DRAFT

WASTE MANAGEMENT STRATEGY

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1.0 INTRODUCTION

1.1 Calderdale Metropolitan Borough Council -Profile

The Metropolitan Borough of Calderdale is the smallest unitary authority in the West Yorkshire and Lancashire conurbation, being surrounded by the bigger authorities of Kirklees, Bradford, Leeds, Wakefield, Oldham, and Burnley. The administrative centre for local government purposes is based on Halifax, with other important settlements situated along the Calder Valley starting with Brighouse towards the eastern boundary and then working westerly the towns of Elland, Sowerby Bridge Mytholmroyd, Hebden Bridge and Todmorden on the extreme westerly border of the Authority adjacent to the Lancashire border . The total area of Calderdale is 140 square miles (36,346 hectares), over 80% of this area is rural with the rest being semi rural or urban in character. Most of the land area is concentrated in the Calder Valley, which forms a geographical "backbone" to the Authority. The valley is narrow in places served by one "A" class road the A646 that becomes congested at times. Any road works or civil engineering works along this main road route can cause service related problems for the Authority.

The population living in rural areas is approximately 45,000 which represents just 24% of the Borough total. The populations of the towns making up the Borough are Brighouse 36,300, Elland 19,700, Halifax 82,100, Hebden Bridge 13,100, Sowerby Bridge 23,300 and Todmorden 14,900, giving a total population of 192,400[1]. The age distribution of the population is shown in the table below.

Table A - Population Distribution by Age – Calderdale Metropolitan Borough Council[2]

Age Group	2003
All ages	193,200
0-15	40,400
16-24	19,300
25-44	54,500
45-64	48,900
65+	30,200
75+	14,800

The population of Yorkshire and the Humber region is expected to grow by 0.6% from 2001 to 2006, and by about 0.8% from 2001 to 2008. From 2001 to 2008 the population of England is projected to rise by 2.4%. Thus population growth in the north will most probably lag behind the country as a whole. Calderdale's overall population is predicted to be fairly stable during the next 5 years although household formation is likely to grow particularly over the next few years as old mills and "brown-field" sites are developed for housing to accommodate the existing population and commuters travelling to Manchester and Leeds to work.

[1] Based on 2001 Census rounded to nearest 100
[2] 2003 Mid –year Estimates – Office of National Statistics © Crown Copyright

The ethnic population was 7% of the total in 2001, below the national average of 9%. The age profile is young with I in 3 (compared to 1 in 5 of the white population) being under 16 years old. The ethnic minority residents are mainly concentrated in Central Halifax where they are just over 50% of the resident population. There are small but significant minority ethnic populations in Elland and Todmorden once high profile textile manufacturing towns.

Calderdale in terms of scale is the Authority with the 6th largest area and the 5th lowest population.

Rural type tourist areas are mainly to the west including the town of Hebden Bridge and the Hardcastle Crags area owned by the National Trust. Other tourist attractions include The Piece Hall (1769) an Italianate structure, Shibden Hall an Elizabethan manor house and Eureka, a children's museum. Calderdale has over 4,000 listed buildings.

The socio economic make up in the Borough is mixed with varying amounts of deprivation throughout the Borough. The table[3] below compares deprivation in Calderdale with the adjoining authorities. The lower the index number the greater the measure of deprivation indicated.

Table B - Ranking of Calderdale and Neighbouring local authority areas

District	**Scale Measures**		**Measures of Multiple Deprivation**			
	Employ-ment	Income	Average Score	Average Rank	Extent	Concentration
Bradford	6	5	30	51	31	11
Burnley	112*	122*	37	46	40	21
Calderdale	**68**	**70**	**86**	**87**	**83**	**65**
Kirklees	16	21	77	81	73	68
Leeds	4	4	68	91	64	24
Oldham	44	48	43	56	36	26
Wakefield	11	29	54	53	56	61

This shows that Calderdale in terms of employment and income is better placed than those Authorities on its borders.

Multiple deprivation is examined in two ways (a) throughout the Authority as a whole the overall figures being given in average score and average rank and (b) in 157 out of 354 authorities where the deprivation is the most severe, and covers 10% of an authority's population. Again Calderdale has the least multiple deprivations in 2 of the 4 measures of multiple deprivations locally.

Internally Calderdale varies considerably with extremes of affluence and poverty. Areas with the highest levels of multiple deprivations are within the wards of Park, Ovenden, Illingworth, Mixenden and Town. Pockets of deprivation are also found in other wards. For those affected by deprivation, particularly outside Halifax, difficulties

[3] Office of Deputy Prime Minister

with transport magnify their problems of exclusion. This is because car ownership is low in a high proportion of households relative to national figures.

Within urban areas in particular, characteristics associated with low incomes and poverty are present. Lone parents comprise a relatively high proportion of households with children under 16 years old. In April 2004, 21% of households received Council Tax Benefit. In two wards the figure exceeded 30%. Taking all benefits administered by the Council, 44% of those claiming are pensioners.

The housing stock is varied with 48% of housing being built before 1919. Predominately the housing is owner-occupied with low levels of detached and semi detached houses, the biggest proportion being terraced housing with, in some cases, very little outside space to accommodate refuse bins.

The Borough's traditional economic base starting in the 18th Century was founded on general textiles and cloth manufacture with the following addition of mechanical engineering, as Halifax became a noted manufacturer of machine tools of high quality. Added to this in the textile sector was the huge output of woven carpets by Crossleys and sweet production by Mackintoshes. Service industries and finance is more important today with the growth of the Halifax Building Society into Halifax Bank of Scotland (HBOS).

However, almost 25% of the working population is still engaged in manufacturing a figure that far exceeds national and West Yorkshire levels.

Table C - Major Private Employers in Calderdale[4]

September 2004	**Number of Employees**
HBOS	6,000
Marshall plc	1,050
Nestle UK	800
Crosslee plc	600
Provident Insurance plc	480
Avocet Hardware	450
Weir Warman Ltd	360
Advanced Processing Ltd	350

More men than women are in work, although both sexes are tending to work part time. Average pay is below national hourly rates but above West Yorkshire averages, workers are more mobile with 31% working outside the Borough, and 38% coming into the Borough to work. The overall unemployment rate in Calderdale is 2.1%[5] well below the regional average and just under that for the UK. In Calderdale, one in nine people who are unemployed have been out of work for more than 12 months, and more than a quarter are under 25 years old. A sample survey in 2001 showed a far higher rate of unemployment within the ethnic minority population.

[4] Calderdale Council Companies Database
[5] September 2004

The Authority's main backbone trunk route up the Calder Valley the A646 becomes congested at times and the rural feeder roads to this backbone are in general narrow and steep rising up the valley sides. The M62 runs along the southern edge of the Authority with numerous junction points making access to the national motorway network reasonably easy, particularly at the eastern end of the Borough. Congestion at peak times in the morning and evening on the M62 is however becoming a problem and a fourth lane is being considered at this time.

The Council's Corporate Plan 2006 – 2009[6]* has six corporate priorities, one of which has a direct bearing on this Strategy report, that is:

Corporate Priority (CP) 6:
Promote sustainable economic growth and respect for Calderdale's heritage and develop a clean and attractive built and natural environment.

Thus resulting specifically in the following objectives and targets CP 6.5
To minimise waste and increase recycling rates, including the following objectives and targets

With the sub objectives CP 6.5.1/BV84/FP5.4.1/CPA - the number of kilos of household waste collected per head of population. 05/06 457kg, 06/07 466kg, 07/08 475kg and 08/09 484.5kg; and

the sub objectives CP 6.5.2/BV82a+b/FP5.4.2/CPA - The percentage of household waste recycled or composted. 05/06 20%, 06/07 20%, 07/08 25% and 08/09 28%.

Whilst not having a direct and explicit bearing on waste strategy, the need to improve customer service as a Council priority will impact on this waste strategy.

Other important initiatives have included the creation of Pennine Housing 2000, a Registered Social Landlord, to look after all former Council owned housing and other accommodation and Integrated Children's Services to administer to the needs of children which enables the integration of all children's services including health, education and social services. Waste management has also been changed by the outsourcing of the Council's waste services function to FOCSA Services (UK) Ltd and contracts have been awarded to three companies for the end disposal of waste.

1.2 Waste Management Background

The Local Government Act 1972 brought about a major reorganisation of Local Government services in England and Wales. Small Urban District Councils and Rural District Councils were amalgamated to form much bigger Local Government units. In addition the Act created a two tier system of Local Government, where County Councils were responsible for strategic services on a county-wide basis (e.g., police, fire, passenger transport, highway maintenance, waste management etc) whilst District Councils were responsible for more localised services (e.g. housing, local planning, regeneration, recreation, refuse collection).

[6] Calderdale Council Corporate Plan 2006 - 2009

Of the upper tier county authorities, six were designated Metropolitan County Councils, and covered the major conurbation areas (excluding Greater London). West Yorkshire Metropolitan County Council (WYMCC) was one of these authorities and came into being on 1st April 1974.

In statutory waste terms, the County Councils were the Waste Disposal Authority (WDA), whilst the District or Borough Councils were the Waste Collection Authority (WCA).

On 1st April 1986 the Metropolitan County Councils were abolished, and the WDA function devolved to the City, Borough and District Council level. In West Yorkshire the Councils concerned (and which geographically together made up the West Yorkshire Metropolitan County Council area) were Bradford, Calderdale, Kirklees, Leeds and Wakefield. These five Councils together decided to delegate their new duties as Waste Disposal Authorities to a Joint Committee. This gave rise to the West Yorkshire Waste Management Joint Committee (WYWMJC).

WYWMJC continued the previous WYMCC strategy of disposing of waste to landfill this being the cheapest option at that time. WYWMJC purchased the sites, engineered them to the required standards and operated these sites using their own support and specialist staff.

Local geology and the closure of old mineral workings ensured that major future landfill sites would be located in the eastern and south eastern parts of the County. As the major conurbation areas were in the northern half of the County, (Leeds and Bradford), transfer stations were developed to allow the bulking up and onward transport by road of the local waste arisings to the distant landfill.

This policy had a number of advantages:-

- transfer stations can be located near to waste arisings in the case of Calderdale the waste transfer stations were located at Eastwood between Hebden Bridge and Todmorden to serve the western end of Calderdale and Halifax to serve the eastern end;

- wear and tear to the collection vehicles was reduced by the vehicles not having to access the landfill sites;

- unexpected/unplanned operational problems at landfill sites could be reduced by having buffer capacity within the transfer stations, thus preventing disruption to the refuse collection service.

Upon the implementation of the Environmental Protection Act 1990 (EPA) local authorities were instructed to divest themselves of the waste disposal function. Operational landfills were privatised and this requirement precipitated the demise of WYWMJC on the 31st March 1998. Waste Disposal Authority functions were transferred to the five Councils comprising West Yorkshire and from 1st April 1998

Calderdale MBC became a Unitary Authority in waste terms, being both a WCA and WDA.

In 1998 to comply with the EPA requirements, the Council let a number of contracts for landfill disposal to the private sector, the waste being delivered via the transfer station network described earlier, from Eastwood and Halifax, to landfills outside the Calderdale boundary, a situation that continues to this day.

1.3 Present Situation

Calderdale Metropolitan Borough Council (CMBC) covers an area of 140 square miles (36,346 Ha), and contains some 87,908[7] domestic properties producing 93,798[8] tonnes per annum of domestic waste, of this 35,261 tonnes arises from Household Waste Recycling Sites (HWRS – formerly known as Civic Amenity Sites), of which there are 5 within the Borough. The balance of 58,030 tonnes mainly arises from the waste collection service, where all domestic properties are provided with a bin liner, which is collected weekly. In addition there is a bi-weekly kerbside collection, of recyclable waste from 95% of properties in the Borough.

All the waste is delivered directly to the 2 transfer stations Eastwood in the west and Halifax in the east. The waste is bulk loaded and transported by road to distant landfill sites of which the Authority has access to three, one primary contracted site and two secondary contracted sites all of which are in Lancashire. The contracts referred to above will continue until 31st July 2013 in the case of the primary contract and 31st July 2008 in the case of the secondary contracts. The primary contract guarantees the landfill operator 700,000 tonnes of which it is anticipated 600,000 tonnes will have been delivered by 31st March 2008.

The Council achieved a recycling/composting rate for domestic waste of 17.2% for 2004/5 and has a statutory target of 18% for 2005/6.

To achieve the 18% recycling target, the Council employs a number of initiatives, which are discussed in greater detail in Section 2. These are:

- a diversion rate of nearly 38%[9] is achieved at HWRS;
- a kerbside recycling scheme based on paper and glass is provided to 57,000 domestic properties on an opt out basis;
- a Kerbside recycling scheme based on five materials (paper, glass, cans, textiles, and shoes) is provided to 25,000 domestic properties on an opt out basis;
- bring recycling sites are provided across the Borough at 19 sites (Appendix 2)

[7] As of 1.4.05
[8] Year 1.4.04 to 31.3.05
[9] Data Monitoring Officer – 2004/05 return to the Environment Agency

- a home composting scheme is actively marketed across the whole of the Borough with some 12,460[10] composters having been sold to residents within the Borough at a highly subsidised rate.

Details of the Council's waste management performance indicators are given in 1.6 below.

1.4 Waste Composition

The National Waste Strategy (WS2000) states that "approximately 25 million tonnes of household waste is produced in England and Wales each year. The range of materials included in this waste is large."

Waste Strategy 2000 reproduced the following typical household waste composition:

- 32% paper and card;
- 21% putrescible wastes;
- 9% glass;
- 8% miscellaneous combustible wastes;
- 7% fines;
- 6% ferrous metals;
- 6% dense plastics;
- 5% plastic films;
- 2% textiles;
- 2% non-ferrous metals;
- 2% miscellaneous non-combustible wastes.

It is interesting to compare with Calderdale's own analysis reproduced below in Table A[11], the main differences being paper and card at 21% compared to 32% above, but with greater putrescibles at 33% compared to 21% above.

In 2005 via Community Recycling Services (CRS), Save Waste and Prosper (SWAP) Leeds office was commissioned to undertake an analysis collected domestic wastes in Calderdale. The overall aims were to look at:

- the composition of waste put out for disposal and to establish whether there were any differences between Calderdale's waste and that given in the national statistics;

- to see if this might adversely affect any waste disposal process or prejudice any opportunity for joint working with another Authority;

- clearly identify what waste is potentially available for recycling;

- examine the variation if any, across the Authority's geographical area

[10] As of 31st December 2004.
[11] Done October/November 2005

- provide a compositional benchmark for future comparison.

In terms of overall weight of waste put out for disposal, households produced 12.96kg/week, with the number of bags generated per household per week averaging 2.61. The analysis showed that the households in ethnically diverse communities produced 27.03 kg/week of waste, while the average in non ethnic communities was 10.95kg/week. However after household size[12] has been taken into account within the waste data sample it is believed that more convergent results will be obtained.

The report estimated that 40.3% of the authorities waste is suitable for recycling, with an additional 22.1% suitable for home composting, and 15.1% compostable using in-vessel systems, resulting in a total of 77.5% being recoverable by these means.

The overall waste composition for waste collected for Calderdale is detailed below in Table A.

Table D - Summary SWAP Waste Composition Analysis Calderdale

Material	**Kg per household/week**	**% by weight Calderdale**	**% by weight National Figures**
Paper and card	2.73	21	32
Plastic film	0.66	5	5
Dense plastic	0.95	7.3	6
Textiles	0.66	5.1	2
Shoes	0.09	0.7	
Misc. combustible	1.20	9.3	8
Misc. non-combustible	0.08	0.6	2
Glass	0.66	5.1	9
Ferrous metal	0.44	3.4	6
Non-ferrous metal	0.14	1.1	2
WEEE	0.17	1.3	
Putrescibles	4.26	32.9	21
Fines	0.92	7.1	7%
TOTAL	12.96	99.9	99.9

In overall terms, the survey found the average biodegradable content of kerbside collected residual waste to be 53.9%, (which is much lower than the 68% being used by Government for the Landfill Allowance Trading Scheme (LATS)).

Household Waste Recycling Centres

Some 35,261 tonnes of waste (38% of the Borough's domestic waste) arises from Calderdale's Household Waste Recycling Sites (HWRS).

[12] The Corporate Research Section has been asked to re-examine the data.

This is an unusually high proportion of a Council's waste arisings to obtain from this waste source, highlighted by consultants employed to produce a Best Practical Environmental Option[13] (BPEO) into future waste management options. Acting on this report Calderdale have commissioned Jacobs Babtie, consultants, to carry out a study as to the best means of dealing with this current situation. This study[14] has the following objectives to:

- Better identify the origins of waste passing through the HWRS
- Examine current layout to:
  - (a) increase the throughput made available for recycling
  - (b) enhance visitor safety and experience
  - (c) reduce visit times

- Examine storage methods used for optimum recycling/capacity
- Examine site management practices to see if human resource utilisation is at an optimum.

The results of the study should enable Calderdale to:

- Formulate better future waste acceptance policy;
- Ensure that legitimate tonnages are dealt with more efficiently;
- Recycle a greater proportion of this waste stream;
- Increase tonnages of recyclates;
- Increase visitor capacity;
- Enhance BVPI 82a and b.

It will also inform policy on the heaviest fractions[15] and show the relative percentage of the following wastes which are usually deposited at HWRS.

• electrical and electronic equipment	1.46%
• green waste	12.71%
• mixed household (bin waste)	62.30%
• hardcore/rubble	12.78%
• paper & cardboard	3.35%
• metal	3.08%
• glass	2.09%
• wood	1.92%

The report may suggest that well resourced and staffed HWRS sites should be able to achieve a landfill diversion rate of at least 60%.

[13] BPEO Study – "Calderdale: Options Appraisal for Residual Waste", Eunomia Consulting & Research 2005.
[14] Expected December 2005.
[15] Data Monitoring Officer - 2004/05 figures.

1.5 Present Operational Arrangements and Infrastructure

The Council acts as both a WCA and WDA and has a duty under the Environmental Protection Act 1990 Section 45 & 48 to collect, treat and dispose of municipal waste. In Calderdale's case the collection, bulk transfer loading operation and delivery to the landfill site(s) for ultimate disposal is carried out by the Council's private contractor FOCSA Services (UK) Ltd. Contracts for end disposal of wastes collected by FOCSA are with Onyx, Waste Recycling Group (WRG) and Viridor.

Scale of the current operation

In 2004/5 the Council processed 93,798 tonnes of municipal waste. This figure has increased steadily since 2000/1 with an overall increase of 12.54%[16] for household waste. The Council does not provide a trade waste service; this element of the local waste management is provided by FOCSA Services (UK) Ltd and is integrated by them into their daily operations, but kept financially separate from services provided by them to the Council.

Table E - The total approximate arisings from various sources as listed below:

		Tonnes Per Year 2004/05
1.	Refuse Collection including recycling	54509
2.	Bulky Collections	1509
3.	Household Waste Recycling Sites	35,539
4.	Bring Sites	1244
5.	Household Clinical Waste	159
6.	Environmental Cleansing	838
	TOTAL	93,798

Table F - Disposal Routes for Waste and Recycling

	Tonnages Per Year 2004/05
1 Landfill	75,654
2 Composting of Green Waste	5,507
3 Dry recycling	10,486
4 Energy from Waste	2,151
TOTAL	93,798

[16] Data Monitoring Officer – Excluding commercial waste tonnages.

Facilities Used To Handle Waste

Waste Services

The Council provides a number of interconnected waste collection services through the Waste Services Contract. Operating from Headquarters at Battinson Road Halifax for senior support staff and collection crews together with their collection vehicles. The contract manages approximately 93,798 tonnes of waste per annum.

Domestic Refuse Collection

The domestic collection service is delivered with 15[17] operational rounds. The rural areas representing 80% of the Borough are serviced by 5 of the 15 rounds.

The weekly service collects annually 50,946[18] tonnes of domestic waste from 87,908 households.

Recycling

The Council provides two kerbside recycling services in the Borough. One service is provided by FOCSA Services (UK) Ltd direct to residents and the other by Kerbside (Calderdale) Ltd (a social enterprise not for profit company) working as a sub contractor to FOCSA.

The FOCSA direct service is offered to over 57,000 households in the eastern side of the Borough collecting glass in a 55 litre box and paper in a reusable bag.

The Kerbside service is offered to over 25,000 households in the western area collecting 5 materials (paper, glass, card, textiles and shoes) again in a 55 litre box.

Both collection services use 7.5t gross vehicle weight vehicles with six stillage baskets for sort materials. Sorting is undertaken at the kerbside where possible.

Kerbside add value to the materials they collect by further sorting at their depot before selling to the market.

FOCSA bulk up their collections into 40 yd^3 containers at Atlas Mill HWRS before transporting to merchants.

Both services operate on a two weekly basis. In this way a collection service for at least two materials is offered to 95% of households. In addition, 19 “bring to“ sites are placed at supermarkets and other community based sites providing containers for glass, paper, card, textiles, and shoes. These are emptied by FOCSA or directly by merchants who supply the containers.

[17] That is 15 vehicles x 5days = 75 different geographical rounds.
[18] 2004/05 figure.

Bulky Household Collection

One dedicated bulk collection crew collect 1,000 tonnes of bulky waste from around 6,000 requests per annum.

Clinical Waste

Clinical waste is collected from approximately 950 private addresses per week throughout the Borough using a dedicated collection vehicle and driver.

Chemical Disposal

Under an existing joint working arrangement Bradford Metropolitan Borough Council's Chemical Advisory Service (CAS) disposes of chemicals found or requiring disposal by Calderdale residents emanating from their premises. Charges for this service are paid for by CMBC.

This Bradford MDC chemical advisory service inspects, investigates, consigns, transports and correctly disposes of small quantities or unwanted chemicals including.

- Pharmaceuticals
- Herbicides
- Poisons
- Chemical reagents
- Unidentified powders and liquids.

Waste Treatment and Disposal Services

The collected waste is handled in a variety of ways depending upon its source or waste stream, some is recycled, the remainder of the residual waste (some 80%) is currently being sent to landfill. The handling is carried out at the two Transfer Loading Station (TLS) sites and also at the Atlas Mill Road HWRS where the two weekly collected recyclate is bulked up for onward sale to merchants.

Transfer Loading Stations

There are 2 transfer loading stations:

(i) Halifax TLS, Shroggs Road which handled 64,229 t/pa[19] plus some recyclate.
(ii) Eastwood TLS Todmorden which handled 13,069 t/pa[20]

Halifax TLS is the largest of the authority's TLS sites and has full facilities including a weighbridge, large refuse hall, trailer park, a consented leachate disposal point, workshop, storage for a variety of wastes and a separate but adjacent HWRS for local residents, locker room and staff messing facilities. Bulk trailer drivers operate from here.

[19] 2004/05
[20] 2004/05

Eastwood TLS is much smaller and therefore has limited facilities, having no weighbridge or trailer parking area, it basically consists of a small refuse hall, side garage, small mess room, and limited recycling facilities in the car park and service road.

These sites are purpose built facilities, capable of categorising waste into type, source and destination. The sites utilise large items of plant and load Municipal Solid Waste (MSW) into 44 tonne road haulage trailers for dispatch to distant landfill sites. The transfer loading stations are open 362 days per year.

Currently Calderdale transports waste from both Halifax TLS and Eastwood TLS to the primary contracted site at Highmoor, Lancashire operated by Onyx and also as operational circumstances dictate to Deerplay operated by WRG near Burnley, and Pilsworth operated by Viridor near Heywood in Lancashire. The Highmoor Contract requires that a guaranteed tonnage be delivered before the end of the contract in July 2013, this will be achieved. There are no suitable landfills in the Calderdale area.

A household waste recycling centre is also provided at each transfer station.

The transfer sites also receive waste directly from traders and commercial waste collections for which the contractor levies a charge. This activity is separated from the Council's operations.

Household Waste Recycling Sites

There are 5 sites located throughout the Borough. The sites are open for the public to use to dispose of bulky or excess waste and to deposit materials for recycling (these sites are not available for traders to use).

Appendix 3 lists their locations, operating times and the recycling facilities provided.

These sites are open 7 days per week, 362 days per year and are serviced by 32 tonne container handling vehicles.

The quality of the sites infrastructure is poor, having little space for further expansion. All the sites are in urgent need of improvement to their layouts, configuration, and user friendliness to encourage increases in recycling performance from 38% in 2004/05 to at least 50% per site.

Contract Management

Contract management has two modes. One mode between CMBC and FOCSA and another mode between CMBC and the landfill site contractors.

Mode one contract management with FOCSA, the Council's contractor for waste and recycling services include the management of collection, transfer loading, HWRS and bring-site services, bulky collections and clinical waste. Such management is conducted by a client team of officers who manage the performance of the contract.

All recycling contracts with recyclate merchants and processors are directly managed by FOCSA Services (UK) Ltd.

In addition to contact on every day management services, frequent liaison occurs with FOCSA, when making waste management funding bids to the Department of Food and Rural Affairs (DEFRA) to pay for technical studies, extra services, or to generally help provide improved waste management provision within the Borough.

Mode two contract management occurs directly between CMBC and the three private contracted landfill companies who take the MSW transported to site by FOCSA Services (UK) Ltd. Calderdale manages this interface to ensure that FOCSA have good access to sites at all times, with minimum disruption, turn round times, and delivery vehicle damage.

Thus disposal contracts for deposit of waste to landfill are directly managed including:

(i) one major contract for landfill with Onyx (described below);
(ii) two subsidiary contracts at two other sites with Viridor and the Waste Recycling Group (WRG).

Brief details of the two sets of landfill contracts are:

- landfill disposal - primary contract with Onyx duration to 31st July 2013, with a minimum tonnage guarantee of 700,000 tonnes before conclusion of the contract;

- landfill disposal secondary contract with Viridor at Pilsworth near Heywood Lancashire to 31st July 2008;

- landfill disposal secondary contract with WRG at Deerplay near Burnley to end 31st July 2008.

All the disposal contracts have an option to extend for a further 6 months at the discretion of the Council.

Landfill Aftercare

The service is also responsible for looking after the legacy of previous landfilling of municipal wastes within the Borough, including site restoration and maintenance, and environmental control measures to deal with landfill gas and leachates.

Calderdale has 6 closed sites that require regular attention including Shroggs Road Halifax, Cockhills Shelf, Cromwell Bottom North Bank Loop Brighouse, Cromwell Bottom Tag Cut, Scout Road Mytholmroyd, and Woodhouse Road Todmorden.

Cromwell Bottom North Bank Loop will require landfill capping within the foreseeable future. Capping will reduce leachate accumulation within the site. Cromwell Bottom will be connected to sewer shortly and will require a gas flare installation at some stage provided the gas generation does not continue to decrease, which is the current

situation. Continual monitoring and recording of the leachate discharged to sewer at Woodhouse Road will be required with associated maintenance and engineering works as needed from time to time.

This aftercare will continue for many years into the future and includes environmental monitoring, which involves the collection of field data via monitoring equipment, its subsequent collation and interpretation, culminating in a quarterly report to the Environment Agency.

Pest Control

For the sake of a complete description of the staffing levels within the section staff relating to Pest Control are included within this section. The staff in Pest Control inspect the landfill sites under Calderdale control to ensure that the closed landfill sites continue to be kept free from pestilential infestation.

Staffing Levels within the Service

Table G - Staff breakdown per service area as full time equivalent:

Service Area	**Staff FTE**
Administrative Support & Communications	4.3
Collection Contract Manager	1
Data Monitoring Officer	1
Landfill Aftercare	1
Landfill Contract Manager	1
Pest Control	3
Recycling Officer	1
Refuse Collection Inspectors	2
Waste Awareness & Education Officer	1
Waste Manager	1
Waste Strategy Manager	1

1.6 Current Waste Management Performance Indicators

Best Value Performance Indicators (BVPIs) relating to waste management are collated by the Service and reported to Central Government. These BVPI's contribute to the Council's Comprehensive Performance Assessment (CPA) and allow Central Government to benchmark Calderdale Council and monitor our performance.

Table H - Waste Management Best Value Performance Indicators

Listed below in Table H are Calderdale's BVPIs relating to Waste Management for the years 2002/3, 2003/4 and latest 2004/5.

BV Ref Indicator	Description	02/03	03/04	04/05
82a	recycled (%)	7.57	8.58	11.18
82b	composted (%)	4.59	5.04	5.87
82a+b	Recycling rate (%)	12.16	13.62	17.05
82c	energy recovery (%)	2.7	2.52	2.23
82d	Landfilled (%)	84.98	83.67	80.66
84	household waste collected per person (kg)	481	461	485
86	cost of household waste collections per household (£)	26.63	33.74	37.76
87	cost of waste disposal per tonne (£)	41.39	46.88	45.91

The Government has set (and will continue to revise and review) performance standards relating to such areas as recycling and composting, along with specific guidance as to how definitions for these indicators are to be calculated e.g., what materials count and how they should measured.

The current statutory recycling target (2005/06) BV82(a) + (b) for Calderdale is 18%. Clearly the achievement of BVPI targets will be a very important feature in any long term strategy for Calderdale's waste.

2.0 STRATEGIC REVIEW

2.1 National Context

The UK Government being a signatory to the EU Landfill Directive transposed the Directive into UK legislation by adopting a variety of measures. A strategic measure was a document called "Waste Strategy 2000" which sets out a roadmap for UK authorities in relation to waste management practices. Briefly this document sets a number of targets for local authorities related to increasing recycling, composting, and the recovery of value from waste. Such a change in direction should reduce but not eliminate the need for landfill as an ultimate means of disposal.

Prior to "Waste Strategy 2000" Landfill Tax was introduced some 4 years earlier in 1996. This is an escalating tax which began at a rate of £7 per tonne in 1996 for biologically active wastes and by 2005 this tax has reached £18 per tonne. In the future this tax will at present rates of escalation increase to £35 per tonne by 2013. The forward figures assume that a review of this tax in 2007 will not increase the yearly escalation rate for this tax upwards from £3 per year.

In addition to the pressures impressed onto local authorities by "Waste Strategy 2000" and the Landfill Tax (LT), the recent introduction of the Landfill Allowance Trading Scheme (LATS) in 2005 has significantly increased the pressure to try to divert waste away from landfill, to other mass reduction processes. Briefly and in passing, it is estimated that in Calderdale's case, if the Authority fails to divert sufficient tonnages away from landfill, that Calderdale could face potential charges as high as £2.6m in the two years from 2009/10 and 2010/11.

In November 2002 the Government produced a report entitled "Waste Not Want Not"[21] with 34 original recommendations for the more sustainable management of wastes within the UK. The report was the executive arm of Government reaction to a perceived slow response to "Waste Strategy 2000". DEFRA responded to this report in 2003.

The DEFRA report resulted in an Action Plan with 34 recommendations which included:

- general funding being available under the Waste Implementation Programme (WIP) to promote better waste management, technical investigations and studies to improve waste planning and infrastructure at local level;

- a rise in landfill tax escalator of £3 per year instead of the original figure of £1 per/year;

- the introduction of the Landfill Allowance Trading Scheme (LATS) to require local authorities to divert waste from landfill;

- developing proposals for alternative indicators that incorporate waste reduction i.e. Best Value Performance Indicators (BVPIs);

[21] Prime Ministers Strategy Unit November 2002

- allowing local authorities to take forward incentive schemes to reduce waste and increase recycling.

In Calderdale this has resulted in initiatives involving, composting, recycling, waste reduction, waste analysis, and waste management studies of various types.

2.2 Regional/Sub Regional Situation

The Yorkshire and Humberside Regional Waste Strategy[22] (YHRWS) entitled "Let's Take it from the Tip" was published in July 2003. The strategy gives priority to reducing waste and comments that the accepted growth rate of 3% p.a. should be reduced to 2% by 2008/9. If this reduction in growth is not achieved then it is estimated that by 2020 there will be twice as much waste as there was in 2003. The YHRWS figures for the capacity of waste management facilities; the recycling/composting rates achieved and the residual waste quantities that will require management are based on the assumption that it has been possible to reduce the local waste growth to 2% p.a. by 2008/9.

The YHRWS suggests that after giving priority to reuse, residual waste[23] can be dealt with in a number of ways including energy from waste, landfill, and new technologies, such as mechanical and biological treatment (MBT). It makes the point that strategic **flexibility should be retained** "*when deciding the most appropriate options for the future"* as the new technologies **are emerging** and *"are likely to offer more sustainable residual waste management options"*.

The Strategy also gives guidance on the type and the capacity of waste management facilities that will be needed on both a regional and sub-regional basis until 2018. Included in the document is an Action Plan.

The four objectives of the Regional Waste Strategy are to:

1. gain community support and involvement in the delivery of the Strategy (e.g., to implement a regionally based waste awareness campaign); points made here include

    - by engaging all sectors of the community;
    - by raising public understanding and engaging householders and business to reduce waste and increase reuse and recycling;
    - by utilising community organisations;
    - by carrying out research to explore models that local authorities can use to work with the community sector whilst still taking account of local authorities need to comply with financial, statutory, and contractual parameters;

2. reduce waste production and increase re-use, recycling and composting (e.g., reduce annual increase in municipal waste production to 2% by 2009); it notes here that:

[22] Yorkshire & Humberside Regional Assembly July 2003

[23] That waste that remains after reuse, recycling, composting, EfW, or as a remaining minor or useless fraction occurring after pre or intermediate treatment.

- the 2% target will be challenging;
- even if the target is achieved there will be an overall increase in waste because there is a predicted increase in household numbers;
- a broad variable charging schemes that charge householders according to the quantity of waste that they produce are effective in reducing waste growth;
- the YHRWS planning guidance has a limited role in waste reduction, however it can encourage building reuse, the use of recycled aggregates and other building materials;
- the initial objective of the region is to meet at the minimum the UK policy and legislative recycling targets and requirements and that this initial stance will be reviewed in future;
- regional recycling targets are.

Table I - Yorkshire and Humberside Regional Waste Strategy Regional Recycling Targets for Municipal Waste

Year	Total MW Recycled
2005/06	21%
2010/11	30%
2015/16	33%

- it is recommended that local councils introduce widespread kerbside collection schemes that reach as many communities as possible without excluding rural or socially disadvantaged areas and that schemes should be expandable to meet higher future targets;

- planning for new facilities is likely to be subject to delay and public opposition;

- industrial and commercial wastes recycling should be increased;

- that regional markets for **quality** recyclate must be developed and robust and asserts that Regional Planning Guidance supports this objective;

- employment opportunities will arise from materials reprocessing.

