to print double sided and ensure that all employees are aware of this.
- Encourage scrap paper collection for notes and rough drafts.
- Introduce limits on paper usage in accordance with UK government guidance indicates that a best practice small office can use as little as seven reams of paper per person per year²³.
- Reduce junk mail by ensuring names and work addresses are removed from marketing databases. There are a number of companies that offer this service.
- Improve security of skips and bins to eliminate fly-tipping.

²³ Envirowise; Green Efficiency GG256

Recycle: When waste cannot be avoided or re-used, it should, where possible be recycled.

- Office paper recycling schemes: Introduce paper recycling if not currently available. There are many examples of recycling schemes in place already but these should be examined and modified to improve efficiency. For example, there are incidences of poor communication between staff where paper for recycling that is segregated by office staff is gathered up with residual waste by cleaning and janitorial staff. Similarly if residual waste bins are too readily available i.e. beside every desk, it is likely that that is where paper will be placed instead of in the paper-recycling facility.
- Recovering print/copier cartridges. There are several small schemes in place already but these should be extended and better co-ordinated. Many schemes are operated by charities but take-back schemes with suppliers could also be negotiated
- Office metal/plastic container recycling
- Collection of targeted dry recycle from Office, Leisure, Community and Depot premises

Medium and Longer-Term Initiatives

- **Procurement:** Local Authority procurement services should negotiate with suppliers to introduce take-back schemes for packaging, printer cartridges and 'end of life' items. Where possible disposable items that are made of recyclable material or from recycled materials should be purchased. If buying in bulk, local authorities could also specify reduced packaging and packaging materials.
- Audit printing and copying facilities in offices to ensure that premises are not over-supplied.
- Collection, bulking and recycling of clean card/packaging waste.
- Rationalised use of skip hire facilities
- Establishment of kitchen waste organic collection services from schools kitchens and staff/public catering facilities
- Establishment of economic outlets for ICT and all forms of WEEE
- Re-use furniture and introduce an e-bulletin board to advertise availability of items to other departments. This would increase turnover of items and reduce storage problems. Alternatively negotiate with local charities and voluntary organisation that may re-use or sell items.
- Establish agreed responsibilities for management/collection of segregated recycle (Building Cleaning/Trade Unions)

Evaluation

The initial waste audit provided baseline data against which the effectiveness of the Waste Minimisation Plan can be measured. This will require regular re-measurement of waste arisings followed by an evaluation stage to quantify the levels of improvement achieved. Not only will accurate and timely data identify the nature and scale of change in waste arisings but it will also provide an understanding of whether waste minimisation efforts within the local authority have been well resourced and managed and understood.

Knowledge gained from the evaluation exercise will be invaluable for setting future targets and modifying existing waste minimisation strategies.