3. Manage residual waste in a sustainable way; to do this

- the strategy notes the impact of tighter legislative controls on how much and what type of wastes can be disposed of to landfill;

- the strategy estimates that regional existing licensed landfill capacity is sufficient until 2007/8;

- the strategy notes that mass burn incineration is thought to be unpopular with the communities in the region and that such facilities require 25/30 year contracts

that may inhibit reuse and recycling. Further that research done for the YHRWS shows that if EfW becomes a preferred option for municipal waste then the need for facilities will reduce from 15 in (2005/6) to 5 in (2015/16) assuming that composting and recycling increase to comply with targets;

- over the next 5-15 years other forms of residual waste thermal treatment, such as gasification, pyrolysis and MBT are **likely** to become technically feasible and **commercially** viable. These treatments could offer more sustainable methods than landfill or incineration for dealing with the residual waste;

- it should be acknowledged that the way forward may include a need for some increased capacity for EfW plants but these should be kept to a minimum. Small local 50,000 tonne plants are feasible. Such plants should only be developed after or alongside projects to improve waste reduction, reuse, recycling and composting;

- it suggests local authorities should assess local need by the use of various assessment methods that is carry out BPEOs, sustainability appraisals and health impact assessments when formulating or reviewing municipal waste management strategies (MWMS).

4. Provide technical support and advice. This will be achieved by

- acknowledging that waste management will continue to be the subject of new EU and UK Government legislation;

- a service to interpret the implications of forthcoming legislation;

- the creation of local information networks involving local organisations, local authorities, and waste management businesses;

- developing regional planning advice on waste issues, feeding information to public inquiries, and monitoring the effectiveness of planning guidance.

2.3 Best Value

In 1999 Government introduced legislation implementing the 'Best Value' regime. The legislation requires Councils to improve the services they provide year on year, by ensuring that the type, quality, and level of service provision meets the publics demands and that the cost of services provided are reasonable and efficient.

In the last four years the waste management services of Calderdale Council have been the subject of two Best Value Inspections, the first in the February 2001 and the second by the Audit Commission at the invitation of the Council in October 2003. The first Inspection by the External Review Team found that the Council was *"providing a fair one star service that is unlikely to improve"*. The second review in 2003 found the Council to be *"providing a fair one star service that has promising prospects for improvement."*

The latest judgement was based on the following findings:

- the aims of both waste management and street sweeping are clear and put customer outcomes as key considerations;
- the Council is on track to achieve the statutory targets for recycling, and has set higher personal targets;
- the Council is working with partners both within Calderdale and regionally to ensure alignment with other strategies such as the YHWMS and the Calderdale Futures Plan;
- the Council is actively seeking to improve the street cleansing Best Value Performance Indicators (BVPIs);
- the Service has achieved better performance on recycling & composting and therefore reduced landfill;
- the Council is working towards waste minimisation;
- the new contract for waste collection and disposal contains financial incentives to keep recycling above 14%;
- there is positive evidence of public satisfaction with the present method of refuse collection;
- the Council has taken bold steps to enforce litter and dog fouling laws;
- street sweeping has been reorganised;
- the household waste sites have extended opening hours and improved facilities.

In the opinion of the inspectors areas of weakness, that detracted from the judgement were:

- although the need for waste diversion was recognised by the Council there was little evidence that they were looking at all the options for the short term diversion of wastes away from landfill or that the declared recycling targets post 2005/06 would be sufficient to meet the diversion from landfill targets;
- waste collected from households is high and continues to grow faster than the national average and the Council does not have a clear or approved waste minimisation strategy;
- information that could drive service improvement is not available;
- the Council transferred the Trade Waste business to the successful tenderer thus loosing the potential to generate income to cross subsidise the waste collection service;
- the Council decided not to test the market for a more integrated, longer term, solution to its waste management needs;
- performance monitoring has not yet been introduced for the new contract;
- latest audited and published cost and performance data demonstrates mixed performance.

The view that the Service *" has promising prospects for improvement."* was justified by:

- evidence of political, staff, and financial commitment to waste management services;
- the Council is working towards implementing many of the strategies and targets designed to drive improvement;

- the Council has a robust process for monitoring key targets;
- the Council is prepared to take tough decisions;
- the Council has in place and supports a number of education and waste prevention activities;
- the Council carries out a range of effective enforcement activities;
- private sector partners confirm an effective relationship with the Council.

The eight recommendations of the 2003 review required the Council to

- increase its efforts to increase customer focus and service effectiveness;
- continue to develop its IT systems to improve both customer access to the service and data collection to improve service improvement decisions;
- develop service standards for waste management and communicate same to the public;
- ensure the Service learns from best practice both internally and externally;
- develop detailed options for its medium and long term waste collection and disposal requirements in consultation with the public and other public and private sector partners;
- develop a fully researched detailed action plan which focuses on key areas that will deliver the Council's priorities;
- identify and reduce duplication in Council Departments;
- introduce robust contract performance monitoring systems for the waste contract.

2.4 Planning Regime and Land Use

Planning Policy Statements

Planning Policy Statements (PPS) define the UK Government's national policies on various aspects of land – use planning in England. The recently published Planning Policy Statement 10:[24] *Sustainable Waste Management* (PPS10) supersedes the Planning Policy Guidance Note 10 (PPG10), *Planning and Waste Management*, published in 1999. Policies in PPS10 should be taken account of by waste planning authorities.

PPG23[25] Planning and Pollution Control has also been superseded by PPS 23 (2004), which compliments the new pollution control framework under the Pollution Prevention and Control Act 1999 and the PPC Regulations 2000. This policy statement entirely replaces the original document with a wholly different approach by reducing the degree of technical involvement of planning with the actual waste process itself.

The Land Use Planning system is now designed to control the development and use of land, whilst achieving sustainable development and waste management decisions. **Traditionally, waste planning has not been given the attention** that housing or industrial development has received. This has now changed and waste planning is an important part of the planning regime.

[24] Office of the Deputy Prime Minister, Planning Policy Statement 10: *Planning for Sustainable Waste Management*, July 2005
[25] Office of the Deputy Prime Minister, Planning Policy Guidance Note 23: *Planning and Pollution Control,*1994.

National planning policy now indicates that Waste Planning Authorities cannot consider the needs of their own areas in isolation. This is because sustainable waste management solutions by reasons of lack of local land availability and the need for economies of scale in tonnage terms, may require that wastes cross from one area of planning responsibility to another, to achieve an efficient outcome.

The YHRWS reiterates the Government view[26] *"that most waste should be treated or disposed of within the region in which it is produced,"* The well-known proximity principle. However this does not mean that waste cannot be moved sub regionally from one local authority area to another should such an arrangement provide a sustainable waste management solution to a local problem.

Planning Policy Statement 10 *Planning for Sustainable Waste Management*

The PPS provides advice on how land use should contribute to sustainable waste management via provision of suitable waste facilities. The guidance does not specify a particular waste technology, this being a local decision, but that the decision should be an informed one taking account of a Sustainability Appraisal[27] (SA) and Strategic Environmental Assessments (SEA).

The guidance sets out the criteria for the siting of waste facilities aimed at dealing with controlled wastes (which includes municipal wastes) and the relationship between planning systems on the one hand (land use) and the waste management licensing regime (controlled by the Environment Agency) on the other hand.

PPS 10 takes a **flexible** approach to waste management and incorporates the latest thinking on waste management by incorporating new ideas into policy implementation. New or increased emphasis is placed on:

- sustainable waste management;
- the "waste hierarchy"[28];
- enabling waste to be disposed of nearest but not at its origin;
- waste management to be considered with other spatial planning concerns such as transport;
- planned provision to be based on regional data analysis;
- planning controls and pollution controls to compliment each other;
- PPSs to take precedence over existing local plans;
- Regional Spatial Strategies (RSS) to take account of waste arisings across the whole region;
- the "*likely demand for waste management capacity arising from neighbouring regions, and where relevant Wales & Scotland, where meeting this demand would be consistent with policies in this PPS";*
- tonnages of waste "*to be apportioned by waste planning authority area or to sub-regions";*

[26] YHRWS page 38.
[27] Sustainability Appraisals (SA) now replace Best practicable Environmental Option (BPEO) studies
[28] Waste Hierarchy in priority Reduction, Reuse Recycling & Composting, Energy Recovery, Disposal

- any need for a specialist facilities to serve the whole region e.g. residues from treated waste;

The difficulty in identifying land for waste management facilities has received considerable attention in PPS10 so that:

- Waste planning authorities should identify in development plan documents sites and areas suitable for new or enhanced waste management facilities.
- At least ten years forward capacity planning as set out in the RSS should be used.
- Regard should be given (without necessarily the consideration of compulsory purchase orders), to unrealistic assumptions for the development of areas for waste management facilities where ownership difficulties exist.

In determining planning application consistent with up to date development plans planning authorities should not require the applicant to demonstrate a market need and if local plans are not up to date, allow applications that are consistent with PPS10. PPS10 takes precedence. In addition a potential site not included in a development plan should be considered favourably provided it is consistent with PPS10 and the planning authority's core strategy.

Planning Policy statement 23 *Planning & Pollution Control*

PPS23 seeks to avoid conflict and duplication between control regimes. The planning and pollution control systems are separate but complementary, in that both are designed to protect the environment from the potential harm caused by development and operations.

Pollution control is concerned with the prevention of pollution through the use of measures to prohibit or limit the release of substances to the environment, thus planning conditions should not be used to regulate the technical aspects of a waste processing site, more properly planning rules should control transport modes, landscaping, buildings, noise, vibrations and odour, so that the planning system controls the development and the use of land in the public interest. The planning system focuses on whether the development itself is an acceptable use of land and impacts of those uses, rather than the control of processes or emissions. Local planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced.

Regional Planning Bodies and Local Planning Authorities need to adopt a strategic approach to integrate land-use planning processes with plans and strategies for the control, mitigation and removal of pollution as far as practicable. The overall aim of planning and pollution control policy is to ensure sustainable and beneficial use of land. Polluting activities that are necessary for society and the economy should be sited and planned and subject to planning conditions so that their adverse effects are minimised and contained within acceptable limits.

Existing waste management sites and future/potential waste management sites identified on local plans, that could be adversely affected by proposed plans **and new**

planning applications for non-waste related development, and prejudicial to the implementation of the waste strategy, could be refused.

Regional Spatial Strategy

It is a statutory requirement for the regions to produce a Regional Spatial Strategy (RSS). This strategy should include a concise strategy for waste management which should be a key component of the RSS and formulated in conjunction with other spatial concerns.

Regional planning bodies have been directed to work alongside their constituent planning authorities to produce a *"realistic and responsible approach to future waste management."* They should extract refine and include at regional level policies from local planning strategies that comply with PPS10 and take account of:

- any waste management requirement **identified nationally**
- waste arisings across the region
- municipal waste management strategies
- *the likely demand for capacity arising from **neighbouring regions** and where relevant, **Wales** and **Scotland**, where meeting this demand would be consistent with the policies in PPS10*
- the accommodation of new/expanded waste management facilities

Regional Technical Advisory Bodies (RTAB) will advise the region on waste planning and offer technical advice on policy implementation for the RSS.

Regional Planning Guidance (RPG12)

RPG's provide regional strategic planning guidance. RPG12 aims to gain community support and involvement to help achieve sustainable waste management, reduce waste production and increase reuse, recycling and composting, manage residual waste in a sustainable way, provide technical support and advice. The Planning and Compulsory Purchase Act 2004 introduced a new regime for policy planning. The RPGs are replaced by Regional Spatial Strategies (RSS). The RSS includes land use planning elements associated with waste planning which local authorities must take account of when developing their Development Plans. The new RSS waste content is currently under review (2005).

A selective review of RPG12 (2001) was presented in the RSS for Yorkshire and the Humber (December 2004). The RSS contains policies for prioritising initiatives and facilities to encourage and promote waste reduction and reuse, and provides the recycling and composting targets for the region under the EU Landfill Directive. This RSS will be replaced by a "new" RSS with the draft consultation report being published in January 2006.

Calderdale Unitary Development Plan (UDP)

The Calderdale Unitary Development Plan is currently being revised and the Replacement Unitary Development Plan will now provide for the Boroughs needs up to

2014. The Plan includes a section on waste management, which sets out the strategy for the provision of facilities for waste in accordance with current EU Directives, national legislation, and regional guidance on waste. The Inspectors report on the objections to the Replacement Unitary Development Plan is expected in early 2006 and it is anticipated that the Plan will be adopted mid 2006. The Government places high priority on the management of waste and as a result of the Planning and Compulsory Act 2004, waste local plans and waste policies contained in unitary development plans are replaced by waste Development Frameworks, which over time rely to a greater degree on regional waste management strategies for their strategic input. In this instance the Yorkshire and Humber Region Waste Management Strategy. Work on the waste development document will commence in April 2006.
See footnotes and refer back page 27.

Thus through Planning Policy Statements notes, European and National objectives are reflected in local waste policy and will influence decision making by local planning authorities. PPS23 (Planning and Pollution Control) and PPS 10 (Planning for Sustainable Waste Management) are key planning policy documents pertinent to waste matters in this context.

2.5 Recycling Markets

Listed in Appendix 1 are the current (2005) recycling markets used by FOCSA Services our contractor in placing material to merchants. As can be seen, markets vary for products from local, sub-regional to national.

It is desirable that recyclates are subject to the proximity principle, having local outlets and local job creation where possible. However it has to be recognised for reasons of economy and efficiency that some processing will take place in the wider region and nationally, with further onward shipments (trading) on an international scale. Markets remain under developed in the region, and in response, Recycling Action Yorkshire (RAY) was set up in 2005 to encourage the collection, processing, manufacturing and procurement of recyclable material within the region. RAY has limited finance and therefore functions as a research arm and facillitator for the region, being a catalyst for action, rather than a project management company or initial financial “pump priming” organisation.

2.6 Current Waste Strategy

Following the Best Value Inspections, the development of the Council’s waste strategy has been via and through a series of committee reports, which have both highlighted actions taken/achieved, and sought approval to the next incremental steps.

The committee reports comprising the current Waste Strategy are listed in chronological order below.

1. Report to Cabinet

   Interim Waste Strategy – February 2001

2. Report to Cabinet

   Waste Management Strategy -17 June 2002 Min. B17/27

3. Report to H & S Scrutiny Panel

   Waste Management Action Plan – 1 September 2004 Min.B202/24 1(a)

4. Report to Cabinet to approve a review of Waste Management Strategy

   Waste Management Strategy – 18 July 2005 Min. B24/45

The Council's current strategy can be summarised as follows:

a. initially continue with cost effective and guaranteed but reducing end disposal to landfill via contracts with the private sector until April 1st 2009; supplying the contract guaranteed minimum accumulative tonnage by that date, to the primary landfill contract[29] which eventually expires on 31st July 2013. Retain the secondary contracts until expiry on the 31st July 2008, and seek to renegotiate these operationally necessary[30] backup contracts until 31st July 2013.

   Beginning no later than April 1st 2009 (or sooner) to seek to divert a sufficient MW tonnage away from landfill. Thus eliminating our estimated excess LATS tonnage's (and therefore LATS fines costs) to below the decreasing step value thresh hold for that year and each subsequent decreasing step value, year on year up to 2020.

   The retention of at least one landfill contract will give the Authority the **flexibility needed over this transitional time** to implement, the successor to landfill prior to the first EU Landfill Directive target year in 2010;

b. maintain the existing infrastructure (including all relevant permissions) needed to service these contracts, and seek to implement via a new collection contract starting on 1st August 2008, all the necessary infrastructure, including contract changes, legal changes, possible joint working models, and diversion method(s);

c. continue to identify and successfully bid for relevant external funding to achieve inward investment in technical studies, management studies and recycling/composting services;

d. actions to reduce the quantity of municipal wastes and the amount sent for landfill disposal in order to satisfy Landfill Allowance Targets (LATS) from 2005-2010 and beyond, with targeted and increased emphasis on waste minimisation;

e. continue to develop recycling/composting performance in the short/medium term by:

[29] This contract will still be needed. All diversion (with the possible exception of EfW) methods will require some significant landfill back up for processing residues or process outputs market failures, albeit at reduced tonnages.
[30] Ditto.

- developing and maintaining an extensive waste awareness campaign to all sections of the community, by utilising various funding streams, the Calderdale Waste Partnership, working with the local media and contractors;
- acting on the Household Recycling Design & Management Study 2005 to increase recyclate output from the sites;
- new capital investment to improve household waste recycling centres to boost recycling rate to at least 50%;
- possible resiting of at least one HWRS
- maintenance of the existing bring sites with the Borough;
- develop further partnership working with community groups/social enterprises involved in recycling;
- implement alternative kerbside collections schemes for hard to reach properties;
- linking with the Household Waste Recycling Sites Design & Management Study investigate methods to capture more organic wastes for composting;
- continue via the Rewards for Schools Scheme and other initiatives to promote waste issues in schools.

f. seek to procure, from the private sector, long term waste treatment and disposal which will succeed landfill as the primary waste treatment/disposal options, taking account of targets placed upon the Council for municipal wastes, including Waste Strategy 2000 and EU Landfill Directive.

3.0 NEED FOR CHANGE

The need for a change in the way that waste is dealt with in the Borough of Calderdale arises principally from legislation demanding a more sustainable approach to waste management. The following section on key legislative drivers, examines some of the primary drivers requiring changes in waste management in the Borough, the list is not exhaustive. Key current legislation aimed at improving sustainability is the new LATS legislation and the pre existing Landfill Tax. In addition there is the Landfill Regulations 2002 as amended, which require that by 30th October 2007 all non hazardous waste sent to landfill shall be pre treated.

3.1 Key Policy Documents, Legislative Drivers, Principles & Procedures

Waste Strategy 2000

The UK Government's response to the EU Landfill Directive is the Waste Strategy 2000 (WS2000). The main objective of WS2000 is to divert waste away from landfill in favour of more sustainable waste management options that conform with what is known as the waste hierarchy[31]. Waste Strategy 2000s approach is to set two main types of targets aimed at municipal waste for local authorities to achieve. The targets for local authorities are:

- Reducing the amount of biodegradable municipal waste (bmw) disposed of to landfill in line with EU Landfill Directive; and
- Recovering value from the bmw, with specific targets for recycling and composting, and the need to extract energy via some form of thermal conversion.

WS2000 advocates a number of principles and tools to assist in the decision making process aimed at achieving the desired outcomes. These are defined and listed below.

Sustainability

"development that meets the needs of the present, without preventing future generations from meeting their own needs".

Best Practicable Environmental Option (BPEO)

"the outcome of a systematic procedure which emphasises the protection and conservation of the environment across land, sea, air and water. The BPEO procedure establishes for a given set of principles, the option that provides the benefits of least damage to the environment as a whole at an acceptable cost, in the long term as well as the short term".

[31] See graphic on the next page 34.

The BPEO process should be used when considering the relative merits of various waste management options. The process also ensures that local, environmental, social and economic issues will be important in any decision.

BPEO process was a well-established and powerful decision-making tool that has now been superseded by Sustainability Appraisals (SA) and Strategic Environmental Assessments (SEA). Calderdale Council had already carried out its own BPEO prior to the change to the SA and SEA procedure.

Proximity Principle

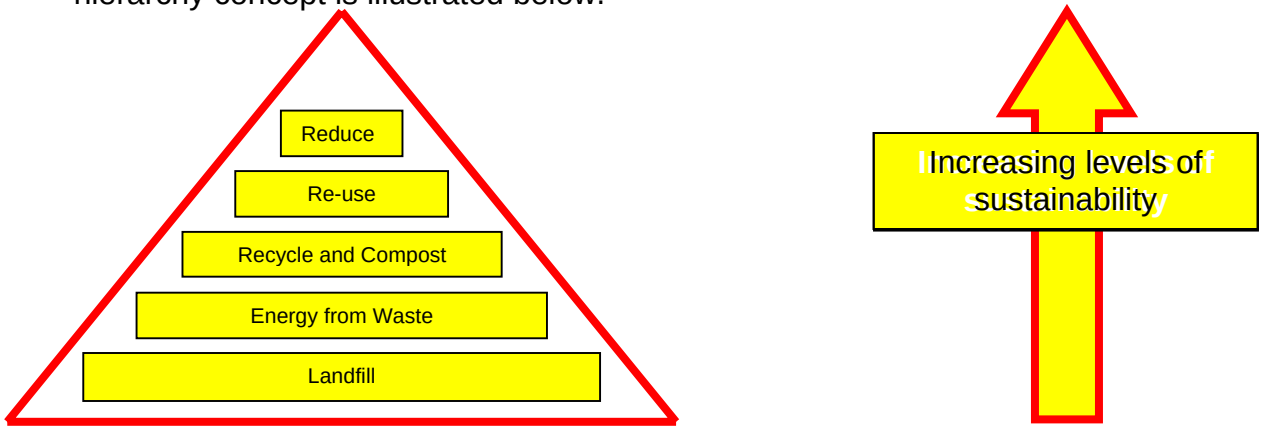
Requires that wastes should be disposed of as close as possible to the place of production. The Proximity Principle should also be used to reduce the actual amount of road or rail transport required and try to transfer any transport required to other less environmental damaging modes for example transport by canal. It is important to note that the Proximity Principle does not necessarily exclude the transport of waste to another location. Indeed recent planning guidance already alluded to encourages a flexible but sustainable management of wastes sometimes across national borders. This principle can be taken into account in BPEO assessments.

Regional Self-Sufficiency

Waste should ideally be treated and/or disposed of where it arises. It therefore follows that there is an expectation that authorities within each region will provide sufficient treatment and or disposal facilities for this to be the case. However it is recognised that as result of the new SA and SEA process certain highly specialised wastes would be better exported from their place of origin to specialised treatment facilities elsewhere.

The Waste Hierarchy

The Waste Hierarchy framework acts as an overarching guide when using the SA, SEA and BPEO process, and is founded on the concept that the higher up the chosen "disposal" method is, in the hierarchical structure or framework, the more sustainable the method of managing the municipal waste becomes. Therefore all waste management activities should be aimed at moving waste disposal methods and management up the hierarchy, taking account of costs and benefits. The waste hierarchy concept is illustrated below.



Reduce – the topmost level in the hierarchy makes the reduction of waste generation in the first place, the highest priority. For example by reducing the product packaging to the minimum level commensurate with protecting the product from damage prior to sale. This level is the one which local authorities are least able to influence effectively at a national level. However the Government are trying to address this issue by providing local authorities with extra funding under the Waste Efficiency Performance Grants system to enable local councils to support such local projects as the Change Project in Calderdale. This project aims to encourage local families to use reusable nappies rather than the disposable variety, a considerable burden on the waste management service. The consultation document on the Review of England's Waste Strategy[32] outlines further national proposals to enhance this tier of the waste hierarchy. It proposes:

- prioritising products for where waste impacts need to be tackled;
- extending product stewardship by producers and reducing impacts through eco-design;
- promoting re-use and remanufacture with support from the BREW programme;
- further engaging business (particularly SMEs) to stimulate resource efficiency through advice services;
- advice to the public on environmental impacts of products.

Re-use - where reduction is not feasible, placing products back into use so that they do not enter the waste stream for example glass milk bottles used for doorstep deliveries of fresh milk.

Recycle and Compost - where re-use is not sensible because a product is obsolete, the capture and reprocessing of certain sorted product materials, to be remade into new materials for the manufacture of new products. In the case of organic materials to be biologically transformed to make a high quality[33] organic compost for use on land.

Recovery - where recycling/composting is not feasible, extracting value in the form of energy recovery should be undertaken, usually requiring some kind of thermal conversion. This could be energy from waste, gasification, or pyrolysis.

Landfill - landfill as a direct end disposal method is only appropriate if none of the foregoing higher options are feasible as it represents the bottom of the hierarchy. Even if methods of disposal higher up the hierarchy are used, there will inevitably be some waste fractions and residues from the higher level waste processing, for which landfill disposal remains the only realistic option.

The WS2000 makes it clear that it does not expect incineration with energy recovery to be considered before recycling and composting have been fully explored.

[32] Defra February 2006.
[33] A high quality compost would need meet the PAS 100 standard to be useable on agricultural land.

Landfill Tax

Since 1996 the Government has used fiscal measures to try to reduce the amount of waste, being disposed of by landfill. This is being attempted by levying a tax on each tonne of MW sent to landfill, thus making landfill a more expensive option for local authorities. Thereby discouraging landfill as a disposal option in favour of more sustainable methods.

This fiscal measure, the Landfill Tax Escalator, for active wastes started at £7 per tonne in 1996, in 2005 this has reached £18 per tonne, and this tax is expected to reach £35 per tonne by 2010/11. The rate of £2 per tonne for inert wastes has remained constant throughout. The tax rates per tonne will be reviewed in 2007, and may go up beyond the current rates quoted.

This tax will increasingly encourage more sustainable options for waste and diversion away from landfill. However for local authorities the chief difficulty is that, until such time as real, robust, reasonably risk free and dependable waste treatment alternatives emerge, (which can successfully cater for the large volumes of municipal wastes), continued disposal to landfill will present in the shorter term significant increases in costs of the waste management service.

Landfill Allowance Trading Scheme (LATS)

In response to the requirements of the EU Landfill Directive, the UK Government has set the following overall mandatory reduction targets for the UK as a whole.

- By 2010 to reduce biodegradable municipal wastes landfilled to 75% of that in 1995.
- By 2013 to reduce biodegradable municipal wastes landfilled to 50% of that in 1995.
- By 2020 to reduce biodegradable municipal wastes landfilled to 35% of that in 1995.

Biodegradable Municipal Wastes (BMW) are managed and controlled locally by local authorities such as Calderdale. Central Government must ensure that local Council's comply with the EU Landfill Directive requirements to achieve national compliance with this directive. To achieve this national compliance, the Government has introduced the Landfill Allowance Trading Scheme, as detailed in its final form in the Waste and Emissions Trading Act 2003.

For the purposes of LATS the Government has calculated that in England municipal waste is 68% biodegradable. It has allocated each local authority an annual landfill allowance (up to 2020), based on a historical tonnage and recycling profile which should ensure that the UK as a nation will meet the EU Landfill Directive targets, thus avoiding the imposition of fines on the UK Government for failure to meet the landfill targets.

Although the first Landfill Directive target year is in 2010, the Government, has introduced LATS from April 1st 2005 with an incremental reduction in allowances until 2010. The incremental or step wise reduction will lead most authorities into a deficit resulting in fines by 2009/10 unless diversion from landfill is successfully achieved.

It was recognised that local authorities with existing energy from waste plants or incinerators would not need all of their allowances. Whilst others who have relied on a mixture of landfill and recycling, and are still developing their longer-term strategies, will have a shortfall of LATS allowances and need to augment their allowances. In such cases landfill allowance trading will take place between Councils in the form of traded permits. This should help to mitigate the huge costs that would otherwise fall on local authorities, but traded permits will increase the costs of landfill for those authorities that have to purchase additional permits.

Local authorities landfilling quantities beyond that permitted by the allowances they hold or traded tonnages they have bought, will be fined. The fine currently set at £150 per tonne for each tonne landfilled beyond the allowance limit or traded tonnages bought.

All allowances allocated are based on local authority waste returns to Government for the year 2001/2, and take no account of any waste growth or the fact that wastes data of that era is less than satisfactory. Nationally waste has been growing at around 2-3% which will require an increase in landfill diversion as the years go by. Calderdale is no exception, with difficult years beginning in 2009 onwards.

There are further significant step changes down in 2013 and 2020, and these landfill reduction targets will need to be taken account of in the long term waste strategy development. This is further discussed below.

Recovering Value from Municipal Wastes

Waste Strategy 2000 has set some very clear targets for recycling, composting and energy recovery from municipal wastes. A summary of the targets is set out below, and will over time present a considerable and demanding challenge to all local authorities.

a) Recycling/Composting Targets for Household Waste

- To recycle or compost at least 25% of household waste by 2005.
- To recycle or compost at least 30% of household waste by 2010.
- To recycle or compost at least 33% of household waste by 2015.

b) Recovery Targets for Municipal Waste

- To recover value from 40% of municipal waste by 2005.
- To recover value from 45% of municipal waste by 2010.
- To recover value from 67% of municipal waste by 2015.

Notes:

1) Household waste is waste produced from domestic sources (including HWRS). Municipal waste includes household waste together with council collected commercial waste. Calderdale has opted not to collect commercial waste.

2) Recovery can mean a combination of recycling, composting, or some other form of energy extraction in order to derive some additional value from the waste. Thus by carrying out these processes either singly or in combination using household waste as the feedstock local authorities can achieve their overall recovery target for municipal wastes.

   It follows that achieving the recovery targets will, in diverting wastes away from landfill, assist in meeting the landfill diversion targets and LATS obligations noted earlier.

   The recycling/composting targets are mandatory, with each region, sub region and constituent local authority being set individual targets, based on previous performance.

   The West Yorkshire sub-region target for 2005 is 21%. Calderdale's individual 2005/06 Statutory Target is 18%, Bradford's is 24% only exceeded in the Yorkshire and Humber Region by East Riding and Craven at 27%, and Ryedale at 33%.

Summary

It will not be possible to achieve the landfill reduction and recovery targets with Calderdale's present recycling/composting operations, (in 2004/5 Calderdale achieved a combined recycling/composting rate of 17.05% of household waste). Therefore some form of further extraction, treatment and or energy recovery will be required both in the short term and longer term, and will be the major objective of the any future procurement exercises.

3.2 Other Legislative Drivers

Listed below are some other items of legislation, which need to be considered in the development of this Strategy: It should be noted that this list is not exhaustive.

Landfill Regulations as Amended 2005

The landfill regulations are being constantly updated to suite changing requirements from the EU. Currently the UK Government have adopted a position that it requires that all wastes that are disposed of to landfill shall be pre treated prior to landfill after the 30th October 2007. The difficulty here is the interpretation of the word pre treatment, and what actually constitutes pre treatment. DEFRA guidance has just been issued (25th November 2005) on this and other matters related to landfill, however the guidance states that further clarification will be given as to the definition of pre treatment once discussions with the Environment Agency have been

concluded. In the meantime the UK Courts will ultimately have to be the final arbiter on this matter.

This issue is important for local authorities, as any new disposal method that is chosen, will not only have to deal with the diversion of sufficient tonnages of waste away from landfill; but will have to be certain of being classed as a pre-treatment process as well. This is because any inevitable process residues or any temporarily un-saleable products[34] may have to be land filled as a home of last resort.

Environmental Protection Act 1990 (EPA)

The EPA is the primary legislation for dealing with all aspects of the waste management, including waste treatment and disposal, collection and cleansing. In addition the Act deals with pollution control, dumping, statutory nuisance and Duty of Care, which all, in their own right, will have some impact upon waste management strategy, and future procurement.

Local Government Act 2000

The Local Government Act 2000 gives local authorities the power to promote or improve economic, social or environmental well being. The Act requires that authorities have regard to their community strategy in exercising this power. The power is expected to encourage a local contribution to national priorities and enable innovative and imaginary approaches to include sustainable development, tackling social exclusion, reducing health inequalities, promoting neighbourhood renewal and improving local environmental quality.

End of Life Vehicles (ELVs) Directive 2000/53/EC

ELVs will require treatment by authorised dismantlers and shredders. This Directive will affect the disposal of ELVs and is likely to increase the level of abandoned vehicles, and the costs incurred by the Council in dealing with them. Costs to the Council increased because ELV have become hazardous waste due to fluids such as oil and acid they contain.

Household Waste Recycling Act 2003

Requires that, by 2010 local authorities collect at least two recyclates at the kerbside separate from the remainder of the waste. Calderdale currently complies with this requirement.

Waste Electrical and Electronic Equipment (WEEE)

The Directive requires producers of electrical and electronic goods to recycle them. The implementation date has been put back to mid 2006.

[34] Because of fluctuating market conditions.

Initially it was the Government's intention that most WEEE would be dealt with by producer responsibility through retailer take back schemes. It is more likely that the bulk of this burden will fall on Local Authorities, and the HWRS playing a much more significant role than the Directive envisaged. Some WEEE will become hazardous wastes, with a ban on the land filling of Cathode Ray Tubes (from TV's and monitors) already so designated.

Apart from the quite separate collections of fridges, Calderdale currently does not separately collect WEEE (and therefore recycle it) as part of its separate Bulky Household Collection Service. However all 5 HWRS now have containers for a wide range of WEEE goods.

The Directive has set a recovery target for WEEE of at least 4kg per person per year (almost 773 tonnes per annum in Calderdale's case). From the recent waste analysis it would appear that residents of Calderdale have something like 600[35] tonnes p.a. to dispose of giving 3.1 kg/ppy slightly below the government target of 4kg/pppy, however if one adds in the WEEE taken directly to HWRS the figure will exceed the 4kg/pppy at 7.24kg/ppy.

Closely connected to WEEE is the Batteries Directive, which will require separate collection and recycling of all batteries and lead acid accumulators across the EU, harmonising very different schemes across the Continent. This is likely to result in the Council having to provide separate collection facilities for batteries, most likely sited at HWRS, and possibly some Bring Sites and supermarkets. The Directive aims at:

- a partial ban (medical equipment batteries are excluded) on nickel-cadmium,
- a collection target of 25% of average annual sales 4 years after the Directive is implemented in the UK, rising to 45% after 8 years
- a ban on the disposal of automotive and industrial batteries to landfill

This directive will be adopted by the UK Government by the middle of 2006.

New Hazardous Waste Regulations

Effective from July 2005, these replace the previous Special Waste Regulations, which were last reviewed in 1996. The new Regulations alter the procedures for consigning hazardous wastes (formerly known as Special Wastes), but also significantly increase the items now classed as hazardous, in line with the European Waste Catalogue, and includes a number of routine household wastes as previously noted under WEEE, and ELV above. This legislation clearly has an operational and administrative cost for local authorities in how they consign and manage this waste.

[35] Assuming a population of 193,200.

Waste Minimisation Act 1998

This Act has given powers to local authorities to introduce measures promoting waste minimisation; e.g., they can subsidise a nappy washing service, and provide information on how households can reduce the amount of junk mail[36] that they receive. Waste minimisation efforts can therefore be considered from two perspectives:

- minimising the *input* to a household or business through use of purchasing power;
- minimising the *output* from a household or business from internal reuse or composting.

The Animal By-Products Regulations 2005

These Regulations require catering wastes that are sent for processing to be treated to defined process standards, ensuring that all pathogens are reduced to an acceptable level. The principal issue for the waste industry is that waste from commercial kitchens (such as restaurants), or waste that has been in contact with kitchen waste, is classed as catering waste. If processed by composting or digestion, these wastes will have to be processed to stringent conditions in an enclosed (in-vessel) environment. The main operational constraints for the processing is the need to:

- segregate the input wastes from the product of the process,
- ensure that high process temperatures are achieved for the required time,
- totally enclose the process
- require that the process has two stages of sanitation.

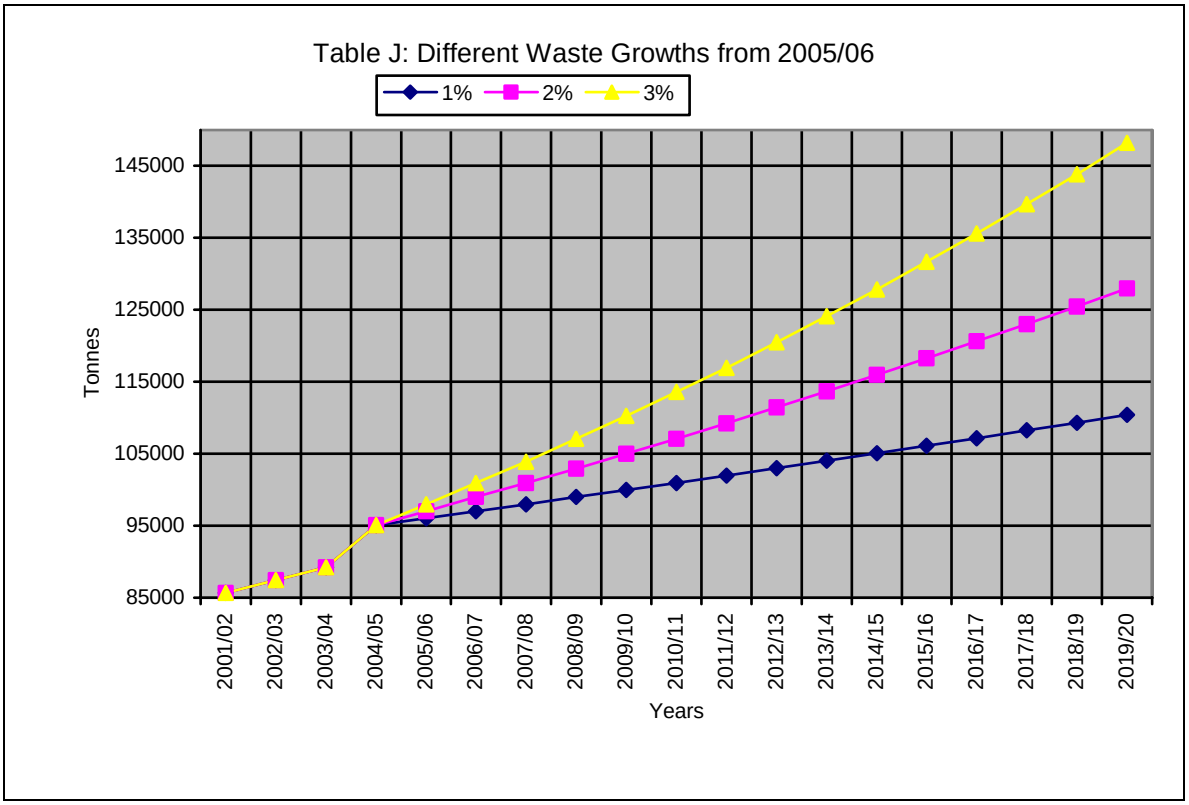
The full implication for local authorities is still being digested, but could be significant, particularly where a Council's municipal waste contains trade waste material arising from food businesses covered by the Regulations.

3.3 Waste Growth Projections

The quantities of municipal wastes now managed by the Council, is estimated[37] to have increased steadily for 35 years in line with national average increases of between 2-3%. The data available has improved since April 1st 1998 when Calderdale took control[38] of waste management operations in the Borough. The main reason for this being administrative as Calderdale, from then onwards collated figures for the Borough only. Prior to the above date figures for the origins of tonnages were kept on a county basis rather than a local authority basis. This means that Calderdale has valid but initially fluctuating data for the last 7 years.

[36] Advice has been given by CMBC on this issue.
[37] An local area report of the 1970's gave tonnage totals for Todmorden, Hebden Royd, Sowerby Bridge, Halifax, Brighouse.
[38] See pages 9 & 10 for the historical background to changes of control.

Table J[39] shows waste growths from 2004/05 projected in the Borough at 1%, 2% and 3%. A report to the Council in early 2005 assumed an annual growth rate of 3% up to year 2020, the final EU Landfill Directive target year. However any long term contract secured for waste treatment services to succeed landfill, is likely to extend significantly beyond 2020 say up to 2030.



The implications of the waste growth at a nominal 3%[40], and the potential risks over time to the Council in respect of LATS fines, and how this influences future procurement strategy, are discussed in Section 8. Measures to slow down the rate of growth are essential and must be considered, and implemented where they are cost effective. However the Waste Strategy will need to be **flexible** to accommodate the growth in both recycling and residual waste treatment, and unexpected changes in waste growth both upward and downward, together with the still emerging new waste treatment technologies.

3.4 Gap Analysis

As can be seen in Table J, taking the middle range of 2% annual growth the overall MSW for Calderdale is estimated to grow from around 95,000 tonnes p.a. in 2005 to over 128,000 tonnes p.a. by 2020.

[39] Commercial waste tonnages for 2001/02 & 2002/03 have been deducted to give standardised waste growth figures, and better show real domestic waste growth.
[40] The generally accepted figure for Local Authority waste growth is 3%.

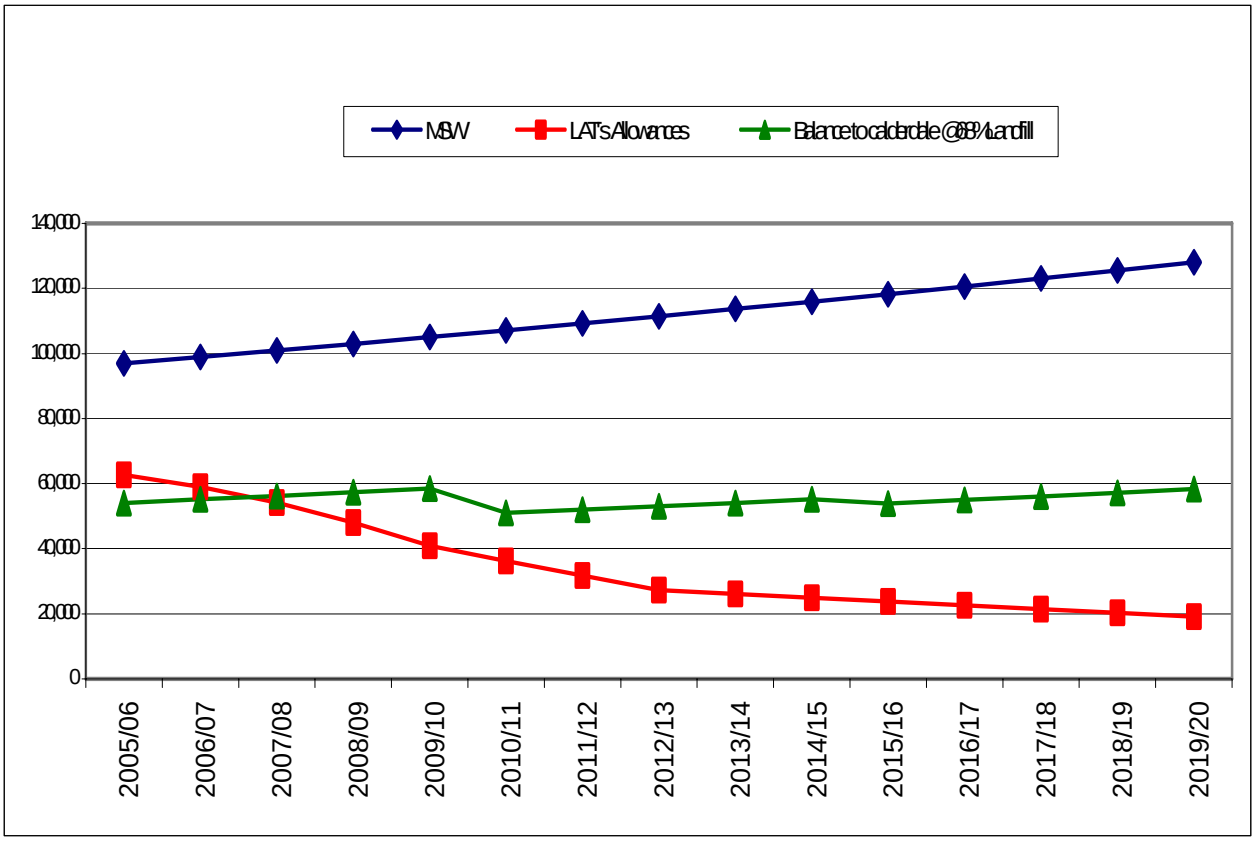
The Council is faced with:

a) an increasing production of household waste at 1-3% per year;
b) a steadily increasing recycling rate, but the rate is likely to peak at about 25% without further intervention; 30% between 2010/11 – 2014/15 and 33% thereafter is hoped for,
c) a reducing landfill allowance which will restrict the amount of biodegradable waste that is permitted to be sent to landfill.

This will result in the development of a gap between the amount of waste handled by the Council compared with that which can be landfilled. Table K shows the picture graphically. From 2020 the amount of mixed waste permitted to landfill will be 19,039 tonnes net or allowing for the 68% biodegradability 27,999 tonnes gross.

Given a mid range of 2% annual growth in Calderdale's household waste, the Council will have spent all its LATS allowances by April 1st 2009, net of recycling activity. With about 18,000 tonnes per annum of waste requiring diversion from landfill to some other form of waste treatment process during 2009/10. This supposes the recycling rate is around 18%, if it were higher at the aspirational 30% for that year then the diversion tonnage would be about 13,900 tonnes for that year. Assuming the alternative waste disposal process selected, itself produces a 20% residue to landfill, then a gross waste treatment input of approximately 22,500 tonnes per annum will be needed in 2009/10. That is 22,500 x 0.2 = 4,500, and 22,500 – 4,500 = 18,000 t.p.a. the minimum of bio waste that must be diverted in 2009/10.

Table K: Gap Analysis 2% Annual Growth in Waste



Although it is possible to purchase allowances from other local authorities in order to landfill beyond allowance allocation, LATS are likely to become increasingly scarce and expensive as target years approach, although they may fall considerably, close to the target year deadline. Alternatively local authorities can bank or borrow allowances against future performances, though this will not be allowed to carry over settlement years (e.g. 2010 is a settlement year), or in the year prior to a settlement year.

The sanctions for landfilling beyond allowances held is currently a fine imposed on the Council at a rate of £150 for every tonne exceeding the allowances. If Calderdale landfilled just 10,000 tonnes in any one accounting year beyond its allowances, it would result in a fine of £1.5m. **The gap in Table K** gives an **indication only** of the growing problem for the Authority. A more sophisticated graphical and spreadsheet analysis shows that fines for failure to divert about 16,000 tonnes[41] in 2009/10 could cost the authority a £2.4m fine.

[41] Overshoot tonnages at 2% growth depends on recycling performance. At 18% recycling, tonnage about 17,700 tonnes over the LATS limit, at 30% recycling about 13,900 tonnes over the LATS tonnage allowance.

If by 2020 Calderdale has done nothing the Authority will have paid fines totalling about £46.5M[42], that is an average fine of £3m per year.

It is clear from this that the future waste strategy and long term procurement must address this gap, and must, over the life of any procured contract, be capable of treating and diverting increasing and significant tonnages of BMW away from landfill up to 2020 limits and beyond. For example in 2019/20 Calderdale will have to divert a minimum of 40,000 tonnes per annum BMW away from landfill. Assuming an 80% efficiency for the diversion process this means in reality 50,000 t.p.a. will have to be processed by that time allowing no margin of error in terms of plant downtime. The acquisition of modular processing units over time would lend itself to the increasing tonnage's situation portrayed.

The financial risks to the Council of not achieving the landfill allowance targets are significant. Doing nothing is not a financially viable option. It can also be concluded with some certainty that costs of waste management will increase significantly over 2005 levels, whether it is paying the cost of landfill (including increasing levels of landfill tax, purchasing landfill allowances, or the possible payment of LATS fines) or investing in alternatives to landfill. This situation can be best summarised by an extract from the report of the Head of Environmental Health 18th July 2005.

"*6.1 The costs associated with the review of the Strategy will be contained within existing budgets. The implications of procuring alternative disposal arrangements will be very significant, possibly in the order of three times the existing annual disposal cost of £ 2.5 million. The present cost of landfill will rise by £3 per tonne per year as a result of increases in Landfill Tax and has risen this year because of more stringent environmental controls on landfill operations. Failure to divert the required tonnages of waste from landfill would incur penalty costs for the year 2009/10, payable in 2010/11 of £1,716,000 and increasing onwards each year throughout the LAT scheme, these penalties being payable in addition to the disposal cost."*

And again

"6.3 The present collection contract costs £4.5 millions per year. To increase the recycling rate from the present 18% requirement to 25% within the period of this contract will cost an additional £483,180 in 2007/8. This increase will be required to delay the impact of LATS to 2009. A replacement contract with requirements for higher levels of recycling and more varied and complex collection methods will be more expensive, but every tonne of waste recycled is one less tonne incurring disposal costs and possibly penalties."

3.5 <u>Waste Collection</u>

This section on the need for change began with the view that *"The need for change in the way that waste is dealt with in Calderdale arises principally from legislation demanding a more sustainable approach to waste management."* Waste collection is

[42] Assuming 2% annual growth in MW, with initially 18%, then 30%, and finally 33% recycling at different stages, fine @ £150 p.t.

a key first stage process both technically and from a service provision point of view. This is because the gap analysis has shown that a considerable volume of waste must be dealt with by alternative methods to landfill that must involve extracting yet more recyclate from the collected waste.

The Legislation Underpinning the Local Authority Waste Collection Service
The Environmental Protection Act (EPA) 1990 Sections 45 and 46 contain most of the legislation pertinent to waste collection.

Section 45 lays a duty on a Waste Collection Authority (WCA) to collect household waste in its area **at no charge** except for waste, which is non household or inaccessible so that the cost of collecting it would be unreasonably high. The WCA may if it wishes levy a legal charge for collecting the following items of waste:

- builders waste;
- DIY waste;
- fixtures and fittings;
- garden waste;
- bulky household waste;
- fridges and freezers

Section 46 concerns the provision, use, and placement of receptacles for household waste. This section gives a local authority some scope to remodel the collection service, so that a larger amount of household waste can be separated out for recycling. Powers available include:

- A requirement for the householder to place waste for collection in receptacles of a kind and number specified that is reasonable.
- The receptacles may be provided free of charge by the local authority, or by the householder
- The specifying of the size, construction and maintenance
- The placement on highways of the receptacles ready for collection.
- The substance or articles that may be placed in a receptacle
- The steps to be taken by occupiers of premises to facilitate the collection of waste from the receptacles
- Power of enforcement.

The crux of the argument about the organisation of household waste collection is how to organise the collection system so that the maximum amount of recyclate is extracted at the minimum cost, whilst still maintaining high standards of service provision. Local authorities, dictated to by local conditions and the thrust of directed local political leadership, use a wide variety of methods. The present state and longevity of legislation (EPA 1990 Sections 45 and 46) that controls local authority household waste collection systems, does not presently or particularly encourage or enable the achievement of maximum recyclate extraction from household waste. Except that creative use of Section 46 can help to increase indirectly the quantity of recyclate “donated” by the householder. (Appendices XB/XC for resident donation rates)

Changing waste collection methods play an important part in any waste strategy as a simple and effective way to extract and divert waste away from landfill. Thus reducing the need for expensive processing at a later stage by processes that could be regarded as still being at the development stage both technically and from the legislative standpoint. Whist it is true that advanced MW waste processing is carried out in some continental countries, because of differing needs and local requirement, the United Kingdom is still someway behind the more advanced forms of waste processing. In addition UK legislation is still not fully developed to accommodate new and innovative waste treatment methods. For example as mentioned on page 39, it has still not been fully decided what constitutes “pre treatment” a pre-requisite for all wastes that are sent to landfill after the 31st October 2007.

The type of collection system itself, can positively, or negatively, have an affect the waste processing system that follows on from the collection system. For example changing from a black bag collection system, to a wheeled bin collection system can adversely effect the operation of mechanical treatment plant, sometimes causing major breakdowns.

Collecting waste via a black bag is itself a quality control system for the waste input stream, an important consideration when using mechanical plant to process the waste. The collection crew will immediately detect any foreign bodies such as metal car cylinder heads at the point of collection.

Extensive kerbside collections of various separate waste streams can also have “knock on” effects on the processing arrangements made later on downstream. Effects may be of a relatively minor kind, such as the redundancy of a ferrous and non ferrous metal separation equipment on the processing line, if aluminium and steel cans are segregated at the kerbside collection point. More serious effects can result in plants not working up to specification or failing to work at all. Thus reconfiguration of a collection system must take into consideration the waste processing system that is to follow.

Ideally any changes to a collection system must be undertaken when the main waste processing system that will be used later, is known. Under the present circumstances (imminence of LATS etc.) it is difficult to see how an integrated decision making process such as this can be used. Especially when the emphasis must be to reduce quickly waste going to landfill, using simple means via the collection system, until such time as modern well integrated waste management plant can be built, under fixed and well understood UK legislation.

Even waste minimisation becomes an issue when considering collection systems and their reorganisation. One of the best ways for a local authority to minimise the household waste collected is to use the black bag system, as the strength and size of the bag, limits the weight of household waste that can be collected from each house. The introduction of strong and rigid wheeled bins tends to put up the quantities of waste collected up, as they will easily contain a greater weight of household waste per collection.

Also from the service provision aspect, change in collection procedures is more likely to cause controversy or householder dissatisfaction, than any other aspect of the waste management process. There is thus reluctance on the part of all stakeholders, residents, Councillors, and officers of the Council to change from an established and well-understood system to one of relatively unknown outcomes and difficulty.

Yet beneficial change in the collection arrangements can make a large contribution to the recycling performance of an authority and reduce the quantities of waste going to landfill. Under the prevailing circumstances, (lagging legislation and technical uncertainty) changes to the collection system along with increased recycling at the HWRS and bring sites must be an item high on the Waste Strategy agenda.

Such changes will raise the cost of collection that goes with the existing basic, simple, and traditional service. The collection of further waste streams, the equipping vehicles to carry segregated wastes, and the provision of further waste receptacles which could be at Council expense, will add to the cost of collection.

Calderdale's present collection method is a "back door black bag" for residual waste. This method has been traditionally used in the Borough for many years because of the topography of the Borough and the dense terrace housing in some parts of the Borough. The road safety and visual amenity aspects have also led to the retention of the "black bag" collection method to the present day. The fortnightly collection of glass and waste paper has recently been introduced.

The health and safety aspects of refuse vehicles crews working environment and possible injury due to repetitive lifting is an issue of increasing importance for local authorities and private waste disposal companies. Also the hygiene issues raised by using black bags of limited strength compared with rigid plastic wheeled bins, and stick injuries and cuts from broken glass projecting through the bag. If wheeled bins are used then manual handling and lifting safety hazards can be reduced to a minimum, thus improving and providing a safer working environment of the collection crews. Changing to wheeled bins has been considered in the past on the above hygiene and handling grounds but rejected by Councillors on the grounds of siting/storage problems, visual amenity, bin vandalism, road safety, and capital cost.

However since that decision some organic change in the refuse collection service has taken place because of changes in housing development within the Borough. The conversion of old mills to loft living apartments and the provision of more high rise flats has made it necessary to provide large wheeled bins of the "Plaza Grande" type. These bins provide a community disposal point for residential household waste. The bins are emptied into refuse collection vehicles equipped with a bin lifting mechanism.

Since organic change has in fact already occurred and proved that diverse collection systems can co-exist in this Borough, it is therefore possible to move from a virtually monolithic collection system to one which employs more than one type of collection system in terms of receptacles provided. Those housing areas that are suitable should be provided with wheeled bins for residual and recyclate waste; or wheeled bins and boxes and bags, so that the householder can separate recyclate for

collection by the Authority. Those properties deemed not suitable by reason of location or lack of storage space should continue with the present black bag system.

Householders Opinions on Waste Collection

A recent survey via Talkback asked respondents about their views on waste collection and recycling, 48% of respondents claimed to recycle as much as they could and a further 45% would do more recycling than they already do, if it was easier. A significant majority 94% would be prepared to separate waste prior to collection, to aid recycling in the Borough.

Respondents were asked to examine each option in turn and not to exclude any option as the Council wanted to know their opinions on each and every option, and their most and least favoured option from amongst the three offered.

Questions were asked about possible new collection arrangements as follows:

Option 1: Each house would have two or three wheeled bins; one or two for recycled materials and another bin for your household waste.

Option 2: Each house would have one wheeled bin for waste, and a combination of boxes and bags that will enable you to store recyclable materials separately whilst awaiting collection.

Option 3: Black bin bags would be <u>retained</u> for non recyclable waste, together with a combination of boxes and bags that will enable you to store recyclable materials separately whilst awaiting collection

The results are shown in the table below:

Table L - Collection Options Support

Option number	Number of Yes Replies	Yes % Support	Number of No Replies	No %Support
1	416	69	190	31
2	390	65	212	35
3	435	71	179	29

The results show that given the opportunity to comment on the merits of each and every option, every option has supporters roughly **evenly spread amongst the population sample**. However when asked to choose/favour one particular option there was a clear favourite option. The question as asked was:

Q6. Of the three options outlined which are you MOST in favour of?

Table M shows that option 1 was the favourite option by a significant margin of 104% in one case (option 1 over option 2), and 46% (option 1 over option 3).

Option number	Number of replies	% of Support each option
1	275	46
2	135	23
3	189	32

Conversely when asked to pick the least favoured option, again Option 1 is ahead by a narrow majority (12%) with more people disliking Option 3 than Option 1. Option 2 is least disliked but has least positive support when taken as an actual choice by respondents.

Q7. Of the three options outlined which are you LEAST in favour of?

Table N

Option number	Number of replies	% of Support each option
1	260	44
2	37	6
3	297	50

In addition to the issue of the type and number of waste receptacle(s) to be used respondents were asked about their views on placement of the receptacles prior to collection. They were asked if they would be willing to take the receptacles to the edge of their properties, ready for collection later. Of the 606 who responded 412 or 68% would do this, with 194 or 32% being unwilling.

As far as alternate weekly collections are concerned that is one-week residual waste collection, and the other recyclate collection, of the 623 who responded 385 or 62% would support such a measure, with 238 or 38% being opposed.

The above results show that as a first step, the Waste Strategy should seek to reduce residual waste by altering the collection system. It will be possible to collect pre-sorted recyclate at the kerbside and avoid at least initially the need to consider more elaborate systems of waste processing such as a dirty MURF or a MURF attached at the front end to a MBT system.

Extra costs in terms of specialist vehicles and onward recyclate handling can be partially alleviated by using a **kerbside alternate weekly collection** so that the number of collections from each house per year do not increase and the handling costs at the house go down. By utilising the now apparent good will of residents extra clean pre-sorted recyclate such as cans, plastics, and cardboard can be collected in addition to the paper and glass that is already collected on a weekly basis.

A necessary corollary with **an already in place and enhanced collection system including recycling**, would be a more stringent policy on side waste. Side waste, or extra waste placed in some receptacle next to the wheeled bin for collection, has always been a problem, because of the “reasonable” test. A Council in refusing to take side waste must be able to show, and sometimes ultimately in court, that its actions are reasonable if challenged by the resident in question. A test of reasonableness or otherwise in each case, would clearly be decided by the Courts by inquiring as to the additional quantity put out, and any other services the Council provided to remove household waste as a mitigating factor.

As has already been stated, under Section 46 of the EPA 1990 the Council has the power to require the householder to place waste for collection in receptacles of a kind and number specified that is reasonable. By using this section of the legislation in a purposeful and positive way, with extensive waste awareness education, it should be possible to restrict householders to a single receptacle for household waste. If this is done after or at the same time that a new and enhanced kerbside recycling system is introduced, electors’ opposition and refusal to co-operate with the Council should be reduced to a minimum.

If enhanced waste collection systems are in place then the removal of side waste should be discontinued to encourage waste minimisation and reduction.

These results although giving positive encouragement to the possibilities for more extensive extraction of recyclate from the household waste by reconfiguring the collection system, should at this time be treated with caution. This is because Talkback is postal survey selected at random from the Electoral Register and therefore tends to engage with some groups more than others. However the method does give a broad measure of public opinion. Further consultation now in progress (February 2006) via the Household Survey will reveal the full extent of public support for possible changes to the collection system. (See Appendix XA for the April results)

There is clearly at least some public support for an improved and therefore more costly collection system which correctly configured could increase the amounts of recyclate collected, and reduce amounts of waste going to landfill. Savings in landfill charges could go a long way to paying for extra collection costs and have the double benefit of helping to avoid LATs fines at £150 per tonne. By utilising public support and with enhanced waste awareness education it should be possible to reduce significantly the residual waste tonnage via the collection system. The current averaged Set Out Rate and Participation Rate for October 2005 and February/March 2006 of 28% and 40% show quantitatively that public support does exist. (See Appendix XB and XC)

4.0 STRATEGIC DEVELOPMENT

4.1 Aims and Objectives of the Municipal Waste Management Strategy

The overall aims and objectives of this MWMS are to focus on the waste management issues facing the Council to 2020. To determine what actions need to be considered to address and solve these issues, and assess how the issues will influence the procurement of the long term waste treatment and disposal services for the Council's municipal wastes".

The Strategy should also:

- as far as possible elevate the waste management activities up the waste hierarchy to more sustainable levels;
- attempt to achieve self-sufficiency and manage wastes in accordance with the proximity principle;
- contribute to achievement of corporate priorities;
- achieve local and national targets;
- improve public awareness of waste and environmental issues;
- link to other neighbouring Council strategic documents;
- provide value for money.

The objectives of this review are therefore to:

- review where we are today;
- identify where do we want to get to by 2020 and beyond;
- identify what things we need to do to get there;
- consider how we will implement the necessary actions (procurement strategy).

4.2 Links to Spatial Planning

Guidance from DEFRA suggests "that to ensure that the waste strategy is deliverable" it is vital that it both informs and is informed by spatial planning strategies". This is particularly so if the MSWM becomes a Supplementary Planning Document.

Clearly such links between this Strategy and spatial planning will include shared data, community engagement and dialogue programmes etc, and could serve to avoid duplication of effort and reduce areas of conflict.

However the Strategy and any future procurement of waste treatment facilities will depend on the local planning system delivering the sites with appropriate permissions upon which such facilities can be built and operated. The policies and guidance to be used by the planning system are detailed in 2.4 page 26. The achievement of planning approvals within a reasonable time should not be taken for granted, as there are now numerous examples nationally of severe delays being encountered in delivering planning for waste facilities (especially mass-burn and energy from waste plants).

4.3 Establishing the Business Case

This document has thus far:

- Section 1 profiled the Borough and its waste management service;
- commented on Calderdale's present waste composition and operational structure and BV performance;
- reviewed national waste strategy, planning requirements, recycling markets;
- examined briefly the current waste strategy;
- identified the main drivers including policy, fiscal, legal, technical for change in the waste sector;
- identified the likely costs to the Authority in terms of the LATS
- identified likely waste growth projections in tonnage terms
- identified a significant gap between the likely tonnage's for disposal and the landfill allowances given to the Authority;
- established **beyond reasonable doubt** that **change is a necessity**.

As can be seen in Section 2, Calderdale has been developing its present waste policy over time since February 2001. The Cabinet Committee decision on 17th June 2002 later endorsed by Full Council on July 24th 2002 confirmed that the Council should adopt the following Waste Management Strategy to achieve its waste management objectives including:

- Part 1 and Part 2 (a) and (b) of the Interim Waste Management Strategy continue to form the basis of the Council's Waste Management Strategy for the period up to 31st July 2008.
- The Council has begun a process to enable it to make informed judgements on the selection of the BPEO. The process will involve:

Participation in the development of regional waste management strategies

The commencement of a structured public consultation on the matter of BPEO and on the **question of future waste management partnerships.**

- The Council will **carefully monitor developments in the waste management industry** to identify the point at which conditions are **favourable to the establishment of sound partnerships** and **when a range of options from which to select waste processing technologies is available.**

- On the commencement of the Waste Management Services Contract on 1st August 2003, the Council began a process which would ultimately lead to the establishment through negotiated procedures of an Integrated Waste Management arrangement to commence on August 1st 2008.

- The Council will consult the public on the content of this strategy and any issues raised. The Council will use the results of the consultation in the decision making process.

Political approval, in response to establishing a need for change (business case), is therefore clear, accepting that the significant inward investment needed will be achieved by partnering with a long term waste contract with a private waste company either directly or through some form of local or regional partnership. The BPEO is complete with consultations yet to follow.

The technology options, associated land and planning issues and likely funding arrangements are explored in Section 5 with an options appraisal in Section 6 and options selection in Section 7.

The need for a radical change in the way that waste is dealt with is not unique to Calderdale and is faced by many other authorities in the UK. This scenario presents a risk to the Council in terms of **capacity within the major private waste companies to service bids from local authorities.** Companies will have the opportunity to prioritise which local authority contracts to consider and Calderdale will need to be attractive to potential contractors. Calderdale being a small Authority with a low annual tonnage may need to seek partnership options with other adjacent authorities. This is explored below.

4.4 Attracting Contractors to Bid

A number of informed market soundings have been taken in order to understand better the private sector waste market. Such soundings have been taken using our existing waste services contractor and through contractual relationships with our landfill companies; contact with Greater Manchester WDA, meeting other local authorities in West Yorkshire, attending seminars held with waste companies, listening to consultants, as well as legal and financial experts.

The collective view of the industry can be summarised as follows:

- there are only a maximum of 8 major waste companies in the market place;
- out of these **only half** are interested in bidding for an **integrated waste treatment and refuse collection services**;
- all only have the capacity to service between 2-3 bids at any one time;
- all wish to contract long term (minimum 15 year, typically 25 year term);
- all rate having political endorsement and backing for the process as essential;
- all would prefer that the public have “bought into the process”;
- **all rate highly the ability of Council to identify suitable land in the Borough (especially with appropriate permissions) upon which to build facilities (spatial planning);**

- **all** would prefer to contract based upon an **output specification**, rather than narrowly identified technological solutions.

It is clear that there are a number of common threads running through all the major companies which the Council needs to recognise if it is to ensure that it's tender is to be attractive to contractors, and encourage them to bid as part of the procurement exercise.

It has also become clear from the soundings that **bank-ability** is of utmost importance to the waste companies. In order to access the levels of capital sums needed by waste contractors to invest in long term waste treatment facilities, they will need to borrow resources. Financial institutions are cautious by nature and are likely to be interested in waste treatment solutions that can demonstrate a **proven track record**.

The risk to the Council is that this may serve to exclude less environmentally challenging or developing technologies such as pyrolysis, gasification, autoclaving etc., thus leaving a much narrower field of options.

The issues and challenges to bring together the strategy development, procurement, technical solutions and economics into a **credible business case to achieve the investment needed are set out further in Sections 5 onwards.**

4.5 Legal Powers

Any procurement process to achieve waste treatment technologies involving private sector contractors, will involve both in-house, and external legal advisors at a very early stage, and should follow the exercise right through to contract closure. Such involvement both at all levels of detail, will ensure the process is in full compliance with all pertinent legislation.

4.6 Council Decision Making Structures

The Council has 51 members and the present political composition is:
Conservative – 21; Labour – 9; Liberal Democrats –15; British National Party –3; Independent – 3.

The Cabinet "takes decisions in the discharge of the Council's functions, subject to the scrutiny of a number of Scrutiny Panels. The Cabinet is collectively responsible for the decisions it makes and its decision making arrangements are designed to be open, transparent and accountable". The Cabinet is a single party body made up by Members of the Conservative Group.

The Cabinet is charged with the day to day running of the Council and a decision to award a tender for long term waste processing will be taken by this body. That decision will be scrutinised by the Health and Social Care Scrutiny Panel.

In respect of matters of waste management, reference has been made to several Committee reports.

However pertinent to the strategy and procurement process, are the decisions of the Cabinet of (i) 17th June 2002, and (ii) September 1st 2004.

(i) resolved "that it be recommended to the Council that the Waste Management Strategy be approved". (Min. B17/27).

(ii) resolved "that it be recommended to the Council that the Action Plan be approved". (Min. B202/241(a))

The **combined** effect is for the Council to seek to procure the long term waste treatment solution to succeed landfill.

Prior to any decision, it is likely that there will be a significant amount of information given to the public by way of press articles, items in Calderdale Call, production of newsletters, the use of Talkback and face to face householder surveys in early 2006.

The Council will manage the waste procurement methodology and will need to allocate resources to supplement those existing within the waste services. External expertise will be sought on financial, legal and technical matters to bring the project to a satisfactory conclusion.

Any land use issues will be considered through the Local Planning Authority processes, including any public consultation needed.

4.7 Public Engagement

There is a need for effective public engagement driven by requirements to minimise waste, achieve recycling and energy recovery targets, and develop new waste treatment facilities. Commensurate with this is the need to identify sites and obtain planning permissions; either within the Borough or by partnership(s) elsewhere, in order to reduce disposal to landfill in favour of more sustainable methods.

Any waste treatment facility has the potential to create noise, dust, smells and other pollutants, as well as road congestion and visual amenity issues. Good public engagement can help in overcoming these issues, as well as enthusing communities to positively engage in waste issues and achieve the culture changes needed on waste minimisation, reuse and recycling.

The Select Committee on Environment, Transport and Regional Affairs (2001) suggests

> "the case for extensive and detailed public consultation makes itself: A sceptical public will not be convinced by simply being told that such facilities are required and planning for waste facilities can easily stagnate if proper consultation is shirked. It will take real consultation with a better informed public to achieve a consensus on local waste strategies and the facilities required to implement them".

In Calderdale, it was identified that there was a need to engage more effectively with the public and improve understanding of waste issues facing both individuals themselves and the Council.

Thus the Council has appointed a Waste Awareness Officer and begun a sustained waste awareness campaign. This has been funded from a variety of sources, including in-house funding, DEFRA, Waste Resources Action Programme (WRAP), and the Council has used a variety of methods and media, including:

- the Recycle for Calderdale Campaign
- the Reduce your Waste and Improve your Place campaign;
- home composting campaigns;
- the training of its recycling crews in Waste Awareness;
- a joint campaign with local newspapers;
- regular environmental supplements in the Council's newspaper;
- radio advertising;
- bus and poster adverts;
- a Recycling Rewards for Schools campaign;
- door stepping promotions;

In respect of specific public consultation, the Council can point to a number of initiatives.

1998 Calderdale Call - Council newspaper delivered to every household within the Borough (87,000) that highlights some of the waste issues facing the Council and invites feedback on waste issues.

2003 The Calderdale Waste Partnership, a group of individual organisations, local company representatives including not for profit organisations together with Council officials and Councillors who regularly meet to consider waste management issues relating to the Borough. The partnership plan joint initiatives, submit joint funding bids, and consider new waste treatment methods. Council officials consult through the partnership.

2004 Talkback – a forum of 1000 respondents selected to represent the whole community. Talkback goes out in questionnaire form with answers received being analysed to inform Council policy. Talkback provided data on Calderdale residents perceptions of the present collection system, and preferences for future collection developments during the autumn of 2005.

2005 Website - the Council's main website, is used to promote the Council's waste services and will be increasingly used to provide information on waste issues. During 2006 waste minimisation facilities will be included on this still developing site.

2006 The Householder Survey involving face to face interviews with 1400 individual householders. These interviews will inform Council policy on waste amongst other issues.

These represent current main mechanisms the Council uses regularly to consult with local communities.

Conclusion

The Council has gradually established a consultation culture, which will grow as the waste strategy evolves over time in its successor and updated versions. As this waste strategy takes over from the current interim strategy and procurement procedure is developed early, frequent and detailed public consultation and education will be required.

5.0 WASTE MANAGEMENT OPTIONS

This section will primarily deal with the Council's response to the legislative drivers outlined in Section 3 and the need to avoid landfill by increasing recycling, composting and possibly energy extraction. The available options for waste treatment are briefly described. However, waste reduction and reuse will be briefly considered first.

5.1 Waste Reduction

Continual growth in waste, has the potential to detract from any environmental benefits that may be achieved by the Council introducing new recycling and home composting services. It is not clear how well authorities will perform in terms of waste minimisation. Indeed there is a view that to be realistic, waste reduction is an area that local authorities can only be expected to influence marginally if at all. In addition that waste reduction could be more effectively promoted by Central Government working with the commercial sector to introduce appropriate legislation relating to the supply and end disposal of products and artefacts. An existing example of this approach is the WEEE[43] legislation. Evidence from the Integra Project[44] suggests that, at best, councils can only slow down the rate of growth in waste. Extract[45]:

2.3 The overall growth in waste arisings is in line with national trends, although anecdotal evidence suggests that comparable Waste Disposal authorities are experiencing greater growth. This may indicate that Project Integra's 'War on Waste' campaign is impacting to slow overall growth.

Calderdale MBC obtained funding from WRAP to develop and implement a waste awareness campaign, which ran from 2004 to 2006. This was achieved via a contract with the Enventure Consultancy and with assistance from the Calderdale Waste Partnership (CWP).

Nationally and regionally further action is needed to promote waste reduction/minimisation, particularly by supporting home composting, packaging reduction, and real nappy projects etc.

5.2 Waste Reuse

The Council has supported a number of waste reuse projects in the Borough including furniture, computers, textiles, reuse curriculum documents for schools, materials for play schemes, and nappies. The organisations involved are as follows:
Furniture - Sitting Comfortably & Ozzanam
Computers – Extended Life Computers

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[43] See page 39 for explanation of the WEEE legislation.
[44] Integra Project (The Integrated Waste Management Strategy Hampshire County Council begun in 1993) paid for by The Oynx Environmental Trust from Landfill Tax Money.
[45] Hampshire County Council, Waste Contract Panel 13th October 1999, Project Integra Annual Report Report of the County Surveyor.

Textiles – British Heart Foundation, Oxfam and The Yorkshire Air Ambulance Curriculum documents Pennine Magpie and the Alternative Technology Centre

It is anticipated that this area of Council policy operation will be strengthened by the introduction of a government introduced BVPI for MW reuse.

Nappies – Change Project.

The above organisations do not currently qualify for recycling credits (with the exception of those collecting and recycling textiles) as they are involved with reuse rather than recycling materials.

Whilst such projects have only a marginal effect on the amount of material in the waste stream, they do provide a valuable social service to the Borough.

5.3 Recycling & Composting

Recycling

The Council has improved the recycling rate over the last five years, the table below shows the results from 2000 onwards.

Table O - Overall Recycling Rates Calderdale MBC

YEAR	RECYCLING RATE (%)*	ANNUAL INCREASE %
2000-01	9.11	
2001-02	10.5	1.39
2002-03	12.87	2.37
2003-04	13.62	0.75
2004-05	17.05	3.43

* Includes green waste composting tonnage from HWRs's

This increase is the result of improvements that the Council itself made up to July 2003 and latterly by working with Focsa Services (UK) Ltd. The Contractor appointed in 2003 to run the Council's waste services. Implementing the Waste Management Action Plan[46] (WMAP) action on recycling has made recent significant improvements to the recycling rate. This action utilised the current contract provision to allow the purchase of extra recycling should the Council require increased recycling performance. The WMAP implementation was used to comply with the Household Waste Recycling Act 2003 which requires local authorities to collect at least two recyclates at the kerbside separate from the remainder of the residual waste.

The 2004/05 figures show a marked improvement of 3.43% (the highest ever % increase) on the preceding year even though the scheme only became operative from December 2004. The current year 2005/06 is expected to produce a recycling rate of just over 20%.

[46] Waste Management Action Plan, Report of the Group Director, Health and Social Care 17th May 2004 Actions page 9.

The recently completed, and DEFRA funded, “Calderdale Household Waste Recycling Centre Design & Management Study” shows that further significant improvements to the recycling rates are obtainable from waste deposited at the HWRSs. Such increases will be mainly dependent on the execution of planned physical improvements to site infrastructure, although some additional site staff training is envisaged. Further short term actions beyond present levels will be needed to attain the desired 24-25% rate.

Calderdale MBC was awarded funding from WRAP in 2005 to enhance the use of the green waste receptacles at HWRSs. Therefore, a programme of improvements are currently being introduced to each site, including; new highway directional signs, new on-site receptacle signs and entrance signs, the introduction of “welcomers” on some weekends throughout the year and the production and distribution of A-Z Recycling Guides and HWRS maps.

Composting

Composting in Calderdale is undertaken in two ways, the first is the composting of all green waste at Osset. The public currently delivers this green waste direct to the HWRSs. The table below shows this steadily increasing tonnage.

Table P - Composting Rates Calderdale MBC

YEAR	**COMPOSTING TONNAGE***	**ANNUAL INCREASE %**
2000-01	3557	
2001-02	3863	7.92
2002-03	4246	9.02
2003-04	4494	5.52
2004-05	5507	18.39

*Composting tonnage only

The second method is via Calderdale MBC’s Home Composting Campaign supported by WRAP; by Christmas 2004 some 12,460 compost bins had been sold at subsidised rates by the Council to rate payers living within the Borough. It is anticipated that WRAP will soon be defining a formula that will quantify the waste arisings saved by this campaign, and that DEFRA will formally recognise this form of waste diversion by regulation.

Calderdale MBC has recently been informed by WRAP that it will be awarded further funding to continue with Phase 3 of the Home Composting Campaign through 2006.

Zero Waste Growth & Impacts of Recycling & Composting on LATS

When considering some of the initial years of the LATS regime, that is April 2007 to April 2010 even if Calderdale could be certain of:

- limiting and keeping the waste **growth to zero**

- hit it's current predicted recycling rate of just over 20%[47]
- achieve a 25% recyclate/composting rate in 2007/08 for household waste
- and hold this to April 2010

There would still be a requirement to landfill around a constant figure of 71,000 t/pa of MSW between April 2007 and April 2010, (equivalent to 48,500 t/pa of bmw). However, the Council will be allowed to landfill only 54,205 t.p.a. 07/08; 48,135 t.p.a. 08/09; and 40,850 t.p.a. 09/10. Clearly by the last of these three years the Council will be well into debit, and without diversion from landfill paying substantial fines[48].

By 2019/20 the LATS allowance will have dropped to 28,000 tonnes (equivalent to19,039 tonnes bmw) when the projected requirement for landfill[49] is estimated to be about 64,000 t.p.a (equivalent to 43,334 tonnes bmw).

It is clear from the foregoing that even continued efforts in recycling/composting with rates of 20% 05/06, 25% 2007/08 to 2009/10, then 30% 2010/15 and 33% thereafter with waste minimisation will not allow the Council to meet the LATS obligations on their own. Therefore investment in some form of waste treatment technology that reduces landfill is required.

A review of likely available technologies follows:

5.4 Waste Treatment Technologies

This section seeks to briefly review and describe the types of possible technology available, its scale in terms of minimum or maximum annual tonnages, whether the design is modular, the likely land area required, and the time taken to develop a facility. An options appraisal summary is shown in Appendix 5.

Materials Reclamation Facility (MRF)

A MRF is usually a waste plant capable of receiving dry recyclables (paper, glass, food cans, textiles, etc.) either pre segregated, or co mingled, prior to further sorting and refining (removal of contaminants) to create a suitable "product" that will meet a specification set by a recycling merchant taking the sorted material..

The designs for an MRF falls into 2 main categories:

A low-technology MRF; where the majority of all sorting is done by hand via a picking station, but using in addition a magnetic extraction unit to remove the steel cans. This approach has a low capital cost, but high labour costs.

A high-technology MRF; which makes as much use as possible of extra mechanical sorting equipment, e.g., an eddy-current separator to separate aluminium cans. This

[47] Predicted to be just over 20% for 2005/06
[48] About £1.15M for 2009/10.
[49] With a projected recyling rate of 33% by that time.

results in a higher capital cost, and although labour costs are lower, some hand pickers are still required to meet specifications of merchants.

An alternative scenario to the above is a dirty MRF, where the total waste stream (crude unsorted waste) is fed through the plant. The main advantage is that there are no additional collection costs. However, the disadvantages are as follows:

- the plant produces a low grade product (often contaminated with other wastes) which attracts less income than the clean equivalent
- it also provides a very undesirable and unhealthy working environment.

In addition to the technical objections, this type of plant does not promote sustainable values amongst the public as the system will encourage them, to throw everything away in the same bin.

Such Dirty MRF plants have not proved very attractive to the UK market, in contrast to the cleaner ones.

The residues from MRF can either go directly to landfill disposal, or on to further treatment in a biological treatment plant, with the MRF possibly representing the M (mechanical) part of a full Mechanical and Biological Treatment (MBT) process. Very often the two processes MRF and MBT are integrated into one treatment facility at one place.

Mechanical Biological Treatment (MBT)

Mechanical Biological Treatment (MBT) plant are used to treat residual municipal waste by a combination of physical and biological processes. The biological processes are aerobic decomposition and anaerobic digestion. The physical processes include size reduction/shredding of the waste, separation of ferrous and non-ferrous metals, size classification, density separation, heat/steam treatment and screening and/or size reduction of outputs. MBT is an intermediate treatment process. Not all these processes are used in each plant and there are many possible configurations. There are usually several different outputs from the process: metals; glass; a high heat value fraction; liquid digestate which only arises from anaerobic digestion and a fine, solid fraction[50]*.*

Thus MBT is a generic term for a myriad number of similar waste treatment process plants that are configured in different ways giving varying technological options and combinations for waste treatment~~s~~. It follows that their respective performances will also vary, as will their capital set up and operating costs.

The basic aim of an MBT plant is to separate a mixed waste stream of unsorted dustbin waste into several component parts or fractions by mechanical means, to provide further options for recycling and recovery. The output specification relating to the processed waste will decide the exact configuration and order of processing for the plant. The primary design objectives of the plant could be to produce a solid

[50] EA definition.

recovered fuel (SRF) or conversely a low grade soil conditioner. Whatever configuration is used the output objectives would be one or more of the following:

- to extract the basic recyclate that is paper, cardboard, glass, plastics, ferrous metals, and non ferrous metals typically aluminium;
- to produce a part stabilised waste prior to landfilling;
- to biologically process a segregated "organic rich" component of the waste, to form a soil conditioner
- to produce a segregated high calorific value waste to feed an appropriate thermal process to utilise the energy potential of the waste.

The biological element of the process may either take place either before or after mechanical sorting of the waste. The table below shows the main mechanical waste separation technologies.

Table Q - Main Mechanical Wastes Separation Methods

1 Technology	2 Separation Property	3 Materials Extracted
Trommels & Screens	Size & Density	Oversize & Small
Manual Separation	Visual Examination	Plastics, oversize
Magnetic Separation	Magnetic Properties of the material	Ferrous metals
Eddy Current Separation	Electrical Conductivity	Non ferrous metals
Wet Separation Technology (floatation)	Differential Densities	Float – Plastic Sink – stones glass
Air Classification	Weight	Light & Heavy
Ballistic Separation	Momentum	Light & Heavy
Optical Separation	Optical Properties of polymers	Specific polymers

A key concern for local authorities is to produce a more **stable reduced volume biodegraded[51] residue**, which could be sent to landfill (the least acceptable option), or a residue which is subject to some type of energy recovery such as burning as a solid recovered fuel (SRF) to produce power. Alternatively they may wish to produce a compost aerobically to produce a low grade[52] soil improver or treat the waste anaerobically to produce a biogas.

Finding suitable end use markets for the outputs (particularly as such potential end uses are not well developed in the UK) is one of the main drawbacks of MBT. Capacity to burn SRF in cement kilns is limited, and uptake as an alternative fuel in power station is slow to take off (because of possible issues of salts in SRF causing corrosion problems in combustion plant boiler tubes), this means that specialised plants dedicated to burning SRF may need to be developed.

[51] The Environment Agency will measure each plants efficiency in biologically degrading the refuse and calculate the LATs tonnages deemed to have been landfilled.
[52] Markets for such materials are thought to be limited according to the EA guidance document (Environment Agency, "The Mechanical Biological Treatment of Waste and regulation of the ouputs Version 1 June 2005").

There will always in any event, remain some residues (typically 10%-20%) that will require landfill disposal.

MBT plants can be regarded as flexible and able to adapt to legislative or capacity changes due to their modular construction, for example extra lines can be added, reconfigured, or worked longer or shorter depending on differing shift patterns. A typical land take for a 75,000 t/pa plant is around 5,500m^2 for the building with a total land take of 15,000m^2[53].

MBT is becoming the most widely adopted alternative waste treatment option to mass burn incineration, and though well established on the Continent and in some states in the USA, it still has to prove itself operationally in the UK waste market.

In summary MBT often utilises a number of treatment technologies such as MRF, in-vessel composting, advanced thermal treatment, srf. These are discussed individually below.

Incineration

This can have a number of varying meanings, but in today's waste management industry, it is taken to mean "energy from waste - mass burn incineration"

Energy from Waste (EfW) facilities burn waste under controlled conditions, to reduce its volume and hazardous properties, and to generate electricity and/or heat. The majority of EfW plants operating in the UK are designed to process between 50,000 t.p.a. and 200,000 t.p.a. of municipal solid waste with no need to pre-treat the wastes before processing, although some oversize items arising from bulky waste collections and HWRS sites may not be suitable for processing in an incinerator.

Efw plants require process control measures for emissions and extensive flue gas cleaning equipment. There are two principal solid residues from thermal treatment systems: the bottom ash, which is the solid remainder of the waste feedstock after burning; and the flue gas treatment residues from the air pollution control process. Some residues from the stack emission control process are classified as hazardous waste and will require specialist treatment.

Significant capital expenditure can be anticipated. Running costs for a plant having an annual throughput in excess of 200,000 tonnes are proving competitive as a waste treatment option in today's market. Such a plant would have a typical land take of 10,000m^2 for the building.

Owing to the high capital costs involved, incineration plants require the willingness of an authority to enter into a long term (20+ years) contract and to supply a guaranteed minimum quantity of waste each year. Therefore such plants can be regarded as inflexible in being unable to quickly react to changes in waste quantities and composition over time. Burning technology is not easily or cheaply reconfigured.

[53] "Mechanical Biological Treatment & Mechanical Heat Treatment" page 18, Defra Waste Implementation Programme New Technologies, V.1.0, 2005

The main advantage of energy from waste is that it is proven technology with a solid track record all over the world, including the UK. Most of the residual outputs i.e., bottom ash, are inert and can be landfilled without the disadvantage of further degradation, and the production of the greenhouse gas methane within the land fill. The bottom ash can be further treated to extract the ferrous metal content for recycling, with the ash itself being used as a secondary aggregate (displacing the use of quarried virgin aggregate) for which markets in the UK are developing. Weight reductions in the order of 90% to 95% are usually obtained.

Only a small proportion of the ash i.e., fly ash requires specialised disposal treatment. The other main output is that of energy (electric power) and possibly residual waste heat in some kind of district heating scheme, both of which can replace the consumption of conventional fossil fuels such as natural gas and coal.

The main perceived disadvantage to the incineration of waste is potential risks to public health through air pollution and particularly the production of dioxins. Waste incineration has a very low acceptability rating from the public and environmental pressure groups. In an attempt to inform the industry and public about the health impacts of incineration, the Government has recently published its review in respect of incineration, and concluded that it:

> "did not find a link between the current generation of municipal solid waste incinerators and health effects. Adverse health effects have been observed in populations living around older more polluting incinerators. We considered cancers, respiratory diseases and birth defects but found no evidence for a link between the incidence of disease and the current generation of incinerators".

(Review of the Environmental and Health Effects of Waste Management - HMSO)

<u>Composting</u>

Composting processes for municipal waste management primarily fall into two categories; windrow composting, for green, or garden derived wastes, and a more contained or 'In-vessel' composting, some examples of which can (subject to regulatory approval[54]) process both garden and kitchen/catering derived organic wastes.

Windrow composting is an established technology for dealing with green wastes, where the material is first shredded and then piled in elongated rows (know as windrows). The windrows are aerated by either turning the windrows or by forcing air through the material. Windrow composting may take place in buildings or in the open air. Currently Calderdale's green garden waste is composted using the external windrow system.

There are also other techniques, such as static pile composting, where air is forced through the waste mass to promote biodegradation. Windrow composting is however

[54] Regulated by the State Veterinary Service

by far the most prevalent composting technique used in the UK and this method of operation is likely to increase over the foreseeable future.

In-vessel composting (IVC) embraces a variety of techniques whereby the kitchen and garden wastes may be composted together in an enclosed vessel or tunnel. The advantage of the IVC process is that it is possible to control the environment containing the compost more effectively to achieve and maintain the specified temperatures over a set residence time, to facilitate bacteria destruction (in accordance with the requirements of the Animal By-Products Regulation which governs the management of wastes arising from animal sources, including food and catering wastes).

It is this enhanced level of control that makes approved IVC systems appropriate for processing kitchen type municipal wastes in addition to green wastes. Not all IVC systems will be capable of processing kitchen wastes. Each individual compost plant will require approval from the Regulator (the State Veterinary Service). There is limited experience of In-vessel composting in the UK to date, but due to Animal By-Products legislation and the need to meet both landfill diversion and statutory recycling and composting targets, it is likely that this will be a growing area of biodegradable waste treatment.

External windrow systems require a substantial land take, as considerable room is required between the windrows for mechanical handling purposes. In-vessel plant of the same capacity tends, when compared to windrow composting, to result in a smaller land take as the process is usually of a continuous flow-line type. Typically a 200,000 t/pa capacity plant would require upwards 50,000m^2.

Anaerobic Digestion

Anaerobic Digestion (AD) is in-vessel biodegradation in the absence of oxygen where organic wastes, such as garden and kitchen waste, are converted into a ‘digestate’ (containing biosolids and a liquid) and biogas. In AD systems, biodegradable material is placed into an enclosed vessel under controlled conditions and processed at elevated temperatures.

Following the anaerobic digestion process the digestate containing biosolids and liquid can be used as a biofertilizer subject to market availability and suitable quality. Alternatively, the biosolids can be dewatered from the digestate and treated aerobically. The resultant compost like material can be used as soil conditioner. The use of both the digestate and dewatered biosolids will depend on the quality of the input material. Source segregated organic material, and efficient management and operation of the anaerobic process will generally produce a ‘cleaner’ product than material from a **mixed waste stream**. The presence and type of the markets available will influence the output specification and therefore the level of processing required on the digestate material.

The liquor or filtrate resulting from any dewatering stage is rich in organic compounds and may be re-circulated through the process, or used as a fertiliser, or alternatively

treated and then disposed of to the sewer. The alternative chosen is dependent on the exact nature of the process and the characteristics of the liquor.

The decomposition of the biodegradable material leads to the release of a biogas. The biogas (mostly carbon dioxide and methane) can be sold as fuel or burnt to generate electricity. The sale of this electricity will be eligible for Renewables Obligation Certificates (ROCs). ROCs provide a financial incentive for the production of electricity from renewable sources. Typical land take for a 200,000 t/pa plant would be in the order of 50,000m^2[55].

Advanced Thermal Treatment

This is a term covering a number of emerging technologies for treating MSW, but as yet remain unproven on a commercial level in the UK for treating MSW. The land take will vary depending on type/combination of ATT technologies, but could be similar to that of incineration i.e., 10,000m^2.

Pyrolysis

Pyrolysis, often incorporating gasification (see below), is a medium temperature thermal process where organic derived materials in the waste are broken down under the action of heat, and in the absence of oxygen. Pyrolysis is similar to the process which produces charcoal. Only carbon-based materials can be pyrolysed. Where MSW is to be used it is normally pre-sorted to remove the majority of the non-organic material and may be mechanically processed to homogenise the feedstock. A prepared Solid Recovered Fuel (SRF) from another appropriate process like MBT may also be used. The pyrolysis process heats the wastes, typically to around 500°C, and breaks down plastics, paper and other organic derived materials to produce a pyrolysis oil. The pyrolysis oil or the gas may be used as a fuel to generate electricity or to power other internal combustion engines. Flue gas clean up measures would be required for pyrolysis facilities. A solid slag (pyrolysis char) is also produced which may require disposal or additional processing.

Gasification

Gasification operates at a higher temperature range than pyrolysis, typically 1000 - 1200°C. Air or oxygen is used to partially combust the waste to achieve higher temperatures. Gasification is equivalent to the process which produced ‘town gas’ from coal. Additionally for gasification, water is added to the gasifier, either as steam or as water included in the feedstock. At these high temperatures the water ‘cracks’ in to hydrogen and oxygen. The oxygen reacts further with the carbon in the feedstock (waste) material. The differentiation between pyrolysis and gasification is the high concentration of hydrogen in the gas produced by the process. As with pyrolysis the gas produced (known as syringes) can be burnt to generate electricity. A solid residue (char) is also produced which usually requires disposal if no markets for recycling are available. Flue gas clean up measures would be required for emissions from gasification facilities.

[55] Bedminister in vessel plant 54,000m^2 for 200ktpa plant.- Eco Deco 42,00m^2 for 180ktpa plant with materials recovery. Source Environment Agency Waste Technology Data Centre.

Landfill

Though at the bottom of the sustainability list (waste hierarchy), it will remain an essential and integral part of any waste strategy for the foreseeable future, as there will **always remain fractions** from all waste treatment processes, for which landfill is the only Best Practicable Environmental Option (BPEO).

The regulation and engineering of landfills has now reached a high level of technical capability aimed at reducing their environmental impact caused by leachate and methane gas emissions. It is considered that these technical developments will continue into the future to further reduce these impacts. The sustainable use of landfill will offer the continued renewal, restoration and reuse of large areas of otherwise despoiled land (quarries etc) that would otherwise require vast quantities of material from another source, to reclaim the land for beneficial use.

Other Waste Management Alternatives

Autoclaving

Autoclave technology has been used to sterilise certain hospital type wastes (clinical waste) for many years and is essentially a steam treatment process. It may be used in a municipal waste context where it shares similarities with MBT. Unsorted dustbin waste arriving at the autoclave plant is shredded, and then processed in a pressurised sealed drum under the action of steam. The waste structure degrades very quickly (but dose not digest) because of the injection of high-pressure steam and the tumbling action of the drum. After around an hour of processing the waste is reduced to a 'floc' like material, with metals and glass partially cleaned for extraction as recyclables, the process deforms plastics making them either more or less difficult to recycle, depending on the process and the polymer type. The remaining material may be sorted and the high calorific fraction thermally treated as a type of solid recovered fuel (SRF) or composted/digested as the market demands. There are also other markets and uses being investigated for this floc like material. It should be pointed out that these processes are at the early stages of development and are likely to take some time to reach full scale commercial development. There will typically be a residue for disposal from mixed MSW processing.

5.5 Land Availability and Status and the Commercial Implications

The availability of land suitable for constructing waste treatment plants is a **key factor in waste treatment plant procurement process**.

The Council, as a Waste Planning Authority, will be preparing a Waste Management Plan (starting in April 2006) that will set out policies and proposals in accordance with sustainable development, national and regional strategies, through the waste hierarchy and this the Councils Waste Management Strategy, to provide appropriate facilities in locations to deal with the management of waste in the District.

However in the interim period the Council needs to give early considerations to land issues and the identification of sufficient and suitable land if any, and to understand on what likely terms such land could be made available for the exclusive use of bidders in pursuit of any contract won for waste services in Calderdale.

If suitable land is not made available for waste treatment plants there is a risk to the Council that **contractors will choose not bid**. If a contractor takes the risk to bid leaving the finding of suitable land until later in the process, the procurement process will run the risk of delays and LATS fines.

The planning process will require the Waste Planning Team to examine amongst other criteria sustainability (waste hierarchy), the proximity principal, take account of regional strategies and will apply a series of tests sequentially when searching for sites. This process is a mandatory planning requirement.

The Council's Asset Management Department may also be able to identify suitable Council owned land, including that leased to a third party, or take options out on privately owned sites.

Land could not be assigned responsibly for waste disposal in the past until such time as the future needs for Council waste treatment plant became clearer and the disparate Waste Strategy was updated. The primary driver legislation is now in place (LATS), and action must now be taken to clearly address the land issue.

If no land can be found after applying the planning process in collaboration with the Waste Strategy or if the process of acquisition is deemed to be too lengthy then it will become necessary to consider joint working with other authorities, to get access to the necessary land. If this approach is not feasible then re-examination of potential sites will be required.

5.6 Possible Funding Arrangements

For any procurement of waste treatment, it is difficult to say what the likely value of any contract will be, as this will depend on its scope and length of time. However a typical 25 year contract to design, build, finance, and operate, a waste treatment facility and associated WDA operations for Calderdale's MSW could have a value of approximately £250m[56] for operational costs excluding initial capex and procurement costs ending in 2030.

For a contract of this magnitude there is a significant in-house procurement cost which must not be overlooked. Total approximate funding of £600,000[57] should be made available for the procurement process to begin in 2006/07 to commence this process. In addition it is necessary to appoint external technical, legal and financial consultants to advise on such a specialised procurement process.

[56] Waste Monitoring Officer - assuming a maximum of 25% recycling (30% from 2010), 3% waste growth p.a, dealing with all municipal waste, and based an average c.p.t. of £60p.t in 2005 and a cost of £97 p.t. in 2030 (cost indexing 2% p.a.).

[57] Figure from Corporate Procurement Officer based on for example an £8M & 60,000 t.p.a. BMT plant at 5%-10% procurement costs.

Possible funding arrangements will include:

- Private Finance Initiative (PFI);
- Public Private Partnership (PPP);
- Service Contract (Gate Fee);
- Prudential Borrowing (PB);
- Other.

PFI

This is a Government initiative to assist local authorities to raise money to pay for services, requiring long term contracts with the private sector which have significant levels of capital investment.

The private sector operator is normally contracted to design, build, finance and operate a public facility (e.g., a waste treatment plant), and will normally set up a Service Company, also known as a "Special Purpose Vehicle" (SPV) to deliver the contract and take on the risk of doing so, leaving parent companies free of such risks.

The private sector will borrow the required capital funds (from banks) for the scheme, and the local authority will pay the SPV an annual fee over the contract period. The Government (Defra) will repay to the Local Authority an agreed sum known as "PFI credits" which will have been agreed to assist in repaying the capital. In borrowing from banks, the waste contractor will need to demonstrate to the banks satisfaction that the proposed waste treatment technologies are robust and that the project as whole has a high "bankability" factor.

Defra has set certain parameters for PFI credits. For example they will not consider PFI for waste schemes where capital involved is less than £20m, and will pay credits up to a £40m ceiling for any single project, although **joint working with other neighbouring authorities can attract more**. To date (2005) 9 PFI contracts have been awarded in the waste sector.

The PFI route requires the private sector to put up the capital at its own risk, and the initiative has to deliver to clear and defined service level goals (output based specifications) to the public over a long term contractual period. Specifically for waste service PFI's, Defra will set a minimum level for recycling performance often at 50%.

Public Finance Initiatives are complicated and require longer procurement time (and therefore expense) to set up, and attract Defra performance targets. It is known that PFI funding is usually, only available for joint local authority projects in excess of £30M. It is unlikely therefore that a small authority such as Calderdale, working alone would attract PFI funding from the government.

PPP

PPP are the same as PFI, but without the funding credits from Government and the additional performance targets from Defra, and are therefore less time consuming and cheaper to procure.

Service Contract

A private contractor may be willing to enter into a contract to provide and operate waste treatment facilities. For example Estech offer their technology only on a build, own and operate basis, they do not sell plants. In so doing they believe they can better co-ordinate the development of markets for the fibre and other recyclates. Contracts with local authorities are likely to include a cost per tonne of input and guarantees on issues such as recycling and diversion targets. The charges levied are usually structured to achieve a smooth profile over the life of the contract.

Prudential Borrowing

The Local Government Act 2003 allows local authorities greater freedoms to raise external capital finance, subject to the "prudential code". Local authorities can set their own borrowing limits provided they can afford to repay the debt, without any additional central government support, and therefore without any central government approval to do so. Local authorities can borrow capital at lower rates than the private sector waste contractors, and may view the circumstances as an "invest to save", opportunity.

Other

It is possible that capital sums could be raised by local authorities from a variety of other sources such as other EU and Government grants, own capital receipts, and the Public Works Loans Board an independent and unpaid statutory body that operates under the Public Works Loans Act 1875 and the National Loans Act 1968. Borrowing done through the Public Works Loan Board, can be the most attractive source of borrowing available. Current annual rate for a fixed rate 25 year loan being 4.25%.

5.7 Affordability of Options

In order to put into context (and for comparability purposes) the costs of any possible future waste treatment options, it is worth considering the likely costs of a "do nothing" option i.e., do nothing more than is already being done. This will effectively establish an affordability base line for appraisal purposes.

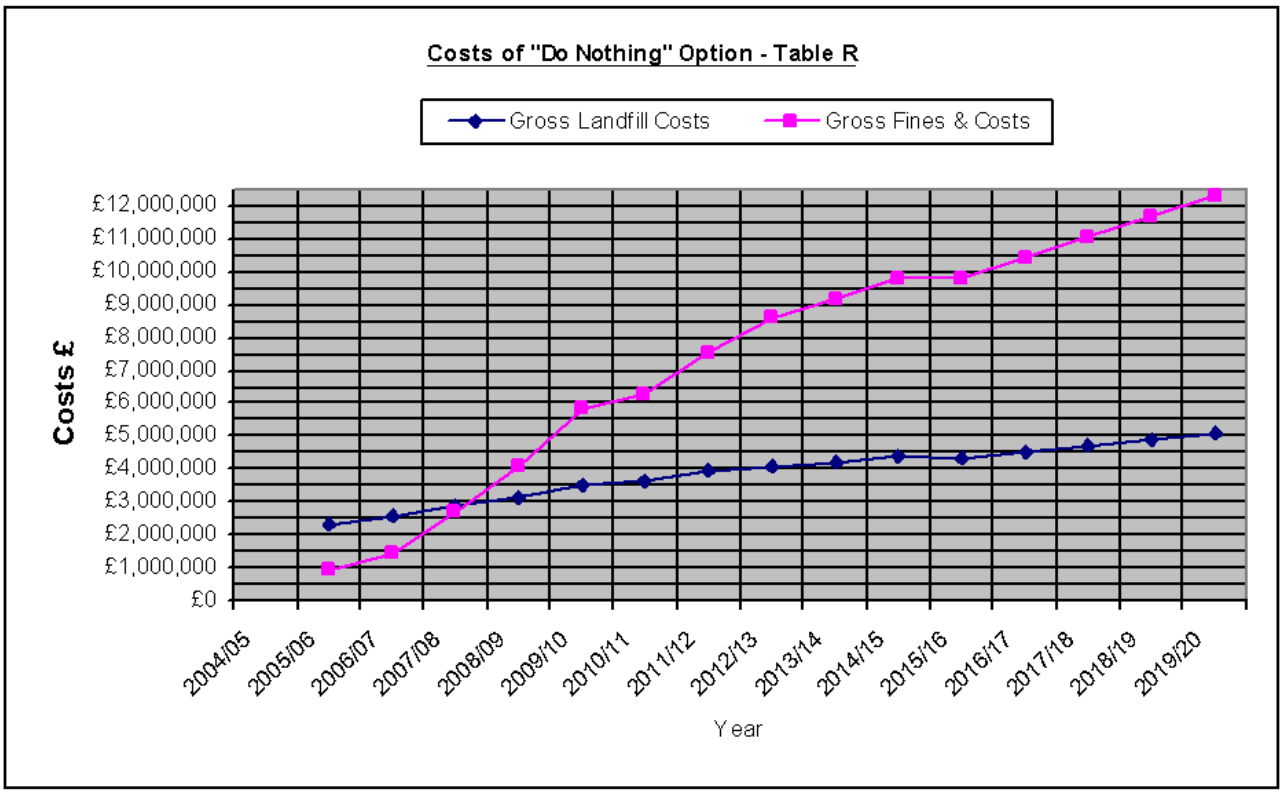
Assuming no additional diversion, and an annual rate of increase 3% p.a. MSW will grow from around 88,000 tonnes 06/07 to 130,000 tonnes by 2020. Continuing with the current recycling rate of 20% will increase quantities of recyclate from 18,000 tonnes per annum in 06/07 to 26,000 tonnes per annum in 2020. This will still leave

quantities of MSW going to landfill increasing from 71,000 tonnes in 06/07 to 104,000 tonnes per annum by 2020[58].

The 'do nothing' option assumes the Council purchases surplus landfill allowances from other authorities at an unknown cost per tonne[59] or pays the fine of £150 per tonne to dispose of waste over its allowances. Additional costs are possible if the UK Government is fined by the EU.

The landfill gate fee costs of this are illustrated in Table R below. It is assumed that landfill tax increases to £35 per tonne by 2010/11 and remains at that level. All other costs associated with waste disposal operations handled by FOCSA (e.g., transfer loading, HWRS sites etc) along with attendant refuse collection service costs, are assumed to remain constant in real terms. Landfill gate fees have been indexed up by 2.5% annually.

Table R - Waste disposal contractual costings "do nothing" option.



It can be seen that the approximate landfill gate fee (including landfill tax) will rise to £3.5m by 2009/10, £4.1m by 2012/13 and £5.1m by 2019/20. However when LATS fines of £150/t are included, these costs generally[60] rise to £5.8m, £8.6m and £12.3m

[58] Waste Monitoring Officer – Figures for 5.7 Waste Strategy
[59] Currently about £30 p.t.
[60] Gross landfill costs are initially shown higher than gross fines and costs because early + LATS allowances have been deducted as a notional income at £150 p.t. from overall landfilling costs.

respectively[61]. Costs from 2020 - 2030 will increase with growth in the quantity of waste handled.

Broken down to a rate per tonne (i.e., the costs including LATS divided by the **total waste landfilled in the same year**), produces the following (rounded) figures:

Table S - Costs Per Tonne Analysis[62]

Year	Gross cost (inc landfill tax) £Ms	Gate Fee £ per tonne	Total cost and LATS £Ms	Gate Fee + LATS £ per tonne	Cost per tonne landfilled if over LATs allowance
2009/10	3.5	42.00	5.8	70.00	192.00
2012/13	4.1	48.00	8.6	102.00	198.00
2019/20	5.1	51.00	12.3	124.00	200.94

In any procurement process the Council should seek to achieve a successor waste treatment solution to divert MSW from landfill (and meet statutory targets) that is as close to the existing and projected landfill gate fee as possible. Additionally this higher cost must be lower than the costs associated with the “do nothing” option. It follows that to achieve this economical solution any procurement process must be as competitive as possible. This in turn means that the Council must although a small authority with a small annual tonnage compared to most other authorities put it self in the position of attracting as many contractors to bid, as is possible. This “positioning” may require joint working with other authorities.

Advice produced by DEFRA, and shown in Appendix 6 illustrates the indicative timescales involved in the successful bidder delivering the waste treatment option and thus the “step change” in the Council’s waste management performance. The lead in time for any type of facility suitable for Calderdale is likely to take at least 4 years to become available. Therefore it can be assumed any new facility will not become operational before April 2010.

This means that in the short term to 2010, the Council faces the increasing annual disposal costs as shown in Appendix 4 and part illustrated in Table T.

[61] Waste Monitoring Officer – Assumes 3% waste growth, 20% recycling 05/06, 25% recycling between 2006/07-2009/10, 30% recycling between 2010/11–2014/15, 33% thereafter. Landfill Tax included and basic landfill contract costs indexed at 2.5% p.a.

[62] Assumes 3% waste growth, 20% recycling 05/06, 25% recycling between 2006/07 – 2009/10, 30% 2010/11-2014/15, and 33% thereafter. Landfill Tax included and basic landfill contract costs indexed at 2.5% p.a.

Short Term Actions

A “do nothing” option should meet the statutory recycling/ composting target of 18% for Calderdale (as the current projected figure is 20%) in 2005/6. The Council has already approved extra expenditure to purchase an extra module of recycling, to spend to save, in the short term, to improve recycling performance and thereby reduce waste to landfill. Thus for the future the Council has allocated budgets in 2007/08 to increase recycling to divert further waste from landfill to enable LATS allowances to be used more effectively.

An indicative guide as to the maximum affordable cost of any new initiatives, which can meet targets and avoids LATS, can be derived from the costs outlined above. This would suggest £41 per tonne as the maximum affordable over the short term period to 2010 (calculated by dividing gross disposal cost for 2009/10 by the total tonnages for 2009/10). If during 2009/10 real-time projections for that year show that the previously projected waste arisings tonnage will be exceeded, or that the recycling tonnage is going down, then the cost per tonne figure of £41 per tonne for that year will also go up[63], hence action should be taken. Any cost option up to £41 should be used. The table below shows the costs per tonne using both total waste arisings and that waste tonnage going to landfill. Clearly if a waste received is identified on receipt as that which can only be destined for landfill disposal, a higher cost per tonne alternative is justified say £59 p.t. for that year.

Table T - Costs[64]Per Tonne

Year	Cost £/Tonne GF+LT+LATs/Total MW	Cost £/ Tonne GF+LT+LAT/Lndf. MW
2005/06	23	29
2006/07	26	33
2007/08	26	36
2008/09	29	39
2009/10	41	59
Average cost 5 years	29	39

Therefore any new initiatives will be worth pursuing if the cost is less than £53/tonne in 2009/10, to achieve the recycling and composting targets and keep below the LATS allowance tonnages to landfill for that year.

Such options could include one or more of the following:

- improving recycling at HWRSs (up to 60% recycled from 30%)
- waste minimisation suggestions outlined in section 3;

[63] Because the authority has gone further above the yearly fixed LATs allowance tonnage @ £150 per tonne for each additional tonne.
[64] Assumes 3% waste growth, recycling at 20%,25%,30%, and 33% over the usual years. LATs costs , and Landfill Tax included, landfill costs indexed at 2.5% p.a.

- new kerbside collection rounds to collect green garden waste or kitchen waste;
- other dry recyclables e.g., cardboard, cans and plastics bottles which can be collected at the kerbside;
- develop kerbside recycling options for hard to reach properties that can not readily accept a box and bag;
- short term contracts for alternative treatment options to extract more recyclate/and or compost/and or energy from unsorted MSW.

5.8 Procurement Model for Long Term Contract

There are 4 elements to be considered in achieving the desired outcome of new waste treatment facilities.

- Design (D)
- Build (B)
- Finance (F)
- Operation (O)

How these elements are blended together will dictate the ultimate nature of the contract, and will themselves be influenced in part by the type of funding arrangements agreed.

Procurement Model

1. Private Finance Initiative – usually DBFO

   A typical PFI contract would see the Council have one single contract with a contractor who would design build finance and operate via a long term 25 year contract. In order to develop an integrated PFI contract other services such as refuse collection could be included in the contract scope. Most of the risk is transferred to the contractor in such arrangements.

   The contract will see the contractor receive regular payments to cover both its capital outlay and running costs, plus agreed performance payments (or penalties). Usually at the end of the contract the waste treatment facility becomes the property of the Council, subject to certain return conditions.

2. Public Private Partnership – usually DBFO

   A PPP arrangement could be very much the same as PFI.

   However if the Council wished to retain more control and therefore more risk, variations could be considered:

   a. letting of a number of service specific contracts e.g., refuse collection, HWRS sites, waste treatment etc., fully funded by the private sector, with the management and co-ordination of the contracts resting with the Council;

or

b. letting contracts for design, build and finance, but with the Council operating the new facilities, and thereby retaining operational control for the waste management service elements.

3. Prudential Borrowing – usually DB

Very similar to 2b, however the Council raises the finance itself via prudential borrowings, and therefore owns and operates the new waste treatment facility.

3a. As 3 above but includes operation of new facilities with the contractor i.e., becomes a DBO arrangement, the Council retains ownership of the new facility but allows the contractor to use it on some type of exclusive basis.

4. Service Contract – usually DBFO

The single contractor provides and operates a waste treatment facility, and the Council contracts to deliver to that facility agreed annual tonnages over a period of time, for which it pays a "gate fee" for each tonne delivered as per an agreed schedule of rates (similar to existing landfill contracts).

Where 3 and 4 are considered, it **will require the Council to be much more specific as to the type of waste treatment technology it desires**, thus moving somewhat away from an output based specification arrangement.

Timing & Resources

These different contract options have different timescales associated with them. Construction of plant can take up to 2 years (Appendix 6) and it will be seen that PFI might exclude itself because new processes would not be in place by the desired 2010 deadline.

The following table on the next page gives an indication of procurement time and resources.

Table U - Procurement Times

	Service Contract	Prudential Borrowing	Public Private Partnership	Private Finance Initiative
Timescales for tendering to commence construction	12 to 18 months	12 to 18 months	24 to 36 months	30 to 48 months
Staffing	Small client team with specialist advisory support	Larger client team with legal, financial, technical and insurance advisers	Large client team with legal, financial, technical and insurance advisers	Large client team with legal, financial, technical and insurance advisers
Client external costs	£50k to £150k	£50k to £150k	£250k to £1M	£500k to £1.5M

6.0 OPTIONS APPRAISAL

6.1 Introduction

It will be in the Councils interest (refer section 4.4) that the procurement exercise should result in a number of waste treatment solutions being proposed to the Council (see Appendix 5) in what will be a sellers market. It is important that the Council positions itself so as to attract the maximum number of bids (see par.1 page 69). These bids will need to be appraised. This document will be used together with a specification to inform potential contractors of the key aspects that will be considered in this appraisal.

The following pages identify the scale of the waste treatment processed required to deal with waste from Calderdale and the criteria used when assessing options to be put to the Council. The type of waste disposal contract specification used is important, i.e. should an output based specification be used, or a tight and more prescriptive specification utilised, specifying a particular waste disposal process. In addition affordability, cost and the method of actually procuring a waste disposal contract are considered of primary importance in the options appraisal process.

The Council must procure waste treatment facilities that enable it to:

a) meet its statutory recycling targets (including those proposed in WS2000);
b) comply with its landfill allowance allocations;
c) maximise disposal to landfill within allowances; and
d) provide **flexibility** to respond to the predicted increases in waste quantities.

6.2 Developing a Processed Based Specification

One alternative would be to produce a contract specification that specified a particular process or combinations of processes to achieve the Councils objectives for economic, and sustainable waste disposal for the foreseeable future, that is achieve in particular the objectives a to d in the previous paragraph.

Paragraph 4.4 discussed the prevailing market conditions that do not encourage a processed based specification for Calderdale. In particular Calderdale is at a disadvantage with regard to land availability, and the small annual tonnage it has for disposal compared with other authorities in the West Yorkshire Region.

Any attempt at a processed based specification would tend to constrain the Council towards smaller and more speculative proposals or to more technologically advanced processes which would undoubtedly entail a greater degree of risk than the Council would want to endorse. For example to choose gasification would mean that only a handful (there are four listed on the Environment Agency Waste Data Centre) of companies would be likely to bid.

However if the Council is prepared to endorse extra risk with new methods of waste disposal using the “new technologies” then processes are available.

6.3 Developing an Output Based Specification

From Calderdale's perspective an output based contract, could overcome at least some of the disadvantages the Council is faced with, that is to say stipulating only the outcomes in terms of:

- the landfill diversion tonnages achieved
- the compliance with annual LATS allowances
- meeting statutory recycling rates
- how and by whom recycling is done
- the flexibility of future plant provision in terms of process tonnage

By adopting this approach the Council may be able to attract a sufficient number of high quality bids to make the procurement process a robust process which attracts a competitive pricing outcome for the Council.

Even an output based contract does not overcome the land question or the relatively small tonnage that is available for disposal, however a joint procurement process with another authority could overcome both these principal issues for Calderdale. Should joint working with Bradford Metropolitan Council become a real possibility then it is understood that both land and an increased joint annual tonnage will give both councils benefits from economy of scale.

Contractors will be attracted to the contract because of the larger tonnages available for processing, with the potential for increased profits, and both councils should get a better gate fee. Procurement costs could be shared and the larger joint tonnage will enable more effective and efficient plants to be built to process the two authorities wastes.

Tenderers will be asked to identify the extent to which their solutions better both the recycling rates and landfill allowances, and the extent to which future proofing has been built in to cope with the increased quantities of waste predicted to arise.

Establishing the scale of waste treatment facilities required for the Borough.

1. 25% Recycling

   As it is unlikely that any new waste treatment facilities for the longer term will be available before 2010, it is assumed that, in the interim to 2010, the Council implements short term actions which have the effect of raising the recycling/composting rate of household waste from the current projected rate of 20.15%[65] to 25% for 2006/07 to 2009/10, then 30% for 2010/15 and 33% thereafter. In 2005/6 this will require the recycling/composting of some 19,000 tonnes/pa, continuing to rise in line with waste growth at 3% to 28,000 tonnes/pa by 2010. It is the view of waste managers that 25% recycling will not

[65]Projected recycling rate 2005/06 20.15% - Waste Monitoring Officer

be achievable without more short-term interventions for waste treatment being introduced in advance of the longer term procurement.

The most apparently obvious solution to immediate landfill tonnage reduction is to improve the recycling performance of the HWRS so that the amount of recyclate recovered from them increases rapidly. If yet further tonnage reduction is required then further source separation of wastes could be considered. For example kitchen waste composting could be carried out (although from the Calderdale Waste Analysis this would only reduce the tonnage by about 8,000 p.a.[66] based on 100% householder participation). Planned improvements in the HWRS will also contribute to tonnage reductions as will opportunist use of any new waste processing facilities as they become available.

From 2010 to 2020 and beyond given the need to continue[67] to comply with the Household Waste Recycling Act (see 3.2 above) it is assumed that 30% can be sustained in line with waste growth and that with increased recycling[68]; that 49,000[69] tonnes will need to be recycled or composted by 2020. Compliance over and above what is required by the Act will possibly require a more sophisticated collection of multi dry recyclables, perhaps requiring alternate week collections. Specialised multi compartmentalised containers and/or collection vehicles to achieve a household waste recycling rate of 30% may be required.

The Council may wish to vary the materials collected for recycling to identify the most cost effective recycling operations for the Borough having regard to the waste treatment technologies proposed by the contractor. This is because some treatment methods are susceptible to changes in the waste stream/collection method, which can positively or negatively affect the process efficiency.

The Council will also wish to work towards the recycling targets contained in **WS2000**, that is 33% by 2015. The contractor will need to demonstrate how its proposal will enable this target to be met and sustained.

2. Maximising the Use of Landfill Allowances and the affects of plant efficiencies

The spreadsheet Appendix 4 anticipates a landfill disposal rate (gate fee only) in 2010/11 of £43/tonne, rising to £52/tonne by 2019/20 (see Total Gate Fee Col. 9). Unless, over the same period, any procured waste treatment option can better the landfill price, it will be assumed that landfilling up to the limit of the allowances (19,000 t/pa bio MSW (27,999 real tonnes) as shown in Appendix 4 by 2020) is the most economically advantageous option.

[66] Using 100% kitchen waste only.
[67] Calderdale does already comply.
[68] Increased recycling 25% to 2009/10, 30% 2010/11 – 2014/15, 33% thereafter.
[69] For a 3% waste growth rate.

However **room must be left within the LATs allowances** for the end disposal of any worthless residue left after processing is complete, that can only be disposed of by landfilling. Analysis has shown that in Calderdale's case a plant that is 70% efficient (70% diversion 30% to landfill) will only just cope by 2019/20. After that year a plant efficiency in excess of 70% will be required. The highest efficiency available excluding the new technologies is that given by Efw at about 92%.

3. Possible Output Specification

Council officers believe that potential bidders for a contract to procure waste treatment facilities for the Borough would prefer an output based specification based on the achievement of the targets identified earlier, rather than identifying specific technologies or processes. See par. 4.4 page 49 for iteration and section 5.7 page 69.

6.4 Treatment Capacity Required

In order to achieve the targets referred to earlier, and taking account of the need to consider future **waste growths** and **plant efficiencies**, it is possible to predict the capacity of treatment facilities needed to deal with municipal waste from the Calderdale Borough.

TABLE G1, 2, 3 shows the indicative capacity of waste treatment facilities required to deal with municipal waste in or from the Calderdale Borough (assuming 1,2 and 3% growth in household waste per year).

Table G1 1% MW Growth

Year	Municipal Waste	Recycling (see note 1)	Residual Waste	Lats allowance in real terms	Net weight over allowances	Process Capacity to treat waste Tonnes
2004/05	93,797					
2005/06	85,913	17,183	68,730	92,212	-23,481	0
2006/07	86,772	17,354	69,418	86,856	-17,438	0
2007/08	87,640	21,910	65,730	79,713	-13,983	0
2008/09	88,516	22,129	66,387	70,787	-4,400	0
2009/10	89,401	26,820	62,581	60,074	2,507	3,134
2010/11	90,295	27,089	63,207	53,387	9,820	12,275
2011/12	91,198	27,360	63,839	46,700	17,139	21,424
2012/13	92,110	27,633	64,477	40,013	24,464	30,580
2013/14	93,031	27,909	65,122	38,297	26,825	33,531
2014/15	93,962	31,007	62,954	36,581	26,374	32,967
2015/16	94,901	31,317	63,584	34,865	28,719	35,899
2016/17	95,850	31,631	64,220	33,147	31,073	38,841
2017/18	96,809	31,947	64,862	31,431	33,431	41,789
2018/19	97,777	32,266	65,511	29,715	35,796	44,745
2019/20	98,755	32,589	66,166	27,999	38,167	47,709
2020/21	99,742	32,915	66,827	27,999	38,829	48,536
2021/22	100,740	33,244	67,496	27,999	39,497	49,371
2022/23	101,747	33,577	68,171	27,999	40,172	50,215
2023/24	102,765	33,912	68,852	27,999	40,854	51,067
2024/25	103,792	34,251	69,541	27,999	41,542	51,928
2025/26	104,830	34,594	70,236	27,999	42,238	52,797
2026/27	105,878	34,940	70,939	27,999	42,940	53,675
2027/28	106,937	35,289	71,648	27,999	43,649	54,562
2028/29	108,007	35,642	72,364	27,999	44,366	55,457
2029/30	109,087	35,999	73,088	27,999	45,090	56,362

Note 1: 20% recycling between 2005/06 - 2006/7, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14, 33% thereafter.
1% growth in municipal waste
80% recovery from treatment

Table G2 2% MW Growth

Year	Municipal Waste	Recycling (see note 1)	Residual Waste	Lats allowance in real terms	Net weight over allowances	Process Capacity to treat waste Tonnes
2004/05	93,797					
2005/06	85,913	17,183	68,730	92,212	-23,481	0
2006/07	87,631	17,526	70,105	86,856	-16,751	0
2007/08	89,384	22,346	67,038	79,713	-12,675	0
2008/09	91,172	22,793	68,379	70,787	-2,408	-3,010
2009/10	92,995	27,898	65,096	60,074	5,023	6,279
2010/11	94,855	28,456	66,398	53,387	13,012	16,265
2011/12	96,752	29,026	67,726	46,700	21,026	26,283
2012/13	98,687	29,606	69,081	40,013	29,068	36,335
2013/14	100,661	30,198	70,463	38,297	32,165	40,207
2014/15	102,674	33,882	68,792	36,581	32,211	40,263
2015/16	104,727	34,560	70,167	34,865	35,303	44,128
2016/17	106,822	35,251	71,571	33,147	38,424	48,030
2017/18	108,958	35,956	73,002	31,431	41,571	51,964
2018/19	111,138	36,675	74,462	29,715	44,748	55,934
2019/20	113,360	37,409	75,951	27,999	47,953	59,941
2020/21	115,628	38,157	77,470	27,999	49,472	61,840
2021/22	117,940	38,920	79,020	27,999	51,021	63,777
2022/23	120,299	39,699	80,600	27,999	52,602	65,752
2023/24	122,705	40,493	82,212	27,999	54,214	67,767
2024/25	125,159	41,302	83,857	27,999	55,858	69,823
2025/26	127,662	42,129	85,534	27,999	57,535	71,919
2026/27	130,215	42,971	87,244	27,999	59,246	74,057
2027/28	132,820	43,831	88,989	27,999	60,991	76,238
2028/29	135,476	44,707	90,769	27,999	62,770	78,463
2029/30	138,186	45,601	92,584	27,999	64,586	80,732

Note 1: 20% recycling between 2005/06 - 2006/7, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14, 33% thereafter.
2% growth in municipal waste
80% recovery from treatment

Table G3 3% MW Gowth

Year	Municipal Waste	Recycling (see note 1)	Residual Waste	Lats allowance in real terms	Net weight over allowances	Process Capacity to treat waste Tonnes
2004/05	93,797					
2005/06	85,913	17,183	68,730	92,212	-23,481	0
2006/07	88,490	17,698	70,792	86,856	-16,064	0
2007/08	91,145	22,786	68,359	79,713	-11,354	0
2008/09	93,879	23,470	70,410	70,787	-377	-471
2009/10	96,696	29,009	67,687	60,074	7,614	9,517
2010/11	99,597	29,879	69,718	53,387	16,331	20,414
2011/12	102,585	30,775	71,809	46,700	25,109	31,387
2012/13	105,662	31,699	73,964	40,013	33,950	42,438
2013/14	108,832	32,650	76,182	38,297	37,885	47,357
2014/15	112,097	36,992	75,105	36,581	38,524	48,155
2015/16	115,460	38,102	77,358	34,865	42,493	53,117
2016/17	118,924	39,245	79,679	33,147	46,532	58,165
2017/18	122,491	40,422	82,069	31,431	50,638	63,298
2018/19	126,166	41,635	84,531	29,715	54,817	68,521
2019/20	129,951	42,884	87,067	27,999	59,069	73,836
2020/21	132,550	43,742	88,809	27,999	60,810	76,013
2021/22	135,201	44,616	90,585	27,999	62,586	78,233
2022/23	137,905	45,509	92,396	27,999	64,398	80,497
2023/24	140,663	46,419	94,244	27,999	66,246	82,807
2024/25	143,477	47,347	96,129	27,999	68,131	85,163
2025/26	146,346	48,294	98,052	27,999	70,053	87,567
2026/27	149,273	49,260	100,013	27,999	72,014	90,018
2027/28	152,258	50,245	102,013	27,999	74,015	92,518
2028/29	155,304	51,250	104,053	27,999	76,055	95,069
2029/30	158,410	52,275	106,134	27,999	78,136	97,670

Note 1: 20% recycling between 2005/06 - 2006/7, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14, 33% thereafter.
3% growth in municipal waste
80% recovery from treatment

This information suggests the size of processing capacity required either within or close to the Borough based on an 80/20 process (80%diversion 20% landfill). There are four significant issues arising from this analysis:

(a) This shows that the process tonnage required increases with time, and that assuming an 80/20 process[70] roughly 16 times more processing capacity will be required by 2029/30, if waste grows at 2% p.a., based on years 2008/09 to 2029/30. Because all systems have optimum throughput rates, facilities may need to be designed for greater tonnage rates than strictly required in the early years of the LATs regime. Accordingly it may be necessary for deliver more waste to the processing facilities than is strictly needed to comply with landfill allowances.

(b) Additional facilities may be needed midway through the contract period. The length of the proposed contract and the uncertainty about waste quantities in future years suggests that contracts will need to be flexible to reflect the likelihood of significant tonnage changes during the contract period. This means that plants that can easily expand, with extra modules of processing capacity being added over time, are an attractive option. Alternatively it may be that different technologies are added over time as they become available at economic cost.

(c) Other more detailed graphical analyis shows there is a need for processing capacity from April 2009 although the exact date depends upon recycling performance and tonnage growth in advance of the anticipated long term contract starting date in about 2010; and

(d) That landfill contracts will be needed in the event that new processing capacity is not available by 2013.

The treatment capacity described will also have to enable the Council to comply with the targets outlined in Section 3. The analysis in Table H shows the levels of additional recycling and value recovery that the waste treatment facilities will have to achieve in order to meet these obligations.

TABLE H1, 2, 3 show contribution to recycling and value recovery targets from the proposed waste treatment capacity (assuming 1, 2 and 3% growth).

[70] Calderdale requires a 70/30 process or better by 2019/20.

Table H1 1% MW Growth

							Outputs from treatment plant			WS2000	
Year	Municp. waste	Recy. (see note 1)	Resid. waste	Lats allownc. in real terms	Net weight over allow.	Process cap. to treat waste tonnes.	15% recy.or comp.	65% Value recov.	20% Process residual to landfill	Predct. recyle rate	Predct. recover rate
2004/05	93,797										
2005/06	85,913	17,183	68,730	92,212	-23,481	0					
2006/07	86,772	17,354	69,418	86,856	-17,438	0					
2007/08	87,640	21,910	65,730	79,713	-13,983	0					
2008/09	88,516	22,129	66,387	70,787	-4,400	0					
2009/10	89,401	26,820	62,581	60,074	2,507	3,134	470	2,037	627	31%	33%
2010/11	90,295	27,089	63,207	53,387	9,820	12,275	1,841	7,979	2,455	32%	41%
2011/12	91,198	27,360	63,839	46,700	17,139	21,424	3,214	13,925	4,285	34%	49%
2012/13	92,110	27,633	64,477	40,013	24,464	30,580	4,587	19,877	6,116	35%	57%
2013/14	93,031	27,909	65,122	38,297	26,825	33,531	5,030	21,795	6,706	35%	59%
2014/15	93,962	31,007	62,954	36,581	26,374	32,967	4,945	21,428	6,593	38%	61%
2015/16	94,901	31,317	63,584	34,865	28,719	35,899	5,385	23,334	7,180	39%	63%
2016/17	95,850	31,631	64,220	33,147	31,073	38,841	5,826	25,247	7,768	39%	65%
2017/18	96,809	31,947	64,862	31,431	33,431	41,789	6,268	27,163	8,358	39%	68%
2018/19	97,777	32,266	65,511	29,715	35,796	44,745	6,712	29,084	8,949	40%	70%
2019/20	98,755	32,589	66,166	27,999	38,167	47,709	7,156	31,011	9,542	40%	72%
2020/21	99,742	32,915	66,827	27,999	38,829	48,536	7,280	31,548	9,707	40%	72%
2021/22	100,740	33,244	67,496	27,999	39,497	49,371	7,406	32,091	9,874	40%	72%
2022/23	101,747	33,577	68,171	27,999	40,172	50,215	7,532	32,640	10,043	40%	72%
2023/24	102,765	33,912	68,852	27,999	40,854	51,067	7,660	33,194	10,213	40%	73%
2024/25	103,792	34,251	69,541	27,999	41,542	51,928	7,789	33,753	10,386	41%	73%
2025/26	104,830	34,594	70,236	27,999	42,238	52,797	7,920	34,318	10,559	41%	73%
2026/27	105,878	34,940	70,939	27,999	42,940	53,675	8,051	34,889	10,735	41%	74%
2027/28	106,937	35,289	71,648	27,999	43,649	54,562	8,184	35,465	10,912	41%	74%
2028/29	108,007	35,642	72,364	27,999	44,366	55,457	8,319	36,047	11,091	41%	74%
2029/30	109,087	35,999	73,088	27,999	45,090	56,362	8,454	36,635	11,272	41%	74%

Note 1:
20% recycling between 2005/06 - 2006/07, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14, 33% thereafter.
1% growth in municipal waste
80% recovery from treatment
Recycling rate includes the recycling output from treatment along with actual recycling.
Recovery rate includes all recycling along with recovery output from treatment.

Table H2 2% MW Growth

							Outputs from treatment plant			WS2000	
Year	Municp. waste	Recy. (see note 1)	Resid. waste	Lats alownc. in real terms	Net weight over allow.	Process cap. to treat waste tonnes	15% Recy. or comp.	65% Value recov.	20% Process residual to landfill	Predct. recyle rate	Predct. recover rate
2004/05	93,797										
2005/06	85,913	17,183	68,730	92,212	-23,481	0					
2006/07	87,631	17,526	70,105	86,856	-16,751	0					
2007/08	89,384	22,346	67,038	79,713	-12,675	0					
2008/09	91,172	22,793	68,379	70,787	-2,408	-3,010	-452	-1,957	-602	25%	22%
2009/10	92,995	27,898	65,096	60,074	5,023	6,279	942	4,081	1,256	31%	35%
2010/11	94,855	28,456	66,398	53,387	13,012	16,265	2,440	10,572	3,253	33%	44%
2011/12	96,752	29,026	67,726	46,700	21,026	26,283	3,942	17,084	5,257	34%	52%
2012/13	98,687	29,606	69,081	40,013	29,068	36,335	5,450	23,617	7,267	36%	59%
2013/14	100,661	30,198	70,463	38,297	32,165	40,207	6,031	26,134	8,041	36%	62%
2014/15	102,674	33,882	68,792	36,581	32,211	40,263	6,040	26,171	8,053	39%	64%
2015/16	104,727	34,560	70,167	34,865	35,303	44,128	6,619	28,683	8,826	39%	67%
2016/17	106,822	35,251	71,571	33,147	38,424	48,030	7,204	31,219	9,606	40%	69%
2017/18	108,958	35,956	73,002	31,431	41,571	51,964	7,795	33,777	10,393	40%	71%
2018/19	111,138	36,675	74,462	29,715	44,748	55,934	8,390	36,357	11,187	41%	73%
2019/20	113,360	37,409	75,951	27,999	47,953	59,941	8,991	38,962	11,988	41%	75%
2020/21	115,628	38,157	77,470	27,999	49,472	61,840	9,276	40,196	12,368	41%	76%
2021/22	117,940	38,920	79,020	27,999	51,021	63,777	9,567	41,455	12,755	41%	76%
2022/23	120,299	39,699	80,600	27,999	52,602	65,752	9,863	42,739	13,150	41%	77%
2023/24	122,705	40,493	82,212	27,999	54,214	67,767	10,165	44,049	13,553	41%	77%
2024/25	125,159	41,302	83,857	27,999	55,858	69,823	10,473	45,385	13,965	41%	78%
2025/26	127,662	42,129	85,534	27,999	57,535	71,919	10,788	46,747	14,384	41%	78%
2026/27	130,215	42,971	87,244	27,999	59,246	74,057	11,109	48,137	14,811	42%	78%
2027/28	132,820	43,831	88,989	27,999	60,991	76,238	11,436	49,555	15,248	42%	79%
2028/29	135,476	44,707	90,769	27,999	62,770	78,463	11,769	51,001	15,693	42%	79%
2029/30	138,186	45,601	92,584	27,999	64,586	80,732	12,110	52,476	16,146	42%	80%

Note 1:
20% recycling between 2005/06 - 2006/07, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14,
33% thereafter.
2% growth in municipal waste
80% recovery from treatment
Recycling rate includes the recycling output from treatment along with actual recycling.
Recovery rate includes all recycling along with recovery output from treatment.

Table H3 3% MW Growth

							Outputs from treatment plant			WS2000	
Year	Municp. waste	Recy. (see note 1)	Resid. waste	Lats allownc. in real terms	Net weight over allow.	Process cap. to treat waste tonnes	15% recy.or comp.	65% Value recov.	20% Process residual. to landfill	Predct. recyle rate	Predct. recover rate
2004/05	93,797										
2005/06	85,913	17,183	68,730	92,212	-23,481	0					
2006/07	88,490	17,698	70,792	86,856	-16,064	0					
2007/08	91,145	22,786	68,359	79,713	-11,354	0					
2008/09	93,879	23,470	70,410	70,787	-377	-471	-71	-306	-94	25%	25%
2009/10	96,696	29,009	67,687	60,074	7,614	9,517	1,428	6,186	1,903	31%	38%
2010/11	99,597	29,879	69,718	53,387	16,331	20,414	3,062	13,269	4,083	33%	46%
2011/12	102,585	30,775	71,809	46,700	25,109	31,387	4,708	20,401	6,277	35%	54%
2012/13	105,662	31,699	73,964	40,013	33,950	42,438	6,366	27,585	8,488	36%	62%
2013/14	108,832	32,650	76,182	38,297	37,885	47,357	7,104	30,782	9,471	37%	65%
2014/15	112,097	36,992	75,105	36,581	38,524	48,155	7,223	31,301	9,631	39%	67%
2015/16	115,460	38,102	77,358	34,865	42,493	53,117	7,968	34,526	10,623	40%	70%
2016/17	118,924	39,245	79,679	33,147	46,532	58,165	8,725	37,807	11,633	40%	72%
2017/18	122,491	40,422	82,069	31,431	50,638	63,298	9,495	41,144	12,660	41%	74%
2018/19	126,166	41,635	84,531	29,715	54,817	68,521	10,278	44,538	13,704	41%	76%
2019/20	129,951	42,884	87,067	27,999	59,069	73,836	11,075	47,993	14,767	42%	78%
2020/21	132,550	43,742	88,809	27,999	60,810	76,013	11,402	49,408	15,203	42%	79%
2021/22	135,201	44,616	90,585	27,999	62,586	78,233	11,735	50,851	15,647	42%	79%
2022/23	137,905	45,509	92,396	27,999	64,398	80,497	12,075	52,323	16,099	42%	80%
2023/24	140,663	46,419	94,244	27,999	66,246	82,807	12,421	53,825	16,561	42%	80%
2024/25	143,477	47,347	96,129	27,999	68,131	85,163	12,775	55,356	17,033	42%	80%
2025/26	146,346	48,294	98,052	27,999	70,053	87,567	13,135	56,918	17,513	42%	81%
2026/27	149,273	49,260	100,013	27,999	72,014	90,018	13,503	58,512	18,004	42%	81%
2027/28	152,258	50,245	102,013	27,999	74,015	92,518	13,878	60,137	18,504	42%	82%
2028/29	155,304	51,250	104,053	27,999	76,055	95,069	14,260	61,795	19,014	42%	82%
2029/30	158,410	52,275	106,134	27,999	78,136	97,670	14,650	63,485	19,534	42%	82%

Note 1:
20% recycling between 2005/06 - 2006/7, 25% recycling by 07/08 & 08/09,
30% recycling between 2009/10 - 2013/14, 33% thereafter.
3% growth in municipal waste
80% recovery from treatment
Recycling rate includes the recycling output from treatment along with actual recycling.
Recovery rate includes all recycling along with recovery output from treatment.

Assumptions: - 25% recycling between 2006/07 - 2007/08, 30% recycling between 2008/09 - 20013/14, 33% thereafter
- 20% residue to landfill
- make maximum use of the landfill allowance

Comments

The scenario given above:

- accounts for all MSW arisings;
- meets the 2005/06 WS2000 recycling target for Calderdale of 18%;
- uses landfill allowances so that their net numerical effect is neutral[71];
- maximises the use of landfill allowances each year to eliminate net weights over allowances;
- anticipates the inevitability that certain processed MSW will not be suitable for further waste treatment and that it will need to be landfill;
- delivers significant quantities of treated wastes with additional process based recycling and recovery.

6.5 Other Appraisal Criteria

The following criteria will need to be considered in any option appraisal together with the output specification described above.

Environmental

- Land availability
- Land take - area needed.
- Land use – of existing brownfield land back into use.

- Emissions to atmosphere - e.g., the level of individual chemical emissions, ozone depletion, greenhouse gas emissions.
- Emissions to water - e.g., the discharges to sewer.
- Amenity issues – the noise, dust, litter, and visual impact.
- Transport impacts – the transportation distances.
- Resource consumption – the power and water needed to operate a facility.

Socio-Economic

- Local employment – the possibility of creating new jobs using new technologies to operate waste management facilities.
- Local training – the availability of infrastructure to improve the skills base to achieve the above.
- Inward investment into the local economy – that is the capital needed to construct a waste management facility.

[71] For example from table H3 3%, 2008/09: (Residual Waste 76981 – Process Capacity 7743) + 20% Process residual waste to landfill 1549 = Lats Allowance 70787.

- Operational benefits to local economy - benefits of ongoing operation, e.g., sustained job creation, and local markets for recycling/composting etc.

Cost

- Is the solution affordable and does it represent value for money?

Overall Acceptability

- to the public
- to the Members of the Council
- to the planners.
- to the Environment Agency.

6.6 Other Considerations

It is likely that the following issues will need to be considered depending on the desired shape of any procurement exercise and proposal from bidders in response.

Scope

Some bidders will wish to include the refuse collection service (including recycling collections), operation of HWRS, operation of bring sites, plus possible transfer stations and associated transport, others will only wish to deal with the disposal stage of the waste management process. (See page par. 5.6 page 67)

Bidders may wish to improve or develop HWRS's to improve recycling rates and enable WEEE to be recovered.

The waste arising from the actual processing, the so called **process residual waste,** which may need to be landfilled, and other wastes not suitable for treatment (e.g., HWRS waste) that require landfilling may be in or out of the contract scope.

Partnership

The Council has been exploring possible joint working arrangements with neighbouring authorities. The conclusion of these are that whilst there may be possible synergies, only Bradford is at a similar stage of development with its procurement process. Calderdale has made a formal request to explore the possibilities of joint collaboration with Bradford's future procurement process. Clearly a shared waste treatment facility located to the south of the Bradford district (e.g., at Bowling Back Lane, Bradford), capable of receiving waste tonnages delivered by Calderdale, would be an attractive option for the Council.

Partnership working should offer economies of scale because of greater quantities of waste, using a larger sub regionally based facility. Risks of such partnerships could cause delays in requiring partners to "sign up" to any new contract. Any sub regional facility developed outside Calderdale would require continued use of

our existing transfer loading operations to deliver to a distant but nearer facility, and therefore should reduce costs

Scenario Fit

Certainly consideration needs to be given to how any proposal fits with existing service provision or arrangements. Is it complementary, does it enhance existing operations, or will it have adverse impacts, and therefore hidden added costs (e.g., the location of any new disposal facility may require revisions to existing refuse collection vehicle routes when considering the most economical delivery schedule to the new facility)?

Current refuse collection arrangements are based on two operating or collection centres, (Halifax and Eastwood/Todmorden). Contractors may suggest other options although unlikely[72] based on a single site which could:

1. be located centrally within the Borough (although no land is offered by the Council that would facilitate this);

2. be external to the Borough in which case some or all of the transfer loading network would be needed; or

3. be based on the two existing sites, requiring the retention of the two transfer loading stations so requiring waste to be transfer loaded in from the existing transfer stations, to a new facility within or without the Borough).

Timing

Can the waste treatment solution be **delivered on time?** The Government's targets in 2010 and 2015, rises in landfill tax peaking in 2010/11 and the reductions in the allowed biodegradable content of waste sent to landfill; with target dates in 2010, 2013 and 2020, require that any alternative waste treatment option for Calderdale need to operational by April 2009 or by 2010/12 at the latest. If the procurement process cannot deliver facilities by this date, then there is a significant risk of failing to meet the LATs targets and incurring the costs of large LATS fines as a result. The only other mitigating strategy that could be adopted in this situation would be to purchase LATs allowances from the market, currently at £20/£24 p.t.[73]

Transfer of Undertakings, Protection of Employment

The scale of any TUPE rights will depend on the scope and type of the procurement, and thus how many staff if any would need to transfer to any successful bidder. If the present model is retained, that is an un-integrated contract structure with separate contracts for landfill, collection and household waste sites, and new company provided disposal facilities either shared or wholly utilised by this Council; then the

[72] Because of Calderdales valley topography.
[73] On 18/01/06

need for TUPE transfers will be non-existent. Any change of collection contractor during 2008, if it occurs will result in TUPE negotiations between contractors.

6.7 Constructing a Cost Model

With the exception of mass burn incineration, which has an existing track record within the UK, predicting costs of other waste treatment options is difficult. New technologies such as autoclaving have, as yet, no track record in the UK, and therefore understanding their capital set up and operating costs is more speculative. Many of the alternative technologies, including MBT, require markets for the treated MW e.g., autoclave floc or BMT SRF, which in the UK are not well developed. Therefore it is difficult to predict whether outputs such as floc and SRF will be a net income or net cost.

However, the following is considered as a guide as to the Council's waste in 2010, and can be used to evaluate whether any proposed bids represent value for money, as part of the overall options appraisal.

Future landfill costs used to indicate base crossover costs to new disposal methods

The likely future costs of landfill can be used as a reliable guide to competitive waste treatment costs. Appendix 4 indicates the expected gate fee for landfill disposal, including landfill tax. The spreadsheet shows that by 2010 gate fees[74] will be approximately £43[75]/tonne rising to £52/tonne by 2020. Landfill tax is expected to peak at £35/tonne in 2010/11 although it should be remembered that there may be a review and revision upwards of the Landfill Tax rate in 2007. Within limits, the landfill cost per tonne can, therefore, be taken as an indicator of the point at which the landfill gate fee achieves parity (or indeed starts to become more expensive) than alternative treatment and diversion options.

LATS Fines used to indicate the maximum crossover costs to a new disposal method

During the introduction of LATS, Defra suggested that the fine of £150 is based on the premise that this value represents twice that of the most expensive waste treatment technology. Thus the most expensive waste treatment option must be deemed to be about £75/tonne.

Target Price

Taking 2010 as the probable inception year for any new waste treatment contract, the procured "target" price per tonne should therefore be within the range of £43-75/tonne. Energy from waste (for a typical plant of around 200,000 tonnes/p.a. capacity on a 25 year contract) suggests a price at the lower end of this scale, of £45/tonne (2005 prices).

[74] Excluding any LATs.
[75] Data Monitoring Officer- Based on our current contract landfill price indexed at 2% p.a. and assuming 3% waste growth, 20% recycling 2005/07, 25% recycling 2007/08 and 2008/9, and 30% thereafter.

7.0 OPTIONS SELECTION

7.1 Summary

From the information provided in Section 6, a number of key points become clear:

- waste management costs are going to rise significantly in any event;(see pages 69,70)
- do nothing is not an option - as it will be both the most expensive cost option and will fail to meet all targets;
- the Council will need to procure a long term contract for its municipal waste management to satisfy all long term targets;
- the soonest any long term contract can commence is 2010;
- the Council is likely to meet its LATs and nationally set recycling targets up to 2009, but needs to maintain or better its projected position.
- Any short term waste treatment opportunities that occur between 2007 and 2010, involving significant diversion of tonnages away from landfill, at economic cost[76] should be implemented as soon as practicable
- A landfill contract(s) beyond present contractual breakpoint of 31.07.13 in the case of the remaining primary landfill contract will need to be secured after the start of the long term disposal contract in about 2010, to deal with any residue from the adopted disposal process and to act as the last resort backup disposal option should the process or output markets temporarily

Best Technology

It may be expected that this Waste Strategy will recommend a “best new technology” to use for the diversion of Calderdale’s excess residual waste. The fact that this Waste Strategy does not explicitly and repeatedly do this, may be taken immediately by some, that the analysis is in some way faulty, illogical, or lacking in rigour or completeness.

In answer to this objection it should be acknowledged that Calderdale has already subjected its waste management problems to an analysis using the BPEO process, by using Eunomia Research & Consulting during 2005. This study supplied the view that no best technical solution necessarily exists in all cases. Eunomias conclusion on the best technology available to Calderdale is attached to this document Appendix 7. Eunomia examined the issues in this specific section under the following headings:

- Which Technology Performs Best?
- Scale
- Planning Issues
- Procurement Lead Times
- Costs
- Key Operating Decisions
- Reliability

[76] See page page 70.

Clearly research by independent specialist consultants and advisors to central government at DEFRA must be taken seriously and incorporated into the structure of Calderdale's Waste Strategy and influence the outcome whilst still allowing local conditions and circumstances to have their own due consideration.

Commentary on Eunomia's View

15.0 Conclusions: Appropriateness for Calderdale

Which Technology is "The Best" on Technical Grounds?

Rightly Eunomia's view is that no technology is explicitly "the best" technology in all circumstances for the following reasons:

- Most technologies perform well in one or more categories, but less well in others, for example some may only give extreme volume reduction as is the case with incineration, others may give increased recycling performance as in the case of say a sophisticated MURF;
- Thus making a decision depends upon what different individuals or authorities regard, or need as the most important outcome of a Waste Strategy. Some authorities because of severe cost constraints, will be cost led, whilst others taking a different political viewpoint under the guidance of Councillors will consider and give greater emphasis by increasing above the norm, the environmental, social, and employment aspects of a Waste Strategy.
- Air emission impacts can vary from place to place, clearly authorities in Calderdale's position being largely comprised of interconnected valley systems have to give greater concern to wind blown emissions than authorities close to depopulated coastlines that exist along the southern boundaries of for example the Humber estuary.
- Perhaps most importantly of all is the comment that ".... *as far as several of the technologies identified above are concerned, the performance varies importantly from one process design to another. For this reason, it is becoming increasingly difficult to speak in general terms about the performance of a 'type of technology' since performance variation within any group may be significant. This is likely to be less true of more mature technologies, such as incineration and landfill, than it is for the newer processes, notably the ATT systems and the AD-based MBT systems, where relatively few suppliers can claim to have established their processes as fully reliable. However, even at landfills, leachate treatment systems vary in their ability to reduce the loading of effluent discharged into surface waters."*

Such views from a major consultancy such as Eunomia justifies the later recommendation in this Waste Strategy to use a jointly acquired output based contract. It could be added that examination of the Environment Agencies independent and unbiased Waste Treatment Technology Data web site reinforces this view, as commercial companies have failed to supply robust and verifiable information as to how well their particular systems perform. Whether or not this important deficiency will ever be rectified without legislation is a matter of conjecture and not fact. Clearly if

clear plant performance data is not made available to local authorities, then the only logical step local authorities can take is to use performance output related contracts.

Scale

Here again the quantities of residual waste available in Calderdale for treatment impinge adversely on the authorities ability to secure an economic and least cost solution to residual waste diversion for example Eunomia comment " *Generally, the issue of scale appears to rule out typical grate incinerators if Calderdale intends to procure its own facility. Of the more conventional combustion technologies, the Cyclerval process stands out as being potentially more appropriate to Calderdale. .....*" and again they discuss possible partners "*A fluidised bed incinerator (FBI) could also be considered, though since this would require some pre-treatment of waste, it may be more sensible to combine the use of a basic MBT system with the FBI. In this case, it would seem an interesting option to explore the potential for construction of an FBI in the region to serve more than just Calderdale. The potential to partner with Bradford would be interesting from this perspective. However, the partnering process is likely to involve considerable time. ....*"

Eunomia then discuss an ideal tonnage solution....

"*For most MBT systems based around aerobic treatments, the sort of scale being sought by Calderdale is around the optimal size shows that this type of capacity is far from unusual for MBT plants. Indeed, the average size for the German facilities listed is around 70,000 tonnes*" and suggest and aerobic MBT system of treatment, although for Calderdale alone, a **70,000 t.p.a. plant in 2010 would be far too big**.

They then produce a hierarchical list of prioritised scale options some of which are discounted elsewhere in the study as impracticable but containing priority option 5 Aerobic MBT their ultimate preferred option:

"*It seems likely, therefore, that scale favours:*

1. *Oscillating kiln;*
2. *ATT;*
3. *Aerobic MBT (for RDF coupled to ATT/ FBI)*
4. *Simple AD-based MBT; and some recycling extraction*
5. *Aerobic MBT (for stabilisation only)*
6. *Autoclave, but coupled to other systems.*"

This list contains a number of options, the interesting points being that options 1 to 4 can be discounted for planning reasons, degree of risk, legislative uncertainty, and "blue sky" technical objections, hence only aerobic MBT for stabilisation only and autoclave remain. These two methods may be available jointly with Bradford in the near future with option 6 being entirely by fortuitous co-incidence.

However the two most important facts about scale are that Calderdale's tonnage compared with other adjacent authorities is tiny, and that by joint working across local borders a better scale of tonnage can be coalesced, enabling both authorities to get

economies of scale. Also in the case of some technologies have enough joint tonnage available to make the actual process a viable option to choose.

Planning

Here Eunomia discuss the likelihood of obtaining planning permission for a waste disposal facility and point out that some facilities such as aerobic pre-treatment prior to landfilling are more likely to get planning permission than others. They also note that no site is designated in the UDP for a waste disposal facility, a situation that will be rectified during the spring of 2006, and again they comment that an aerobic pre treatment prior to land filling has a high prospect of success. The current uncertainty about the availability of land within Calderdale for any waste disposal facility lends support to the need to seriously consider joint working with a nearby authority such as Bradford where land due to the variable of topography between Calderdale and Bradford is more likely to be available.

Lead Times

Time is short for Calderdale as it is for most authorities because of the looming LATs penalties, therefore time for consultation, planning, procurement, permitting, construction and testing is at a premium, although some time can be saved by carrying out certain processes in parallel. Eunomia state that at least 4 years is required to obtain some kind of new facility. Clearly any joint venture working with another authority has the potential to increase lead times unless agreement can be reached quickly as to procedures and the apportionment of procurement costs. Hence there is a need not only to try and "buy" extra time but to have a fall back position should joint working fail for some as yet unknown reason. In addition the difficulties of joint working could cause the time scales for joint provision to expand over those needed for single, lone authority procurement, hence the need to "grab back" time becomes a clear policy imperative or legitimate waste strategy tactic.

Thus lead times and the need to "buy" extra time further support the tactic within the Waste Strategy of reconfiguring the collection system so as to provide an increased quantity of recyclate collected, and to extract more recyclate from the wastes deposited at the HWRS. This should be done urgently. This policy and our foregoing comment is supported by Eunomia under the lead times heading where they state "*From where Calderdale is today, our view is that a time period of at least 4 years is likely to be required, and probably longer, even for relatively simple facilities. For more complex ones, the period would most likely increase to around 6 years on an optimistic timescale.*"

And further where it is said

"*This implies that Calderdale is unlikely to have a facility in operation prior to 2010/11. By this time, unless Calderdale has implemented quality collection systems for dry recyclables and biowaste, and has reconfigured its HWRCs (and possibly put more of them in place), Calderdale will be fairly deeply in the red in respect of its LATS balance.* "

The last paragraph in Eunomia's section on lead times included below also raises the issue of Environment Agency consultations on biodegradability! This issue is by no means complete in the sense that providers of process plant have yet to provide the EA with data on biodegradability for inclusion on the Waste Treatment Technologies web site. It should be noted that there is no statutory requirement for them to do this, so the eventual availability of the data is open to question. I quote and (our bolding) "*Simpler facilities are therefore likely to have more to recommend them than more complex ones.* ***Subject to Environment Agency consultations agreeing that the outputs might be considered to have lost most of their biodegradability****, basic stabilisation processes may have much to recommend them. Equally, those facilities likely to be most problematic in the planning process, especially incinerators and ATT facilities, are likely to be least attractive.*"

It is important to note that in addition to "buying time" for consultations, planning, procurement, permitting, construction and testing, Calderdale is also getting more time for new waste processes to evolve, and legislation to settle down, or in some cases be on the statute book. Secondly, and more directly, and simply, Calderdale would be extending the 4 year time frame or window, before its access (however achieved) to a new waste diversion facility becomes an essential policy requirement to avoid LATs.

It is noteworthy that this stratagem of "buying time" is a further evolution of Calderdale's existing Waste Strategy which could be summarised under the heading of "Wait and see until things become clearer". Clearly though more form and substance is being adopted in this, the update on the existing strategy.

Costs

Eunomias view is that costs will depend upon the attractiveness or otherwise of Calderdale's contract to contractors the so called "Bankability" factor, Eunomia state "*The costs to the Council of a given contract will in part reflect the risk perceived by bidders of entering into the contract. Furthermore, the more attractive the Council makes itself to bidders, the more competitive the process will be and, other things being equal, the lower the price paid.*"

And further "*If the Council has such a site in its possession, this would eliminate much of the* ***perceived problem associated with bidding for what is inevitably going to be a small contract compared with many others being let at the same time****.*" Thus two factors are introduced that of site availability, and the size in tonnage terms of Calderdale's contract. Both factors are not auspicious for Calderdale acting alone hence yet more reinforcement of the need to obtain a joint working solution.

Eunomia's view is that no option will cost the authority much less than £60 per tonne. This is a figure borne out by our own analysis earlier in this Waste Strategy document, thus if we wish to constrain costs we need to improve the "Bankability" of our contract needs. This can be achieved by having access to suitable land with planning permission, at a scale of tonnage that is attractive to waste disposal contractors who will be in a position to choose or not choose a particular authorities contract tender.

Key Risks

No new waste disposal option is without risk, and the subject of risk in the waste disposal context is addressed later in this document in a theoretical way for the complete understanding of readers. However it is again interesting to note that Eunomias view co-insides with that of Calderdale waste disposal officers with respect to risk. Thus (our bolding).

"***It is notable how many of these risks reflect the fluidity of the policy / legislative environment**. **No technology will be without its risks in this regard**. Those non-landfill treatments for which the framework seems most stable – such as incineration – are likely to be those which are least popular and give rise to planning delays. **Those likely to be more acceptable still have questions surrounding how they will be treated under the LATS, but this is unlikely to remain the case for too long**.*"

Picking up on the last statement is true that the situation is slowly becoming clearer, however we still do not know for sure the biodegradability we can expect from most commercially available systems. Nor is the position of SRF fully worked out, or the exact acceptability and commercial status of compost produced to the PAS 100 system. We do know the E.A.'s view on the outputs from MBT systems and their likely last resting place, and the official view appears to be that the opportunities for spreading the outputs to land for the lower grade material are at best limited.

Contribution to Recycling Rates

Waste diversion processes contribution to recycling rates vary and Eunomia state that " *The less familiar treatments are more likely to lend themselves to contributing to recycling rates*."

By less familiar treatments Eunomia means ATT and the like.

Reliability

The "Bankability" factor already referred is influenced by process reliability. We are warned by Eunomia to be wary of forceful marketing of instant waste disposal solutions further justification for a joint output based Waste Strategy. Their warning is stark.

"*In an environment where many technology suppliers are marketing their technologies especially forcefully, the term Caveat Emptor applies with particular force. Potential buyers of equipment must be careful to ensure that what they are getting delivers what the supplier claims, and that fundamentally, the technology is sufficiently reliable to operate continuously without interruptions other than those for planned-in routine maintenance. In this context, the somewhat awkward term 'proven technology' has acquired great significance. Not just because local authorities need to be assured that the equipment they procure will work; but because financial backers, to the extent that they are at all risk averse, will simply not support projects which carry significant technology risk.*"

Again for the reasons outlined above an output based contract is the most obvious solution particularly with regard to supplier claims, reliable continuous operation, downtime, and the need to acquire what is termed proven technology. Local authorities cannot be sure with the present state of the process plant supplier market, and the data it is apparently willing or able to supply, what individual plant performance actually is.

The following passage from Eunomia's Calderdale BPEO study outlines fully the reliability issues of various treatment processes, and the present state of affairs. Clearly running through the commentary is the issue of confidence from the banks, the local authorities, and the waste disposal companies.

"*Partly for this reason, one senses, in the waste management community, the tide turning once again towards technologies which are tried and tested. As far as the United Kingdom goes, the key alternative to landfill residual waste treatment has been incineration. New contracts involving mechanical biological treatment, as well as the fact that well over 70 plants already operate in mainland Europe, would suggest that this technology is now also here to stay. Variants using both aerobic and anaerobic technology are already being developed.*

As far as gasification and pyrolysis are concerned, there appear to have been greater problems in giving sufficient confidence to both local authorities and would-be financiers. Evidently, some suppliers who already have commercial scale facilities up and running in other countries may perceive this, and not without good reason, as unfair.

Autoclaves are beginning to attract the attention of local authorities, but autoclaves in themselves will need to be coupled to other technologies in order to offer a complete treatment. Merely heating biodegradable wastes will not render those wastes 'no longer biodegradable'. For that reason, some form of additional treatment for what will be the majority of the input feedstock will be required in order to give confidence to local authorities that they will not remain exposed to the landfill permit market. There remains some uncertainty as to whether or not the materials produced by the process will have the requisite qualities which make them suitable for one or other treatment, and at what cost.

In the midst of this ongoing development in what is an increasingly colourful scene, DEFRA has instigated the new technologies programme as part of the waste implementation programme. Part of the new technologies programme involves the instigation of demonstrator projects. These projects will focus on technologies not currently in use in the UK. As such, there is significant potential for some of those technologies described above to be scrutinized more closely, possibly giving greater confidence to local authorities and financiers where the projects demonstrate the technologies to be reliable."

Eunomia Summary

For information Eunomias complete summary follows below, the questions are now answered in and by this Waste Strategy. Calderdale is partnering with another

authority Bradford, the Waste strategy is laid out by this document, and the Waste Development Framework will designate sites for waste disposal.

"In short, there is not enough information yet available for a final decision to be made regarding the best treatment for residual waste in Calderdale. The matters, which urgently need to be considered, are:

1. ***Will Calderdale partner with any other local authority?***
   It is critical to have an early answer to this question since without a clear decision, the procurement process cannot get underway in a meaningful manner since no one knows who is going to procure the facility. The procurement process could have started – at least in outline form – some months ago had the decision been made to partner, or not, with other authorities;

2. ***What will Calderdale's waste strategy be?***
   Unless there is a clear idea of how to approach the issue of waste management in a strategic manner, no one can confidently say what size of facility, and of what type, is appropriate for Calderdale. It could be, at one extreme, that Calderdale opts for continued landfilling and paying the market price for permits. We would not advise this, but it remains a possibility. It could be that Calderdale plans for no improvement in source segregation in the future. We would not advice this, but it remains a possibility. The lack of decisions of this nature means that the number of sites, and their size, is only dimly known at present. Calderdale needs a waste strategy. This needs to be developed in consultation with citizens in the spirit of outreach. Once again, this process could have been started some months ago;

3. ***Will the Waste Development Framework designate new sites?***
   At present, the approach appears to be to wait for the RSS to come forward with improved data on wastes needing to be managed. However, there is no point in prevaricating where the identification of potential sites is concerned if, for example, it becomes clear that Calderdale is not going to simply 'continue landfilling' and seeks an alternative management route for residual waste;

4. ***What approach will Calderdale take to procurement should it choose to procure its own facility, and what will be the implications for financing?***
   This question needs to be considered in the context of the previous questions. The answer has implications both for scale and financing (and potentially, technology choice).

   The majority of these questions have received, as yet, no clear answer. It is worrying that decisions which need to be made are not being addressed with the degree of urgency they warrant. This means that the most valuable resource available to Calderdale at present – time – is fast disappearing. The implications will be that other resources – finance – may need to be drawn down to a greater extent than was necessary. We believe these questions need to be addressed urgently.

   In the absence of answers to these questions, we have drawn up a basic summary table (Table 1) which, in truth, does not do justice to the range of technologies available, or the complexity of the issues which it seeks to summarize.

The Table suggests that:

- *In the round, a treatment such as **aerobic stabilisation as a pre-treatment to landfilling** may have much to recommend it. It is technologically simple, it has low capital costs, and it should be capable of fairly swift construction. The key risk at the time of writing relates to the Agency's assessment of the process outputs in terms of their biodegradability. A final decision on this matter is expected shortly. Another issue of relevance to Calderdale may be land-take requirements;*

- *Less land is likely to be required by **AD-based MBT facilities generating a stabilised biowaste**. Furthermore, more material is extracted for recycling and the environmental performance of the system is thereby improved considerably. However, the cost of such systems, especially at the scale under consideration, may be relatively high, especially if a high contribution to recycling is sought. The other issue is (as for aerobic stabilisation) the treatment of the residues under LATS;*

- *A treatment such as **autoclaving** may fare well. However, autoclaving is not 'a process' in and of itself. It needs to be coupled to other technologies, and there is still some uncertainty about how well the process will work at higher throughput of mixed residual wastes. Questions therefore remain about where the biomass output would be sent, and for what purpose;*

- *If time is of the essence, probably, **ATT and incineration** are not the best to consider since they are likely to take longer to construct and are more likely to lead to planning delays. The wisdom of considering either ATT or oscillating kiln technologies looks more questionable as time passes;*

- ***Facilities generating RDF** are, in the short- to medium-term, almost certainly dependent upon the existence of dedicated facilities to accept the output (because of the existing legislation covering co-incineration). As a result, these processes suffer the same problems in respect of time as do ATT and incineration unless a suitable facility can be found elsewhere;*

- *Obviously, **untreated landfill** has certain attractions. It is not about to 'go away'. It is, however, no longer a cheap strategy. Indeed, if Calderdale does not act, then it is likely to become a most expensive strategy.*

Table 1: Summary Assessment of Performance

	Cost / Scale	Planning	Lead Times	Costs	Key Risks	Recycling Rates	Reliability
Untreated Landfill	✓✓✓	n/a	n/a	✓✓	✓✓✓	n/a	✓✓✓
Incineration	✓	✓	✓	✓	✓✓✓	✓	✓✓✓
ATT	✓✓	✓	✓✓	✓✓	✓✓✓	✓	✓✓
Landfill after pre-treatment	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓	✓✓✓
RDF Biodrying	✓✓	✓✓✓	✓✓✓	✓✓	✓	✓✓	✓✓
RDF Through splitting	✓✓	✓✓	✓✓✓	✓✓	✓	✓✓	✓✓
AD based MBT	✓✓	✓✓	✓✓	✓	✓✓	✓✓✓	✓✓
Autoclaving	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓

Our view is that decisions would ideally be finalised through consultation with citizens in the context of the development of a wider strategy".

16.0 Eunomias Recommendations

We include Eunomias recommendations below, note the comment "....*The emphasis in service provision needs to shift from the provision of refuse collection with low frequency recycling services, to the provision of high quality collection systems for recycling and composting, preferably with reduced frequency collections for refuse. The current system, principally focused on how to manage refuse, would change into one where residual waste quantities are reduced, and resources are extracted for useful purposes from the waste stream (in line with what is suggested in the RWMS)....".*

Clearly we have again the suggestion that something must be done about the collection system, for reasons already covered earlier in Section 3 Need for Change on page 33 of this Waste Strategy and also in this section at the bottom of page 9 and the top of page 10. Joint procurement with Bradford is recommended by this Waste Strategy which should solve the site acquisition question. Projected waste tonnages are reasonably well known and will be dovetailed in with Bradford's requirements to produce an aggregated total tonnage, which should prove attractive to contractors. LATs planning will be considered alongside our commitments to Bradford during the procurement process. The question of the identification of waste management sites within Calderdale will be addressed during early 2006, as such identification will be required as part of our backup planning to cater for any future waste growth, and processing capacity that may be needed within the Borough.

We note the suggestion that:

> "*Waste managers and waste planners should work together to identify sites with a view, potentially, to securing them in future. This applies not only to residual waste treatment options, but also to HWRCs and to biowaste treatment facilities (composting or anaerobic digestion);*"

This is and will continue to be done as the "backup" plan for the Waste Strategy require that site(s) be identified within Calderdale to facilitate the need for sites should they be needed. Even if sites are not needed immediately it is likely that as the waste burden grows, the joint working arrangement may lead to the organic growth of sites within the Borough of Calderdale to satisfy clear partnership ideals with our colleagues in Bradford. Eunomia comment.

On the basis of the work undertaken, the following recommendations are made:

- ***Calderdale Urgently Needs to Develop a Waste Strategy to Guide its Progress in the Coming Years***
  The existing configuration of services in Calderdale reveals a (historic) lack of emphasis on recycling and composting, and a continuing over-reliance on landfill. The net disposal cost is currently of the order £44 per tonne. This figure will increase in future and is likely to exceed £60 per tonne in the next decade. The emphasis in service provision needs to shift from the provision of refuse collection with low frequency recycling services, to the provision of high quality collection systems for recycling and composting, preferably with reduced frequency collections for refuse. The current system, principally focused on how to manage refuse, would change into one where residual waste quantities are reduced, and resources are extracted for useful purposes from the waste stream (in line with what is suggested in the RWMS). We have tried to develop the bare bones of a strategy in this document and we hope it provides a basis for such a strategy. However, any strategy needs to be shaped by the views of citizens, and to have the commitment of Members so that officers are empowered to deliver it;

- ***Some Critical Questions Needs to be Answered as Soon as Possible:***

  - ***Will Calderdale partner with any other local authority?***
    It is critical to have an early answer to this question since without a clear decision, the procurement process cannot get underway in a meaningful manner since no one knows who is going to procure the facility. If there is to be no partnering, then there is no option but to ensure that sites are designated through the waste development framework. If partnering is an option – and the decision must be made now as to whether it is or is not – then the implications for sites, facility choice and likely timing of the commissioning of the facility need to be (re-)considered;

What are the implications of Calderdale's waste strategy (see above) for the quantity of residual waste to be treated?
Unless there is a clear idea of how to approach the issue of waste management in a strategic

manner, no one can confidently say what size of facility, and of what type, would be suitable for Calderdale … thus the unknown, and the unproven, are seen as being the chief obstruction to the adoption of new waste disposal technologies. Eunomia comment.

> *There are many different routes which the Council could, in theory, follow. In practice, however, it seems to us that the one obvious one is to procure services for Calderdale within Calderdale. Currently, the failure to make that decision is leading to loss of time and also to a lack of decision-making more generally. Calderdale's destiny is, it would appear, in its own hands. Unless there are obvious reasons for not arriving at that conclusion, there is no good reason for not accepting that as the reality;*

- *IF Calderdale accepts that the reality is that it must procure its own services, we would argue that:*
    - *Given the LATS situation potentially unfolding; and*
    - *Given the time which procuring such services is likely to take, then the following considerations are likely to be relevant:*
    - *In the round, a treatment such as **aerobic stabilisation as a pre-treatment to landfilling** may have much to recommend it. It is technologically simple, it has low capital costs, and it should be capable of fairly swift construction. The key risk at the time of writing relates to the Environment Agency's assessment of the process outputs in terms of their biodegradability. A final decision on this matter is expected shortly. Another issue of relevance to Calderdale may be land-take requirements;*
    - *Less land is likely to be required by **AD-based MBT facilities generating a stabilised biowaste**. Furthermore, more material is extracted for recycling and the environmental performance of the system is thereby improved considerably. However, the cost of such systems, especially at the scale under consideration, may be relatively high, especially if a high contribution to recycling is sought. The other issue is (as for aerobic stabilisation) the treatment of the residues under LATS;*
    - *A treatment such as **autoclaving** may fare well. However, autoclaving is not 'a process' in and of itself. It needs to be coupled to other technologies, and there is still some uncertainty about how well the process will work at higher throughput of mixed residual wastes. Questions therefore remain about where the biomass output would be sent, and for what purpose;*
    - *If time is of the essence, probably, **ATT and incineration** are not the best to consider since they are likely to take longer to construct and are more likely to lead to planning delays. The wisdom of considering either ATT or oscillating kiln technologies looks more questionable as time passes;*
    - ***Facilities generating RDF** are, in the short- to medium-term, almost certainly dependent upon the existence of dedicated facilities to accept the output (because of the existing legislation covering co-incineration). As a result, these processes suffer the same problems in respect of time as do ATT and incineration unless a suitable facility can be found elsewhere;*
    - *Obviously, **untreated landfill** has certain attractions. It is not about to 'go away'. It is, however, no longer a cheap strategy. Indeed, if Calderdale does not act, then it is likely to become a most expensive strategy.*

Calderdale needs to act quickly to deliver quality services to its citizens and to avoid the possibility of heavy costs / fines arising though failure to act in response to the LATS.

7.2 Selection

Short Term

From 2009/10 onwards the Council will be vulnerable to LATs penalties and this situation will continue until the procurement of a major diversion method is obtained and put in place. Therefore it requires quickly implemented short term solutions to fend off financial problems for as long as possible, or certainly until such time as the chosen diversion method is up and running.

Action needs to be taken, such as continued intervention, to influence the recycling rates to achieve the proposed recycling rate of 25% for 2007/08 and up to 2008/09 & 30% in 2009/10. This will help to maintain the projected financial position with regard to LATs. Any enhanced recycling performance above intended targets would buy more time for waste management infrastructure changes and at the same time reduce the Council potential exposure to LATs fines.

The recycling rate is now a national priority Best Value Performance Indicator and will influence the Council's Comprehensive Performance Assessment score. Although the judgement in 2006/7 will be based on performance in 2005/6 (which is for all purposes fixed) a positive direction of travel will help the overall judgement.

Having considered the above then our recommended actions for the future is:

a) continue with the waste awareness campaign, and for our already in place kerbside collection consider increasing the range of recyclate collected.

b) make determined attempts to improved the recycling rate at our HWRS where an unusually large percentage of our MW arisings come from, this will involve substantial negotiations with FOCSA. These improvements will make use of the data from the Calderdale Household Waste Site Design and Management Study 2005 to bring about the necessary marked increase in performance.

c) reconfigure the waste collection service in line with the recommendations given by Eunomia and the findings discussed in section 3.5 Waste Collection page 46 of this Waste Strategy. Briefly Calderdale should move from the provision of a black bag system, to a system giving the householder a choice of storage options (wheeled bin or black bag) for residual waste presented for collection at the curtilage, subject to health and safety considerations for those who by reason of incapacity are unable to present at the curtilage, an assistance scheme will be available.

d) the introduction of alternate weekly collection system, this means the collection of residual waste in week 1 and the recyclate in week 2.

e) The number and size of residual waste containers provided at each household to be reasonable, as legislation requires and based on household occupation.

f) new waste treatment technologies may be available to the Council within the next few months/year, in close proximity, which may offer good landfill diversion opportunities at economic rates. Therefore it would be sensible to consider each opportunity as it comes along between 2007 and 2010, involving significant diversion of tonnages away from landfill, at economic cost[77]. Any process achieving additional recycling, and diversion away from landfill would be appropriate. Such a short term measures could be extended should the contracted process prove capable of delivering the diversion tonnages required in the future.

g) establish a Project Team to deliver both the joint procurement of a disposal option with Bradford and put out to tender waste collection and recycling contract(s), to replace the existing arrangements

h) having regard to the significant quantities identified as available in the analysis, consider the introduction of a pilot scheme to collect compostable kitchen waste and direct it to a suitable facility. This pilot to test the public acceptability and cost effectiveness of delivering a Borough wide service.

Long Term

The long term contract will be more complicated to procure and therefore take longer to achieve. This process needs to commence during 2006.

Such a contract will have the following characteristics:

- have a start date of April 2010 at the latest;
- will deal with all the Council's Municipal Waste jointly Bradford;
- have a contract period of 25 years duration, the contract period should match the design life of any new facility;
- the contract will also define the ends but not the means: it will not specify waste technology solutions, but will be based upon an output based specification which will meet specified recycling targets in WS2000 and the EU Landfill Directive, yet maximising disposal tonnage to landfill but in compliance with LATS;
- will allow for flexibility in scope, ranging from a single plant, to which the Council delivers waste, through to the contractor operating other waste related services, such as HWRS, refuse collection, and residual waste disposal to landfill;
- will place as much risk as is reasonable and cost effective to do so onto the contractor;
- will suggest that such an output based specification, of this scope and risk allocation will require a design, build, finance, and operate contractual solution. The funding vehicle will therefore be one which suits a DBFO contract, typically

[77] See page page 70.

either PFI or PPP, which will in turn dictate the type of procurement undertaken;

- will allow for the development of contractual solutions involving joint working with Bradford;
- will adhere to the proximity principal, and as a backup or contingency solution, allow for the future construction, of waste management facilities in the Borough, in line with waste growth. To do this the Council will need to identify land within its boundaries suitable for waste management purposes, and or **make land in its ownership** if any, within the Borough available, upon which to construct new facilities. This contract procurement process should not prevent consideration of regional/sub regional facilities, outside of the Borough, particularly where any bidder has facilities and waste management infrastructure nearby.

The contract(s) awarded will be based upon the most economically advantageous bid that best meets criteria set out by the Council jointly with Bradford.

Although the contract(s) will be output based, the analysis of the available technologies (see earlier) suggests that aerobic mechanical and biological treatment or Autoclaving are the likely processes for which bids will be received.

7.3 Justification

Doing nothing is not a realistic option. The waste management methods and treatment required would need both short term solutions and long term contractual arrangements. The long term contract will need significant investment and expertise from the private sector in order to bring about the step changes required to meet targets set for the Council. The short-term solutions will have less risk but may still cause significant changes within the existing waste management system(s).

This Waste Strategy is aligned with the advice given in Calderdale's BPEO study of 2005 carried out by Eunomia Research and Consulting, advisors to the UK Government and DEFRA on waste strategy matters, DEFRA being the principal central government department responsible for waste management in the United Kingdom. It conforms to the Proximity Principal the Waste Hierarchy, and the objective of being sustainable so far as is reasonably practicable.

The shape of the arrangements set out in 7.2 are such as to create enough 'critical mass', to be attractive to private sector contractors, who favour output specifications underpinned by a long term contract of the design build finance and operate type, sometimes funded by the now familiar PFI or PPP arrangements. It is believed that in such arrangements, contractors will take on significant levels of risk. This "critical mass" will be more readily achieved if possible, by Calderdale working jointly with a neighbouring authority.

Clearly it is in the Council's interest to attract as many bidders as possible (given the capacity limitations within the private waste market) in order to provide for the long term the most economically advantageous arrangement, which satisfies the targets and other criteria set for and by the Council.

Part of any procurement under PFI/PPP funding arrangements will require a business case justification for the long-term procurement. This document will make a significant contribution to the business case and other procurement processes, as well as being part of the data provided by the Council to both galvanise and inform the public and other interested groups.

8.0 RISKS

Risk is the uncertainty of outcome, both positive and negative; however it is usually taken to mean a negative outcome. The procurement, development and execution of any long term waste strategy is susceptible to a number of key risks, which could have significant negative impact on the Council both financial, and in terms of service provision.

8.1 Identification of Risk

Though this should not be taken as exhaustive, the main key risks are identified below.

A. Procurement Risk

1. Insufficient interest from the private waste market (approximately 8 contractors), resulting in few or no bidders - the number of contract providers is small and competition from other Council's for similar arrangements high.

2. Insufficient resources and skills in the procurement team - possible delays in achieving timely and qualitative procurement.

3. Changes to key staff - causing delays and a lack of consistency in procurement decisions.

4. Political changes within the Council - could cause its own delays and changes to priorities and objectives.

5. Change in government strategy - new administrations with new waste legislation and targets.

6. Financial - inability to secure the required funding - particularly if PFI credits are being sought.

7. Bids are unaffordable – or bids do not represent value for money.

B. Regulatory Risks

1. Site identification failure - unable to find a suitably designated, sized and located site(s) upon which to build new facilities.

2. Planning constraints - inability to obtain the required planning permission(s) to develop new facilities on identified sites.

3. Planning delays - planning application process delays resulting in significant delays to the project.

4. Waste licence undeliverable - inability to obtain the required waste licence permissions to operate the new facilities.

5. Waste licence delays - waste management licence application process problems resulting in significant delays to the project.

C. Performance Risk

1. Specification incorrect - criteria upon which specification is based proves inaccurate or changes significantly with time, e.g., waste flows and waste growth projections, resulting in the inability of the plant process initially selected to deliver to tonnage targets.

2. Construction delays - unexpected time slippage caused by civil engineering or supply chain delays resulting in the new facilities being delivered beyond target dates.

3. Dovetail issues - handover of the existing operational arrangements to the new contractor causes short term disruption to the service delivery and performance.

D. Technology Failure

1. Whether working singly or jointly with another authority, the technology suggested by the tender may not be acceptable to this authority or both authorities. Or the contractors perception of the Councils policy towards the contractors best assessed/preferred technology option, for example EfW may result in the Council or Councils receiving no viable bids for the contract.

2. Bids combining EfW with other technologies - contractors may decide to submit viable options linked to EfW in the form of mass burn incineration or the burning of solid recovered fuel (SRF). This strategy would carry a varying degree of risk both in terms of planning, policy and public acceptance. These risks may be influenced by the location of the proposed facilities (within or without the Borough).

8.2 Evaluation

It is possible to use established risk assessment methodology in order to evaluate the identified risk in terms of its likelihood of occurring, and its impact if it does occur. In this way it is possible to understand risk management, to know what should be avoided, and what could be acceptable.

Given below in Table V is an example of a risk assessment as applied to those risks identified in 8.1.

Table V Risk Assessment

Risk Identified	Likelihood			Impact			Comments
	H	M	L	H	M	L	
A1		3		3			Significant implications (performance and financial) if fail to deliver new waste management arrangement
A2			3	3			Any significant delays in securing new waste facilities will have major performance and target consequences
A3			3	3			Any significant delays in securing new waste facilities will have major performance and target consequences
A4			3		3		Any realignment of priorities could have negative delaying impact
A5			3			3	Unlikely - certainly without full consideration of consequences to local authorities by Government beforehand
A6			3			3	Issues of funding acceptability should have been fully address in the procurement business case beforehand - less of an issue if not pursuing PFI funding
A7			3	3			Providing procurement is competitive, this should not arise, considering that do nothing will be more expensive in any event
B1		3		3			This is possible for waste facilities - such failure has high impact, can be mitigated by the Council identifying suitable sites up front
B2	3			3			Likely with waste facilities with high impact - whole exercise fails
B3	3			3			Planning permission is achieved only after delays, results in missed targets and financial costs (LATS)
B4			3	3			Although cannot be taken for granted, obtaining waste licence should not be an issue
B5		3		3			That delays in obtaining waste licence are likely if for no other reason of capacity issues within the EA to process them, again delays can result in missed targets and financial costs
C1		3				3	Though waste growth is difficult to predict accurately over such a long term, predictions would need to be significantly wrong to have a medium to high impact
C2			3		3		Not thought to be likely, or cause significant project delays unless technology supplier problems are encountered, in which case delays may affect target hitting
C3			3			3	Provided management of handover is done well, this will not be an issue
D1			3	3			EfW is the tried and tested technology. However discussions with contractors suggest that MBT and Autoclaving are viable options
D2		3			3		Rdf is an output of many MBT plants and could be a product of Autoclaving. Alternative disposal routes for some products may require further market developments.

8.3 Risk Management

Inevitably in a project of this size and complexity, there will be risks in delivering the long-term waste management solutions for the Council. The Council will therefore need to have an understanding of risk analysis , and a view towards risk and decide how much risk it wishes to accept.

Such considerations will cover areas of:

- **Risk Tolerance** - how much risk is the project to take on, how much will be with the contractor, how much retained by the Council?
- **Risk Mitigation** - can the risks be prevented, or their impact reduced, or indeed transferred elsewhere?
- **Acceptance** - the Council will have to accept some risk, therefore it will need to plan for contingencies should they occur.

Risks will be allocated to whichever party is best able to manage them. The nature and complexity of the technological solutions outlined in Section (5.4) Waste Treatment Technologies and Section 7.0 (Options Selection) suggests that the contractor is best placed to carry most of the risk, particularly with regard to risk mitigation and risk tolerance.

For example in the case of risk mitigation this is because the contractor will choose the technology, operate and control the waste management facilities, and in some cases have the advantage of basing their assessments on existing facilities they already run. Thus their risk mitigation assessments should be reasonably robust.

Risk tolerance will be accounted for by the contractor's decision on the contract gate price fees. If the risk for a particular tender is assessed as being higher than the norm, then the gate fee tendered will be increased to reflect the extra risk.

No two parties can enter a contract without accepting risk. In the context of this contract the Councils main risk concern should be risk acceptance in terms of planning for unexpected contingencies. For example major plant breakdowns and the risks of extra costs being incurred because of the requirement to divert waste elsewhere, these are the proper concerns and risks that the Council will need to accept.

For its part however the Council will not wish to lose control of a very public facing service (particularly if the contractors tendering suggests at early scoping meetings that refuse collection should be included in the disposal contract).

As such, during the contract negotiations, it will be important to establish the extent to which the Council is able or willing to balance process demands (from the technology adopted) with customer expectations and needs and the customers present type and level of service.

List Of Appendices

Abbreviations

AD	Anaerobic Digestion
ATT	Advanced Thermal Treatment
BMW	Biodegradable Municipal Waste
BPEO	Best Practicable Environmental Option
BVPI	Best Value Performance Indicators
CAS	Chemical Advisory Service
CMBC	Calderdale Metropolitan Borough Council
CPA	Comprehensive Performance Assessment
Defra	Department of Environment Food and Rural Affairs
DBFO	Design Build Finance Operate
DIY	Do It Yourself
FTE	Full Time Equivalent (staff)
HWRS	Household Waste Recycling Site
H & S	Health & Social
HQ	Head Quarters
LATS	Landfill Allowance Trading Scheme
MDC	Metropolitan District Council
MRF	Materials Recovery Facility
MBT	Mechanical and Biological Treatment
PFI	Private Finance Initiative
PPG	Planning Policy Guidance
PPP	Public Private Partnership
PPS	Policy Planning Statement
RPG	Regional Planning Guide
RSS	Regional Spatial Strategy
RTAB	Regional Technical Advisory Boards
SA	Sustainability Appraisal
SEA	Strategic Environmental Assessments
SRF	Solid Recovered Fuel
TLS	Transfer Loading Sation
TUPE	Transfer of Undertakings, Protection of Employment
UDP	Unitary Development Plan
WS2000	Waste Strategy 2000
MWMS	Municipal Waste Management Strategy
EU	European Union
ELV	End of Life Vehicles
MSW	Municipal Solid Waste
EPA	Environmental Protection Act
RAY	Recycling Action Yorkshire
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment
WCA	Waste Collection Authority
WRG	Waste Recycling Group
WS2000	Waste Strategy 2000
YHRWS	The Yorkshire and Humberside Regional Waste Strategy
WYWMJC	West Yorkshire Waste Management Joint Committee

GLOSSARY OF TERMS

Anaerobic Digestion

A process where biodegradable material is encouraged to break down in the absence of air. Materials are placed into an enclosed vessel and in controlled conditions the waste breaks down into gas and solids.

Best Value

A legal obligation on local authorities to give high quality services and to seek continuous improvement in them. Government vision for ensuring services are efficient and of high quality to be responsive to the needs of citizens, not the convenience of service providers.

Biodegradable Municipal Waste

Waste collected by the Waste Collection Authority, including trade wastes and Civic Amenity wastes. Material that can be broken down usually by micro-organisms into basic elements. The Government has declared that municipal wastes is 68% biodegradable.

Biological Treatment

Any biological process that changes the properties of waste (e.g., anaerobic digestion or composting).

Bring Sites

A network of mini-recycling sites, e.g., bottle banks, textile banks, etc., located in public areas such as supermarket car parks where the public can deposit their recyclable items.

Civic Amenity Waste

In Calderdale, civic amenity sites are referred to as Household Waste Recycling Sites. Civic Amenity Waste is household waste, normally delivered by the public direct to sites provided by the local authority. Consists generally of bulky items such as beds, cookers and garden waste as well as recyclables.

Clinical Waste

Waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practices, which may present risk of infection. Local authorities have a duty to collect clinical wastes arising in the home and may offer trade waste collection contracts to collect clinical wastes from commercial establishments such as those above.

Commercial Waste

Waste arising from premises that are used wholly or mainly for trade, business, sport, recreation or entertainment (excluding industrial waste), for which a Local Authority may have waste collection arrangements in place, in which case it will become municipal waste.

Composting

The biological process in which organic wastes, such as garden and kitchen waste are converted into a stable granular material which can be applied to land to improve soil structure and enrich the nutrient content of the soil.

Controlled Waste

Is used to describe waste that must be managed and disposed in line with waste management and other related regulations. It includes municipal, commercial and industrial waste. It can be from a house, school, hospital, shop, office, factory or any other trade or business. It may be solid or liquid; scrap metal, old newspapers, a used plastic bottle, etc. It does not need to be hazardous or toxic to be a controlled waste.

Dry Recyclable Material

Clean contaminant free materials such as glass, paper, metals which have been segregated from the waste stream.

Energy Recovery from Waste

Includes a number of established and emerging technologies, though most energy recovery is through incineration technologies. Many wastes are combustible, with relatively high calorific values. This energy can be recovered through, for instance, incineration with electricity generation. All modern incinerators, known as energy from waste plants, are highly fuel efficient, providing both electricity and heat and also known as combined heat and power.

Environment Agency

Established in 1996, it combined the functions of former local waste regulation authorities, the National Rivers Authority and Her Majesty's Inspectorate of Pollution. Intended to promote a more integrated approach to waste management and consistency in waste regulation. The agency is responsible for issuing and inspection of licensed waste facilities, including those used to manage municipal wastes.

Gasification

A type of pyrolisis.

Hazardous Waste

Hazardous waste, previously known as Special Waste, is controlled waste which is considered so dangerous or difficult to keep, treat or dispose of that special provision needs to be made by regulations.

Household Waste

Is defined in the Environmental Protection Act 1990, supplemented by the Controlled Waste Regulations 1992. It includes waste from refuse collection rounds, bulky waste collection, hazardous household waste collection (including clinical wastes) and separate garden waste collection, plus waste from services such as street sweeping, litter and household waste recycling centres. The definition also covers waste from schools.

Incineration

This is the controlled burning of waste, either to reduce its volume, or its toxicity. Energy recovery from incineration can be made by utilising the calorific value of paper, plastic etc to produce heat or power. Current flue-gas emission standards are very high. Some ash can be recycled or landfilled, other require specialist treatment.

Industrial Waste

Waste arising from factories and industrial plants.

Inert Waste

Waste which, when deposited into a waste disposal site, does not undergo any significant physical, chemical or biological transformation and that complies with the criteria set out in Annex III of the EC Directive on the Landfill of Waste.

Kerbside Recycling Collection

A system whereby the Council collects recyclable material from separate containers presented by householders to either the boundary of their property or the kerb outside their property.

Landfill

Landfill is the disposal of waste in disused quarries or aggregate workings, where it is buried. These sites are subject to strict controls to prevent the contamination of water supplies with leachate emanating from the landfill, and to control the emission of greenhouse gases, such as methane, coming from the rubbish as it decompose. This has been the main method of disposal for rubbish in the UK. The EU has set strict targets to reduce the amount of biodegradable landfill, which contributes to greenhouse gas emissions.

Landfill Aftercare

The monitoring of the physical and chemical condition of closed landfill sites to ensure that these sites do not pollute or damage the environment.

Landfill Tax

A tax levied by Central Government on every tonne of waste disposed of at landfill.

Materials Recycling Facility

A system whereby waste collected by the Council is sorted for recycling, re-use and composting prior to ultimate disposal, or further treatment.

Municipal Waste

Includes all waste under the control of local authorities. It includes all household waste, street litter, waste delivered to Council recycling points, Council office waste, HWRS site waste, and some commercial waste from shops and smaller trading estates where local authority waste collection agreements are in place.

Prevention

Combined efforts to reduce and re-use waste to prevent it entering the waste stream and having to be recycled, treated or disposed of.

Producer Responsibility

Producers and others involved in the distribution and sale of goods taking greater responsibility for those goods at the end of the product's life.

Proximity Principle

Suggest that waste should generally be disposed of as near to its place of production as possible.

Pyrolysis

A process that involves heating the collected waste in a closed vessel, in the absence of air, to break down the waste down into three separate fractions. That is gas, solid and liquid. The gas can be used for energy recovery from tyres and waste plastics.

Recycling

Involves the reprocessing of wastes, either into the same product or a different one. Many non-hazardous industrial wastes such paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies or by in-house equipment.

Reduction

Achieving as much waste reduction as possible is a priority. Reduction can be accomplished within a manufacturing process involving the review of production processes to optimise the utilisation or raw (and secondary) materials and recirculation processes. It can be cost effective in terms of lower disposal costs, reduced demand for raw materials and energy costs. It can be carried out by householders through actions such as home composting, re-using products and buying goods with less packaging.

Regional Self-Sufficiency

Dealing with wastes within the region or country where they arise.

Re-use

Can be practised by the commercial sector with the use of products designed to be used a number of times, such as reusable packaging. Householders can purchase products that use refillable containers, or re-use plastic bags. The processes contribute to sustainable development and can save raw materials, energy and transport costs.

Sustainable Waste Management

Means using material resources efficiently, to cut down on the amount of waste we produce. Where waste is generated, dealing with it in a way that actively contributes to the economic, social and environmental goals of sustainable development.

Trade Waste

Waste collected by the Council from businesses in the district, some of which is part of Municipal Waste.

Transfer Station

A site, which receives, delivered waste, for sorting prior to transfer to another place for recycling, treatment or disposal.

Treatment

Involves the chemical or biological processing of certain types of waste for the purposes of rendering them harmless, reducing volumes before landfilling, or recycling certain wastes.

Unitary Authority

A local authority that provides the full range of local government services. Calderdale is a unitary authority.

Waste

This is the wide ranging term encompassing most unwanted materials and is defined by the Environmental Protection Act 1990. Waste includes any scrap material, effluent or unwanted surplus substance or article that requires to be disposed of because it is broken, worn out, contaminated or otherwise spoiled. Explosives and radioactive wastes are excluded.

Waste Arisings

The amount of waste generated in a given locality over a given period of time.

Waste Collection Authority

A local authority charged with the collection of waste from each household in its area on a regular basis. Can also collect, if requested, commercial wastes from businesses.

Waste Disposal Authority

A local authority charged with providing disposal sites to which it directs waste collection authorities for the disposal of their controlled waste, and with providing civic amenity facilities. Calderdale MBC is both a Waste Collection Authority and a Waste Disposal Authority.

Waste Hierarchy

This is a framework which suggest that the most effective environmental solution may be to reduce the amount of waste generated; where that is not practicable, to re-use products, either for the same or different purpose; failing that, value should be recovered from waste through recycling, composting or energy recovery from waste; only if none of these offer an appropriate solution should waste be disposed of.

Waste Management Licensing

Licences are required by anyone who proposes to deposit, recover or dispose of waste. The licensing system is separate from, but complementary to, the land use planning system. The purpose of a licence and the conditions attached to it is to ensure that the waste operation that it authorises is carried out in a way that protects the environment and human health.

Appendix 1

Recycling Companies used by FOCSA

Item	Recyclate Type	Company
1	Car Batteries	Morley Trade Waste Ltd.
2	Oil	Goodwin Oils
3	Timber	Envirowaste Ltd.
4	Newspaper & Magazines	Blackburn Waste Disposal
5	Shoes	European Recycling Company Ltd.
6	Cardboard	Sonoco Ltd.
7	Fridges	Shaw Recycling Ltd.
	Fridges	T. M. Recycling
8	Metal	Morley Waste Traders
9	Glass	Berrymans Ltd.
	Glass	Glass Recycling UK Ltd.
10	Electrical Waste (WEEE)	T & M Recycling
11	Textiles	Tradehouse Elland Ltd.
	Textiles	British Heart Foundation
	Textiles	Oxfam
12	Green waste	Stephen Butterfield
	Green Waste	Holroyd Farm
13	Plastics	Bradford Metropolitan Borough Council
14	Bicycles	The Inside Out Trust

Appendix 2

Bring Recycling Sites in Calderdale 2005/06

	AREA	STREET	GLASS	PAPER	CANS	TEXTILE	BOOKS & MUSIC	SHOE	CARRIER BAGS	MOBILE PHONES
1	Barkisland	Junior School		✓	✓					
2	Brighouse	Sainsbury's, Mill Lane	✓			✓	✓	✓		
3	Brighouse	Tesco's, Huddersfield Road	✓	✓	✓	✓	✓	✓	✓	✓
4	Boothtown	McBurney Close	✓	✓						
5	Cornholme	Vale Centre	✓	✓	✓	✓		✓		
6	Greetland	Community Centre CP	✓	✓	✓	✓		✓		
7	Halifax	Tesco's, Westgate								✓
8	Halifax	Asda, Thrum Hall Lane, Pellon	✓					✓		
9	Halifax	Morrisons, Keighly Road	✓			✓				
10	Halifax	Sainsbury's, Wade Street	✓	✓		✓		**Included in Textiles**		
11	Halifax	Square Chapel	✓	✓						
12	Halifax	Tesco, King Cross	✓	✓	✓	✓		✓	✓	✓
13	Heptonstall	Bowling Club	✓	✓	✓					
14	Mixenden	Cragg Court	✓	✓	✓					
15	Mytholmroyd	WMC, Stocks Drive	✓							
16	Northowram	Wye Vale Garden Centre		✓	✓					
17	Todmorden	Hallroyd Place		✓	✓					
18	Todmorden	Safeway's	✓	✓	✓	✓	✓	✓		
19	Walsden	Gordon Riggs Garden Centre	✓	✓	✓	✓		✓		

Appendix 3

Household Waste Recycling Sites in Calderdale 2005/06

	AREA	STREET	GLASS	PAPER	CANS	TEXTILE	SHOE	CARD BOARD	METAL	FRIDGES	OIL	GREEN WASTE	BATTERIES	BRICKS & RUBBLE	TIMBER	PLASTIC BOTTLES
1	Brighouse	Atlas Mill Road	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Elland	Ainley's, Huddersfield Road	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
3	Halifax	Lee Bank (Dean Clough)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	Sowerby Bridge	Mearclough (Milner Royd)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Todmorden	Eastwood	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Appendix 4 Gate Fees Per Tonne – Total Gate Fee Per Tonne – Total Gate Fee Per Tonne Plus Lats – Cost Per Tonne All Tonnage – Cost Per Tonne Landfill only Tonnage.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Year	MSW	Household Recycling Tonnage	Balance to Landfill	LAT's Allowances	Net Weight over Allowances	Gate Fee per tonne	Landfill Tax per tonne	Total Gate Fee	Gross Landfill Disposal Cost	Impact of LAT's Fines	Gross Fines & Costs	Cost Per Tonne	Cost Per Tonne
	Based on 3% growth	See note 1	Col 2-3	Stautory Targets	Col 4-5	Based on 3% Inflation	Stautory Targets	Col 7+8	Col 9x4	Based on £150 per tonne	Col 10+11	Col12/2	Col12/4
2004/05	93,797												
2005/06	85,913	17,183	68,730	92,212	-23,481	£11.28	£18.00	£29.28	£2,012,426	£0	£2,012,426	£23.42	£29.28
2006/07	88,490	17,698	70,792	86,856	-16,064	£11.62	£21.00	£32.62	£2,309,132	£0	£2,309,132	£26.09	£32.62
2007/08	91,145	22,786	68,359	79,713	-11,354	£11.97	£24.00	£35.97	£2,458,659	£0	£2,458,659	£26.98	£35.97
2008/09	93,879	23,470	70,410	70,787	-377	£12.33	£27.00	£39.33	£2,768,925	£0	£2,768,925	£29.49	£39.33
2009/10	96,696	29,009	67,687	60,074	7,614	£12.70	£30.00	£42.70	£2,889,950	£1,142,034	£4,031,984	£41.70	£59.57
2010/11	99,597	29,879	69,718	53,387	16,331	£13.08	£35.00	£48.08	£3,351,791	£2,449,640	£5,801,431	£58.25	£83.21
2011/12	102,585	30,775	71,809	46,700	25,109	£13.47	£35.00	£48.47	£3,480,515	£3,766,385	£7,246,900	£70.64	£100.92
2012/13	105,662	31,699	73,964	40,013	33,950	£13.87	£35.00	£48.87	£3,614,817	£5,092,541	£8,707,358	£82.41	£117.73
2013/14	108,832	32,650	76,182	38,297	37,885	£14.29	£35.00	£49.29	£3,754,968	£5,682,803	£9,437,771	£86.72	£123.88
2014/15	112,097	33,629	78,468	36,581	41,887	£14.72	£35.00	£49.72	£3,901,254	£6,283,050	£10,184,304	£90.85	£129.79
2015/16	115,460	34,638	80,822	34,865	45,957	£15.16	£35.00	£50.16	£4,053,977	£6,893,582	£10,947,560	£94.82	£135.45
2016/17	118,924	35,677	83,247	33,147	50,100	£15.61	£35.00	£50.61	£4,213,456	£7,514,928	£11,728,384	£98.62	£140.89
2017/18	122,491	36,747	85,744	31,431	54,313	£16.08	£35.00	£51.08	£4,380,024	£8,146,964	£12,526,988	£102.27	£146.10
2018/19	126,166	37,850	88,316	29,715	58,602	£16.57	£35.00	£51.57	£4,554,035	£8,790,238	£13,344,274	£105.77	£151.10
2019/20	129,951	38,985	90,966	27,999	62,967	£17.06	£35.00	£52.06	£4,735,862	£9,445,088	£14,180,950	£109.13	£155.89

Note 1: 20% 2005/07, 25% recycling 2007/8 and 2008/9, 30% thereafter.
3% growth in municipal waste

Start Year	Target Year	Total Costs	**Total Landfilled**	Cost Per Tonne
2005/6	2009/10	£13,581,125	345,978	£39.25
2005/6	2012/13	£35,336,814	561,469	£62.94
2005/6	2019/20	£117,687,043	1,145,214	£102.76

Start Year	Target Year	Total Costs	**Total MSW**	Cost Per Tonne
2005/6	2009/10	£13,581,125	456,124	£29.78
2005/6	2012/13	£35,336,814	763,967	£46.25
2005/6	2019/20	£117,687,043	1,597,888	£73.65

Appendix 5

TREATMENT TECHNOLOGIES - OPTIONS APPRAISAL (APPROXIMATE/INDICATIVE VALUES)

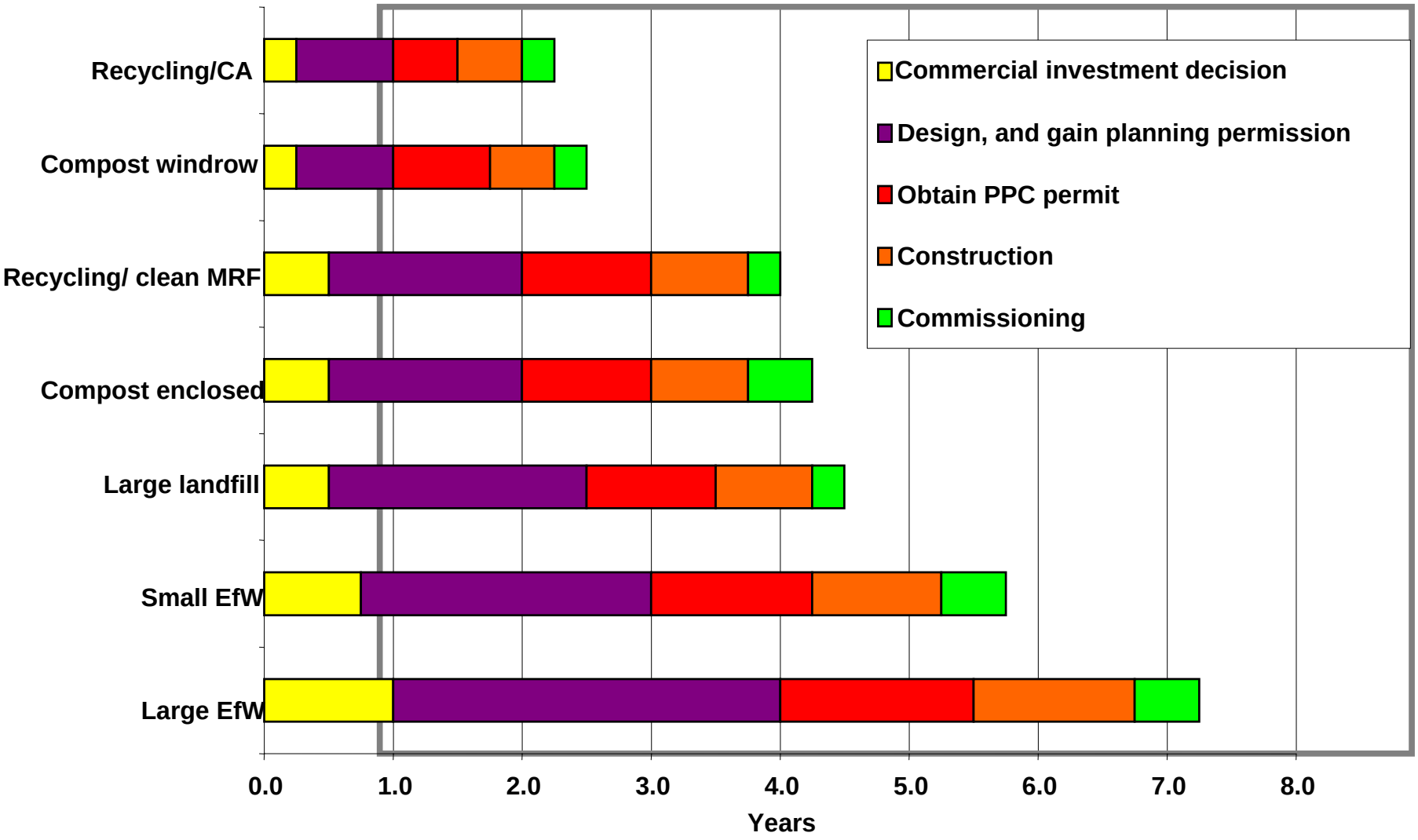
Technology	Annual Tonnage Throughput	Capital Expenditure	Operating Costs/Tonne	Staff Numbers	Advantages	Disadvantages
Autoclave	200,000	£12m	£45	25	Sterilises waste - can be regarded as clean process, recovers dry recyclables that are clean. Produces a floc which can be used as compost and/or RDF, though other uses may develop. Flexible to waste growth changes as modular in construction. RDF capable of being burnt or gasified to extract energy. No known specific public concern/perception issues. Claims are that the process will meet recycling/composting recovery and landfill diversion targets.	Unproven technology on MSW in UK. Uncertainty of end markets for floc and therefore costs. Will not achieve landfill diversion without end market for floc, and therefore cannot be regarded as a total solution on its own.
Pyrolisis and gasification	100,000	£20m	£60	35	Public perceptions unknown, though believed to be more acceptable means of thermal treatment than incineration.	Unproven technology on MSW in UK, though some demonstrator plants planned. Not regarded as total solutions of themselves, but rather a possible sub component of MBT or autoclaving, to recover value from residuals i.e., RDF or floc.
Anaerobics Digestion	100,000	£15m	£60	20	No known adverse public perceptions	Rather like ATT, not regarded as a total solution, but a sub component of MBT and possibly autoclaving, to recover value from residuals. Unproven technology on MSW, though likely to work much better on already segregated rather than crude MSW.

Appendix 5 (continued)

TREATMENT TECHNOLOGIES - OPTIONS APPRAISAL (APPROXIMATE/INDICATIVE VALUES)

Technology	Annual Tonnage Throughput	Capital Expenditure	Operating Costs/Tonne	Staff Numbers	Advantages	Disadvantages
Materials Reclamation Facility (MRF) (clean)	30,000	£3m	£60	30	No known adverse public perceptions, will assist in meeting recycling targets and can compliment other kerbside and bring site schemes	Not a total solution on its own and will not meet landfill diversion targets
Mechanical & Biological Treatment (MBT)	200,000	£20m	£50	30	Technology now being "proved" in UK on MSW. Flexible to waste growth changes as modular in construction. Recovers dry recyclables and produces a biological residue for composting and on RDF fraction. No known specific public concerns/perceptions. Will meet recycling/composting, recovery and landfill diversion targets provided residuals are composted/RDF and not landfilled.	Uncertainty of end markets for residual products of compost/RDF, and therefore costs. Will not achieve landfill diversion targets if residual products are landfilled, therefore cannot be regarded on its own as a total solution.
Incineration	200,000	£40m	£45	40	Proven technology including heat and power recovery. Replaces consumption of other fossil fuels when heat and power recovery is used. Meet all recovery and landfill diversion targets. However may require some front end recovery technology in order to enable Council's to meet recycling/ composting targets. Can be regarded as a near total solution.	Public perception very poor, if not hostile and achieving planning likely to be difficult and lengthy. Requires longer term 25 contracts and expensive upfront capital costs over contract period. Inflexible to changes in waste quantities.

Appendix 6



Source: DEFRA Waste Implementation Programme New Technologies

SECTION 3: IMPLICATIONS FOR CALDERDALE, CONCLUSIONS AND RECOMMENDATIONS

This Section offers our principle recommendations and conclusions. The conclusions are somewhat open-ended as regards the actual choice of treatment system. This, as will become clear, is due to the fact that there are decisions yet to be made which need to be finalised before one can recommend any specific approach. Furthermore, consultation with local residents is necessary for a decision to be made concerning a local facility.

CONCLUSIONS: APPROPRIATENESS FOR CALDERDALE

In this Chapter, we bring together some of the key issues which will affect a decision in Calderdale as to which technologies might be best suited to the authority. The following issues are discussed:

- Which Technology Performs the Best?
- Scale
- Planning Issues
- Procurement Lead Times
- Costs
- Key Operational Risks
- Reliability

We conclude with some recommendations for Calderdale.

5 Which Technology is 'The Best' on Technical Grounds?

On technical grounds, it is very difficult to say which technology might perform 'the best'. A review of literature makes it possible to argue the point in favour of any one of them.

Most technologies perform well in one or more categories, but less well in others. Making a decision as to which technology 'is best' necessarily implies making trade-offs across issues which might be deemed to be more or less important to different individuals. In addition, our knowledge of how emissions from different facilities might translate into impacts is constrained by the extent of our knowledge, and may anyway vary from place to place.

Another important point to make is that as far as several of the technologies identified above are concerned, the performance varies importantly from one process design to another. For this reason, it is becoming increasingly difficult to speak in general terms about the performance of a 'type of technology' since performance variation within any group may be significant. This is likely to be less true of more mature technologies, such as incineration and landfill, than it is for the newer processes, notably the ATT systems and the AD-based MBT systems, where relatively few suppliers can claim to have established their processes as fully reliable. However, even at landfills, leachate treatment systems vary in their ability to reduce the loading of effluent discharged into surface waters.

6 The Issue of Scale

Generally, the issue of scale appears to rule out typical grate incinerators if Calderdale intends to procure its own facility. Of the more conventional combustion technologies,

the Cyclerval process stands out as being potentially more appropriate to Calderdale. A fluidised bed incinerator (FBI) could also be considered, though since this would require some pre-treatment of waste, it may be more sensible to combine the use of a basic MBT system with the FBI. In this case, it would seem an interesting option to explore the potential for construction of an FBI in the region to serve more than just Calderdale. The potential to partner with Bradford would be interesting from this perspective. However, the partnering process is likely to involve considerable time.

Some ATT systems are also marketed at relatively large scale, though others are made to be economically applicable at smaller scales. The Energos system would appear to be especially interesting from this point of view. Others which are targeting smaller scale applications include Compact Power and IET-Entech. The former is still relatively unproven on MSW whilst the latter has not performed for long on MSW in a European setting, and we suspect its emissions will be rather higher (i.e. there will be greater environmental impacts) than from either the Energos or the Compact Power systems.

For most MBT systems based around aerobic treatments, the sort of scale being sought by Calderdale is around the optimal size. Table 2 shows that this type of capacity is far from unusual for MBT plants. Indeed, the average size for the German facilities listed is around 70,000 tonnes.

Table 2: German MBT Facilities, Location, Startup Date and Capacity (tonnes)

Location	Startup	Capacity
(BB) Niederlausitz	1999	37,000
(BB) Schwanebeck/ Nauen	Apr-98	30,000
(BB) Wittstock	Jun-93	1,200
(BW) Buchen	Aug-00	30,000
(BW) Calw	Nov-94	30,000
(BW) Kahlenberg	Dec-00	20,000
(BW) Reinstetten, Biberach	Jan-98	40,000
(BW) Schäbisch Hall/ Hasenbühl	Dec-76	85,000
(BY) Quarzbichel	Jan-96	30,000
(BY)Erbenschwang	1998	22,000
(HE) Aßlar	Planned 1997	40,000
(HE) Wetteraukreis	1997	40,000
(MV) Bad Doberan	Nov-97	2,000
(MV) Ihlenberg	Planned 2005	120,000
(MV) Rügen	Oct-99	12,000
(NI) Bassum	Sep-97	65,000
(NI) Göttingen Deiderode	Planned 2004	130,000
(NI) Großefehn	1999	43,000
(NI) Hannover	Planned 2003	100,000
(NI) Lüneburg	Jan-96	37,500
(NI) Mansie II	Aug-98	30,000
(NI) Nienburg / Krähe	Oct-94	65,000
(NI) Oldenburg	Aug-98	88,000

Location	Startup	Capacity
(NI) Osnabrück/ Piesberg	1996	130,000
(NI) Osterholz-Scharmbeck	Jan-97	2,000
(NI) Schaumburg (AWS)	1993	67,500
(NI) Sedelsberg	Aug-95	65,000
(NI) Wiefels	Jun-97	56,000
(NI) Wilhelmshaven	1993	72,000
(NI) Wilsum auch Bentheim-Wilsum	Jul-00	35,000
(NW) Bochum	Planned 2004	100,000
(NW) Borken auch Gescher (Borken)	Dec-00	85,000
(NW) Horm	Apr-95	180,000
(NW) Leppe	Planned 2004	75,000
(NW) Münster	Pilot plant 04/1996 Scaled up 2002	100,000
(NW) Neumünster	Planned 2005	140,000
(NW) Neuss	Feb-01	161,500
(NW) Pohlsche Heide auch Hille	2003	100,000
(NW) Warendorf	2001	circa. 80000 (1 line.)
(RP) Kapiteltal / Kaiserslautern	Jan-99	20,000
(RP) Kirchberg auch Kirchberg - Simmern	Oct-95	35,000
(RP) Linkenbach	Sep-98	61,000
(RP) Meisenheim	Jul-94	53,000
(RP) Mertesdorf/ Trier	2001	220,000
(RP) Rennerod	Apr-00	120,000
(RP) Singhofen	May-00	80,000
(SH) Flensburg	May-72	100,000
(SH) Lübeck	2001	120,000
(SN) Dresden	2001	85,000
(ST) Stendal	May-00	80,000
(TH) Wiewärthe	1999	85,000
Lichterfeld	1999	40,000

MBT systems including anaerobic digestion have, on average, been larger than systems where the biological treatment has been aerobic. Recent investments in AD systems for residual waste treatment in Spain have tended to be of the order 100,000 tonnes in capacity. Other facilities in excess of 100,000 tonnes have already been constructed in Austria, Belgium, Canada, Germany and France.

It seems likely, therefore, that scale favours:

1. Oscillating kiln;
2. ATT;
3. Aerobic MBT (for RDF coupled to ATT/ FBI)
4. Simple AD-based MBT; and

5. Aerobic MBT (for stabilisation only)
6. Autoclave, but coupled to other treatments.

For 1-5 above, we would expect the land requirement to be between 1ha and 2ha for a 50,000 tonne – 60,000 tonne facilities, the figures being at the lower end of the range for 1, 2 and 3, slightly higher for 4, and higher still for 5.

7 Planning Issues

There are a number of planning issues of relevance here. The first concerns the likelihood of different types of facility passing through the planning process without significant problems. Essentially, the more facilities look as though they are incinerators, and the larger the proposal, the more likely there are to be major problems, though no waste facility will have an easy ride through the planning system. In approximate order of ease, we would suggest that the non-landfill treatments might be ranked as follows:

1. Aerobic pre-treatment prior to landfilling

2. Aerobic treatment to produce RDF (bio-drying), RDF treatment off-site

3. Aerobic treatment to produce RDF (splitting), RDF treatment off-site

4. MBT using Anaerobic treatment seeking to maximise materials recovery

5. MBT using Anaerobic treatment and limited materials recovery

6. ATT

7. Aerobic treatment to produce RDF (bio-drying), RDF treatment on-site

8. Aerobic treatment to produce RDF (splitting), RDF treatment on-site

9. Incinerator.

In all cases, there would need to be a site in order for the facility to be developed. Currently, there is no site designated for such a purpose in the UDP. The potential for facilities to be acceptable for development on industrial land might follow the order as below:

- High Prospect
    - Aerobic pre-treatment prior to landfilling
    - Aerobic treatment to produce RDF (bio-drying)
    - Aerobic treatment to produce RDF (splitting)

- Medium Prospect
    - MBT using Anaerobic treatment seeking to maximise materials recovery
    - MBT using Anaerobic treatment and limited materials recovery
- Low Prospect
    - ATT
    - Incinerator.

The planning issue is clearly significant in the context of the time available. As was shown in Chapter 5, the longer the time taken to commission any facility, the greater the risk for the Council's that its LATS balance falls into the red, and the greater the deficit of allowances will be. This will have cost implications for the Council (potentially quite serious ones).

Evidently, a strategy base upon continued landfilling essentially exports the planning issues elsewhere whilst relying upon continued availability of landfill void, and the costs of and allowances it is necessary to purchase being affordable.

8 Lead Times

Procurement lead times are important for Calderdale because of the potential risk of exposure to the LATS market, and the associated costs of allowances, or fines. The time from commencement of the procurement process to the first day of operation of a facility is likely to be longer for larger, more complex and more contentious facilities. There are also ways of speeding up processes for procurement, but Calderdale has little time to lose if it is to have a facility in place by the end of the decade or early in the next. The actions required before commissioning include the following (and some processes may be run, to some degree, concurrently):

- *Consultation*;
  There is a need for some discussion to occur within Calderdale concenring why facilities are needed, what the options are, and what preferences might be for residual waste treatment;
- *Planning*;
  On the planning side, if Calderdale is not partnering with others, there is a need to designate a site and probably, for a successful procurement, to secure the site and seek planning permission for a facility of the preferred nature;
- *Procurement;*
  On the procurement side, the rules which have to be followed in such processes are likely to mean that the process takes at least a year and probably rather longer. If Calderdale was to procure a facility jointly with another authority, the financial arrangements between the authorities would have to be agreed. This itself is likely to take up valuable time;

- *Permitting;*
  Any successful tenderer will need to have a permit to enable to facility to operate. The application process can take some months, though this should not be unduly onerous;
- *Construction*
  The facility's construction will take time, the more so the greater is the size of the facility and its complexity.
- *Testing*
  Facilities need to undergo testing before they become fully operational.

From where Calderdale is today, our view is that a time period of at least 4 years is likely to be required, and probably longer, even for relatively simple facilities. For more complex ones, the period would most likely increase to around 6 years on an optimistic timescale.

This implies that Calderdale is unlikely to have a facility in operation prior to 2010/11. By this time, unless Calderdale has implemented quality collection systems for dry recyclables and biowaste, and has reconfigured its HWRCs (and possibly put more of them in place), Calderdale will be fairly deeply in the red in respect of its LATS balance.

Simpler facilities are therefore likely to have more to recommend them than more complex ones. Subject to Environment Agency consultations agreeing that the outputs might be considered to have lost most of their biodegradability, basic stabilisation processes may have much to recommend them.

Equally, those facilities likely to be most problematic in the planning process, especially incinerators and ATT facilities, are likely to be least attractive.

9 Costs

As regards costs, one must be careful to distinguish between raw economic costs and contract costs. The costs to the Council of a given contract will in part reflect the risk perceived by bidders of entering into the contract. Furthermore, the more attractive the Council makes itself to bidders, the more competitive the process will be and, other things being equal, the lower the price paid. The Council could, for example, work locally to gain acceptance for a specific type of facility at a given site, and seek planning permission for that type of facility on the proposed site. If the Council has such a site in its possession, this would eliminate much of the perceived problem associated with bidding for what is inevitably going to be a small contract compared with many others being let at the same time.

From our review, it seems that no option – not even landfill – will cost the authority much (if at all) less than £60 per tonne. If Calderdale wishes to constrain contract prices, it should do what it can to secure planning consents on a preferred site. This implies making a decision regarding the type of process to be procured, a decision we feel should be informed by public consultation.

10 Key Risks

Each of the front-running technologies has some risk associated with it. The key ones are as follows:

- **Untreated landfill**
  Exposure to LATS and associated uncertainties re cost; and
  Exposure to future landfill tax increases

- **Incineration**
  Potential exposure to possible future incineration tax;
  Costs of dealing with ash residues;
  Planning delays; and
  Re-definition of recovery;

- **Advanced thermal treatment**
  For some systems, potential issues associated with reliability (bankability of technology);
  Potential exposure to possible future incineration tax;
  Costs of dealing with ash residues;
  Planning delays; and
  Re-definition of recovery

- **Pre-treatment prior to landfilling**
  Uncertainty (to be cleared up in the near future) regarding contribution to LATS targets of stabilized biowaste;
  Where it is claimed that materials can be spread on land, vulnerability to existing, and future, legislation; and
  Exposure to future landfill tax increases;

- **Bio-drying, aerobic treatment**
  Uncertainty in level / stability of demand for / acceptance price for RDF; and
  Uncertainty in legislative framework (standards for RDF etc.)

- **Use of splitting technology for RDF production**
  Uncertainty in level / stability of demand for RDF;
  Uncertainty in legislative framework (standards for RDF etc.);
  Uncertainty (to be cleared up in the near future) regarding contribution to LATS targets of stabilized biowaste;
  Exposure to future landfill tax increases; and
  Where it is claimed that materials can be spread on land, vulnerability to existing, and future, legislation

- **AD-based MBT systems**
  Uncertainty in level / stability of demand for RDF where this is an output;
  Uncertainty in legislative framework (standards for RDF etc.);
  Uncertainty (to be cleared up in the near future) regarding contribution to LATS targets of stabilized biowaste;

Where it is claimed that materials can be spread on land, vulnerability to existing, and future, legislation;

Exposure to future landfill tax increases; and
For some systems, potential issues associated with reliability (bankability of technology)

- **Autoclaving / Other Heat Treatment Technologies**

Uncertainty in level / stability of demand for RDF where this is an output;
Uncertainty in legislative framework (standards for RDF etc.);
Uncertainty (to be cleared up in the near future) regarding contribution to LATS targets of stabilized biowaste;

Where it is claimed that materials can be spread on land, vulnerability to existing, and future, legislation;

Uncertainty concerning legislation regarding what may be spread on land; and
Uncertainty concerning reliability (bankability of technology).

It is notable how many of these risks reflect the fluidity of the policy / legislative environment. No technology will be without its risks in this regard. Those non-landfill treatments for which the framework seems most stable – such as incineration – are likely to be those which are least popular and give rise to planning delays. Those likely to be more acceptable still have questions surrounding how they will be treated under the LATS, but this is unlikely to remain the case for too long.

11 Contribution to Recycling Rates

Because of the likely changes in definition regarding the distinction between recovery and disposal, it seems likely that none of the above approaches will be classified as contributing to ‘recovery’ other than to the extent that:

- They result in the use of RDF in facilities not dedicated to the treatment of waste; and

- They lead to increases in the quantity of material separated out for recycling.

With regard to the latter, the possibilities are likely to be ranked in the following order:

- AD-based MBT systems and Autoclaving / Other Heat Treatment Technologies

- Bio-drying, aerobic treatment and use of splitting technology for RDF production

- Pre-treatment prior to landfilling, ATT and Incineration

- Untreated landfill.

The less familiar treatments are more likely to end themselves to contributing to recycling rates.

In the above we have assumed that no facility produces a residue that qualifies as ‘compost’ over the longer-term.

12 Reliability

In an environment where many technology suppliers are marketing their technologies especially forcefully, the term *caveat emptor* applies with particular force. Potential buyers of equipment must be careful to ensure that what they are getting delivers what the supplier claims, and that fundamentally, the technology is sufficiently reliable to operate continuously without interruptions other than those for planned-in routine maintenance. In this context, the somewhat awkward term ‘proven technology’ has acquired great significance, not just because local authorities need to be assured that the equipment they procure will work, but because financial backers, to the extent that they are at all risk averse, will simply not support projects which carry significant technology risk.

Partly for this reason, one senses, in the waste management community, the tide turning once again towards technologies which are tried and tested. As far as the United Kingdom goes, the key alternative to landfill residual waste treatment has been incineration. New contracts involving mechanical biological treatment, as well as the fact that well over 70 plants already operate in mainland Europe, would suggest that this technology is now also here to stay. Variants using both aerobic and anaerobic technology are already being developed.

As far as gasification and pyrolysis are concerned, there appear to have been greater problems in giving sufficient confidence to both local authorities and would-be financiers. Evidently, some suppliers who already have commercial scale facilities up and running in other countries may perceive this, and not without good reason, as unfair.

Autoclaves are beginning to attract the attention of local authorities, but autoclaves in themselves will need to be coupled to other technologies in order to offer a complete treatment. Merely heating biodegradable wastes will not render those wastes ‘no longer biodegradable’. For that reason, some form of additional treatment for what will be the majority of the input feedstock will be required in order to give confidence to local authorities that they will not remain exposed to the landfill permit market. There remains some uncertainty as to whether or not the materials produced by the process will have the requisite qualities which make them suitable for one or other treatment, and at what cost.

In the midst of this ongoing development in what is an increasingly colourful scene, Defra has instigated the new technologies programme as part of the waste implementation programme. Part of the new technologies programme involves the instigation of demonstrator projects. These projects will focus on technologies not currently in use in the UK. As such, there is significant potential for some of those technologies described above to be scrutinized more closely, possibly giving greater confidence to local authorities and financiers where the projects demonstrate the technologies to be reliable.

13 Summary

In short, there is not enough information yet available for a final decision to be made regarding the best treatment for residual waste in Calderdale. The matters which urgently need to be considered are:

5. **Will Calderdale partner with any other local authority?**
   It is critical to have an early answer to this question since without a clear decision, the procurement process cannot get underway in a meaningful manner since no one knows who is going to procure the facility. The procurement process could have started – at least in outline form – some months ago had the decision been made to partner, or not, with other authorities;

6. **What will Calderdale's waste strategy be?**
   Unless there is a clear idea of how to approach the issue of waste management in a strategic manner, no one can confidently say what size of facility, and of what type, is appropriate for Calderdale. It could be, at one extreme, that Calderdale opts for continued landfilling and paying the market price for permits. We would not advise this, but it remains a possibility. It could be that Calderdale plans for no improvement in source segregation in the future. We would not advice this, but it remains a possibility. The lack of decisions of this nature means that the number of sites, and their size, is only dimly known at present. Calderdale needs a waste strategy. This needs to be developed in consultation with citizens in the spirit of outreach. Once again, this process could have been started some months ago;

7. **Will the Waste Development Framework designate new sites?**
   At present, the approach appears to be to wait for the RSS to come forward with improved data on wastes needing to be managed. However, there is no point in prevaricating where the identification of potential sites is concerned if, for example, it becomes clear that Calderdale is not going to simply 'continue landfilling' and seeks an alternative management route for residual waste;

8. **What approach will Calderdale take to procurement should it choose to procure its own facility, and what will be the implications for financing?**
   This question needs to be considered in the context of the previous questions. The answer has implications both for scale and financing (and potentially, technology choice).

The majority of these questions have received, as yet, no clear answer. It is worrying that decisions which need to be made are not being addressed with the degree of urgency they warrant. This means that the most valuable resource available to Calderdale at present – time – is fast disappearing. The implications will be that other resources – finance – may need to be drawn down to a greater extent than was necessary. We believe these questions need to be addressed urgently.

In the absence of answers to these questions, we have drawn up a basic summary table (**Table 1**) which, in truth, does not do justice to the range of technologies available, or the complexity of the issues which it seeks to summarize.

The Table suggests that:

- In the round, a treatment such as **aerobic stabilisation as a pre-treatment to landfilling** may have much to recommend it. It is technologically simple, it has low capital costs, and it should be capable of fairly swift construction. The key risk at the time of writing relates to the Agency's assessment of the process outputs in terms of their biodegradability. A final decision on this matter is expected shortly. Another issue of relevance to Calderdale may be land-take requirements;

- Less land is likely to be required by **AD-based MBT facilities generating a stabilised biowaste**. Furthermore, more material is extracted for recycling and the environmental performance of the system is thereby improved considerably. However, the cost of such systems, especially at the scale under consideration, may be relatively high, especially if a high contribution to recycling is sought. The other issue is (as for aerobic stabilisation) the treatment of the residues under LATS;

- A treatment such as **autoclaving** may fare well. However, autoclaving is not 'a process' in and of itself. It needs to be coupled to other technologies, and there is still some uncertainty about how well the process will work at higher throughput of mixed residual wastes. Questions therefore remain about where the biomass output would be sent, and for what purpose;

- If time is of the essence, probably, **ATT and incineration** are not the best to consider since they are likely to take longer to construct and are more likely to lead to planning delays. The wisdom of considering either ATT or oscillating kiln technologies looks more questionable as time passes;

- **Facilities generating RDF** are, in the short- to medium-term, almost certainly dependent upon the existence of dedicated facilities to accept the output (because of the existing legislation covering co-incineration). As a result, these processes suffer the same problems in respect of time as do ATT and incineration unless a suitable facility can be found elsewhere;

- Obviously, **untreated landfill** has certain attractions. It is not about to 'go away'. It is, however, no longer a cheap strategy. Indeed, if Calderdale does not act, then it is likely to become a most expensive strategy.

Table 3: Summary Assessment of Performance

	Cost / Scale	Planning	Lead Times	Costs	Key Risks	Recycling Rates	Reliability
Untreated Landfill	✓✓✓	n/a	n/a	✓✓	✓✓✓	n/a	✓✓✓
Incineration	✓	✓	✓	✓	✓✓✓	✓	✓✓✓
ATT	✓✓	✓	✓✓	✓✓	✓✓✓	✓	✓✓
Landfill after pre-treatment	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓	✓✓✓
RDF Biodrying	✓✓	✓✓✓	✓✓✓	✓✓	✓	✓✓	✓✓
RDF Through splitting	✓✓	✓✓	✓✓✓	✓✓	✓	✓✓	✓✓
AD based MBT	✓✓	✓✓	✓✓	✓	✓✓	✓✓✓	✓✓
Autoclaving	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓

Our view is that decisions would ideally be finalised through consultation with citizens in the context of the development of a wider strategy.

RECOMMENDATIONS

On the basis of the work undertaken, the following recommendations are made:

- **Calderdale Urgently Needs to Develop a Waste Strategy to Guide its Progress in the Coming Years**
  The existing configuration of services in Calderdale reveals a (historic) lack of emphasis on recycling and composting, and a continuing over-reliance on landfill. The net disposal cost is currently of the order £44 per tonne. This figure will increase in future and is likely to exceed £60 per tonne in the next decade. The emphasis in service provision needs to shift from the provision of refuse collection with low frequency recycling services, to the provision of high quality collection systems for recycling and composting, preferably with reduced frequency collections for refuse. The current system, principally focused on how to manage refuse, would change into one where residual waste quantities are reduced, and resources are extracted for useful purposes from the waste stream (in line with what is suggested in the RWMS). We have tried to develop the bare bones of a strategy in this document and we hope it provides a basis for such a strategy. However, any strategy needs to be shaped by the views of citizens, and to have the commitment of Members so that officers are empowered to deliver it;

- **Some Critical Questions Needs to be Answered as Soon as Possible:**

  - **Will Calderdale partner with any other local authority?**
    It is critical to have an early answer to this question since without a clear

decision, the procurement process cannot get underway in a meaningful manner since no one knows who is going to procure the facility. If there is to be no partnering, then there is no option but to ensure that sites are designated through the waste development framework. If partnering is an option – and the decision must be made now as to whether it is or is not – then the implications for sites, facility choice and likely timing of the commissioning of the facility need to be (re-)considered;

- **What are the implications of Calderdale's waste strategy (see above) for the quantity of residual waste to be treated?**
  Unless there is a clear idea of how to approach the issue of waste management in a strategic manner, no one can confidently say what size of facility, and of what type, is appropriate for Calderdale (and its partner(s)), and what its strategy in terms of landfill allowances should be. Making decisions about residual waste in the absence of such information is likely to lead to specification of over-capacity, and to hesitancy amongst prospective bidders since they will not know what it is they are meant to be dealing with;

- **Will the Waste Development Framework designate new sites?**
  At least in part, the necessity of this depends upon the partnering question (some might say the question should be considered the other way round). At present, however, the approach appears to be to wait for the RSS to come forward with improved data on wastes needing to be managed. In this way, decisions are put off. There is no point in prevaricating where the identification of potential sites is concerned if, for example, it becomes clear that Calderdale is not going to simply 'continue landfilling' and seeks an alternative management route for residual waste within the Council area. Waste managers and waste planners should work together to identify sites with a view, potentially, to securing them in future. This applies not only to residual waste treatment options, but also to HWRCs and to biowaste treatment facilities (composting or anaerobic digestion);

- **What approach will Calderdale take to procurement should it choose to procure its own facility, and what will be the implications for financing?**
  This question needs to be considered in the context of the previous questions. The answer has implications both for scale and financing (and potentially, technology choice). If Calderdale is not to partner, it may seek to build in additional capacity in its facility to deal with non-municipal wastes. It could do this, subject to a suitable site being available, through, for example, a joint venture approach. Currently, however, thinking has not progressed very far in this area. Consequently, Calderdale may be very much 'on the back foot' if it finds it has to procure its own facility within Calderdale.

There are many different routes which the Council could, in theory, follow. In practice, however, it seems to us that the one obvious one is to procure services for Calderdale within Calderdale. Currently, the failure to make that decision is leading to loss of time and also to a lack of decision-making more generally. Calderdale's destiny is, it would

appear, in its own hands. Unless there are obvious reasons for not arriving at that conclusion, there is no good reason for not accepting that as the reality;

- IF Calderdale accepts that the reality is that it must procure its own services, we would argue that:
- Given the LATS situation potentially unfolding; and
- Given the time which procuring such services is likely to take,

then the following considerations are likely to be relevant:

- In the round, a treatment such as **aerobic stabilisation as a pre-treatment to landfilling** may have much to recommend it. It is technologically simple, it has low capital costs, and it should be capable of fairly swift construction. The key risk at the time of writing relates to the Environment Agency's assessment of the process outputs in terms of their biodegradability. A final decision on this matter is expected shortly. Another issue of relevance to Calderdale may be land-take requirements;

- Less land is likely to be required by **AD-based MBT facilities generating a stabilised biowaste**. Furthermore, more material is extracted for recycling and the environmental performance of the system is thereby improved considerably. However, the cost of such systems, especially at the scale under consideration, may be relatively high, especially if a high contribution to recycling is sought. The other issue is (as for aerobic stabilisation) the treatment of the residues under LATS;

- A treatment such as **autoclaving** may fare well. However, autoclaving is not 'a process' in and of itself. It needs to be coupled to other technologies, and there is still some uncertainty about how well the process will work at higher throughput of mixed residual wastes. Questions therefore remain about where the biomass output would be sent, and for what purpose;

- If time is of the essence, probably, **ATT and incineration** are not the best to consider since they are likely to take longer to construct and are more likely to lead to planning delays. The wisdom of considering either ATT or oscillating kiln technologies looks more questionable as time passes;

- **Facilities generating RDF** are, in the short- to medium-term, almost certainly dependent upon the existence of dedicated facilities to accept the output (because of the existing legislation covering co-incineration). As a result, these processes suffer the same problems in respect of time as do ATT and incineration unless a suitable facility can be found elsewhere;

- Obviously, **untreated landfill** has certain attractions. It is not about to 'go away'. It is, however, no longer a cheap strategy. Indeed, if Calderdale does not act, then it is likely to become a most expensive strategy.

Calderdale needs to act quickly to deliver quality services to its citizens and to avoid the possibility of heavy costs / fines arising though failure to act in response to the LATS.

Appendix XB

Survey Report to Assess Householder Participation of Kerbside Recycling Services across the District of Calderdale.

Prepared by Kerbside (Calderdale)
for
Calderdale MBC

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List of Tables

Executive Summary

Calderdale Metropolitan Borough Council commissioned a participation survey to be carried out on the two kerbside recycling service provider organisations, namely, Kerbside (Calderdale) and FOCSA. With agreement from CMBC and FOCSA, Kerbside (Calderdale) carried out the survey – with CMBC carrying out an independent monitoring role; FOCSA were privy to pre-survey planning meetings and helpfully contributed with the provision of detailed round schedules.

A householder participation survey was carried out in August and September 2005 over a six-week period, and monitored the set out rate (the number of service users on a particular day) and participation rate (the number of service users in a defined time period) over six collection rounds of varying participation (defined as low, medium and high participation). A summary of the survey results are tabulated below:

Table 1: Summary of Participation Survey Results (averaged %)

Round	**Set out (%)**	**Participation (%)**
FOCSA	20	35
Kerbside (Calderdale)	31	45
Overall	**26**	**40**

Introduction

Kerbside (Calderdale) has produced this householder participation survey report on behalf of Calderdale Metropolitan Borough Council (CMBC). The aim of this survey was to provide a quantitative assessment of kerbside recycling participation rates within the district. It is anticipated that a further survey will be undertaken following further promotional campaigns, and therefore an evaluation of these activities will be possible. There are two household recycling service providers within Calderdale:

1. **A service provided to 57 000 householders is provided by FOCSA, a private contractor collecting paper and glass using a kerbside box (for glass) and green bag scheme (for paper).**

2. **Some 25 000 householders are provided a service by Kerbside (Calderdale), a community based organisation. Kerbside (Calderdale) collects several materials including glass (separated by colour), paper, cardboard, cans, and textiles. Materials are separated and put into plastic bags before being placed within the kerbside box, thus plastic bags are also recycled.**

Both service providers separate materials at the kerbside using dedicated stillage vehicles keeping collected materials separated. Both organisations provide a fortnightly recycling collection.

A householder participation survey was carried out in August and September 2005 over a six-week period that monitored the set out rate (the number of service users on a particular day) and participation rate (the number of service users in a defined time period) over six collection rounds of varying participation (defined as low, medium and high participation).

Set-out survey: This is a simple count of households, per given round, setting out their container for a kerbside recyclable collection. This figure is divided by the total number of households monitored to give a set-out rate:

$$\frac{\textbf{No. Households participating in one}}{\textbf{No. Households monitored}} = \textbf{Set-out rate}$$

Participation survey: Not every participating household will set-out a container of recyclables every collection – the householder may be absent or may wait until the container is full. A more accurate figure can be derived from a participation survey, where set-out is recorded over more than one collection:

$$\frac{\textbf{No. Households participating at least once in monitoring}}{\textbf{No. Households monitored}} = \textbf{Participation rate}$$

Note: the participation rate cannot be smaller than any weekly set-out rate during the monitoring period. Participation is recorded over a period appropriate to the frequency of collection.

Rounds Covered

Three rounds for surveying were selected from both FOCSA and Kerbside (Calderdale) based upon low, medium and high participation. The rounds were intended to reflect a cross section of the district, but as no participation survey work had been carried out prior to this report, the selection of rounds were based upon organisational knowledge. Table 2 presents an overview of the rounds.

Table 2: Description of high, low and medium rounds.

	Level of Participation			
	High	**Medium**	**Low**	**Total**
FOCSA rounds	Boothtown	Pellon	Illingworth	
Households covered	2340	1288	1476	**5104**
Kerbside (Calderdale)	Mytholmroyd	Copley	Old Town	
Households covered	1093	985	606	**2684**

Total	**7788**

Note: for streets included within rounds, see appendices 1 - 6

Methodology

The survey methodology employed WRAP[78] guidelines for monitoring set out and participation.

"As a compromise between a fixed monitoring period regardless of frequency of collection (e.g. a four-week period) and monitoring a fixed number of collections regardless of time covered (e.g. four collections), the following monitoring periods are recommended:

Kerbside collection frequency	**Number of collections**	**Monitoring period**
Weekly	4 collections	4 weeks
Fortnightly	3 collections	6 weeks
Every four weeks/monthly	2 collections	8 weeks/2 months

This allows for the fact that householders may be absent or forget to set-out for in a particular collection. It is important that the monitoring period does not change over the course of the surveys, to allow valid comparison. Care should be taken to avoid bank holidays and other holiday periods. A participation survey therefore consists of more than a simple count. For each collection monitored, it is necessary to record which households set-out and which do not." (WRAP, Monitoring and evaluation of recycling communications campaigns p17)

Both FOCSA and Kerbside (Calderdale) operate a fortnightly collection frequency and therefore the survey was taken over three collections during a six-week period.

Kerbside (Calderdale) employed two surveyors on a part-time basis, who were able to evenly distribute the rounds for surveillance, ensuring that only one surveyor was responsible for monitoring any particular round.[79]

The survey was carried out by two surveyors with kerbside experience, contracted to Kerbside (Calderdale). Surveyors divided the rounds so that only one person surveyed a particular round.

Using a separate vehicle the surveyor moved ahead of the collection round and accounted for boxes presented at the kerbside. As some residents may not place their recycling out until they hear the lorry the surveyor remained close enough to the recycling crew to spot new presentations or residents not using the standard box. This also ensured that assisted collections (collections from elderly or disabled residents) were accounted for.

[78] Monitoring and evaluation of recycling communication campaigns
[79] See Timetable (Appendix7)

Households, not containers, were counted as some households set-out more than one recycling container. Likewise, the survey was not interested in what materials were presented nor quantities.

The surveyor utilised a combination of Dictaphone and pen and paper to record the survey data. This helped speed the survey work minimising effect on the collection crew. A full health and safety risk assessment was carried out before the participation survey began.

Summary of data

- **FOCSA and Kerbside (Calderdale) Participation Rates Per Week**

Table 3: Number of households presenting by week and round

Round	**Collection 1**	**Collection 2**	**Collection 3**
FOCSA High (No. presenting)	483	368	373
Participation (%)	**20.64**	**15.73**	**15.94**
FOCSA Medium (No. presenting	270	260	227
Participation (%)	**20.96**	**20.19**	**17.62**
FOCSA Low (No. presenting	368	312	293
Participation (%)	**24.93**	**21.14**	**19.85**
Kerbside (Calderdale) High (No. presenting	373	377	366
Participation (%)	**34.13**	**34.49**	**33.49**
Kerbside (Calderdale) Medium (No. presenting	372	358	318
Participation (%)	**37.77**	**36.35**	**32.28**
Kerbside (Calderdale) Low (No. presenting	161	126	172
Participation (%)	**26.57**	**20.79**	**28.38**

- *FOCSA and Kerbside (Calderdale) Participation Rates Per Round Summary*

Table 4: FOCSA set out and participation values (%)

Round	Set Out	Participation
FOCSA High (No.)	408	747
Percentage rate (%)	**17.44**	**31.92**
FOCSA Medium (No.)	252	475
Percentage rate (%)	**19.59**	**36.88**
FOCSA Low (No.)	324	522
Percentage rate (%)	**21.97**	**35.37**
No. FOCSA Households (average)	328	581
Percentage rate (%)	**19.66**	**34.72**

Table 5: Kerbside (Calderdale) set out and participation values (%)

Round	Set Out	Participation
Kerbside (Calderdale) High (No.)	372	520
Percentage rate (%)	**34.03**	**47.58**
Kerbside (Calderdale) Medium (No.)	349	485
Percentage rate (%)	**35.47**	**49.24**
Kerbside (Calderdale) Low (No.)	153	224
Percentage rate (%)	**25.25**	**36.96**
No. Kerbside (Calderdale) Households (average)	291	410
Percentage rate (%)	**31.58**	**44.59**

Table 6: Overall total presentation (FOCSA + Kerbside (Calderdale)

	Set Out	**Participation**
Households	310	496
	25.62%	**39.66%**

Conclusions

FOCSA collection rounds are typically larger than Kerbside (Calderdale). By restricting the materials collected to that of paper and glass and by not sorting between glass colour, FOCSA minimises the time involved in sorting on the vehicle. FOCSA also utilise a green reusable bag for the paper, which is easy to empty and return to the householder.

Kerbside (Calderdale) collect several materials including glass, paper, cardboard, cans, plastic bags and textiles which requires added time in sorting; also Kerbside (Calderdale) householders use plastic carrier bags to present their recycling.

Though FOCSA rounds are typically larger, set out and participation rates were at 20 and 35% respectively. Kerbside (Calderdale) rates were at 26 and 40% respectively.

Any errors within the survey are restricted to the identification of households participating and these may arise from for example:

- **Missing a box during surveyance**
- **Lack of a property number/name fixture makes identification difficult**
- **Flats/apartments may leave boxes in communal areas**
- **Householders may not leave their box near to their property**
- **Householders may share a box/boxes or there is a communal collection point.**

It was noted that the rounds surveyed also had contrasting participation levels within themselves i.e. one area of the round would have a high participation whereas another area's participation would be low/none.

Recommendations

This survey has been undertaken using a representative group of households. It provides detailed participation data and could be used for the basis for a focussed campaign to encourage further householder participation. Campaign success could be monitored with the collection of further data following any campaign. Data should be compared for the same months or quarters in different years. A good communications/education campaign will be indicated by higher year-on-year increases in the months and quarters following introduction.

Appendices

NB Appendices 1 to 7 lists, schedules, consultant address deleted for economy.

Appendix XC

Second Survey Report to Assess Householder Participation of Kerbside Recycling Services across the District of Calderdale: February – March 2006

Prepared by Kerbside (Calderdale)
for
Calderdale MBC

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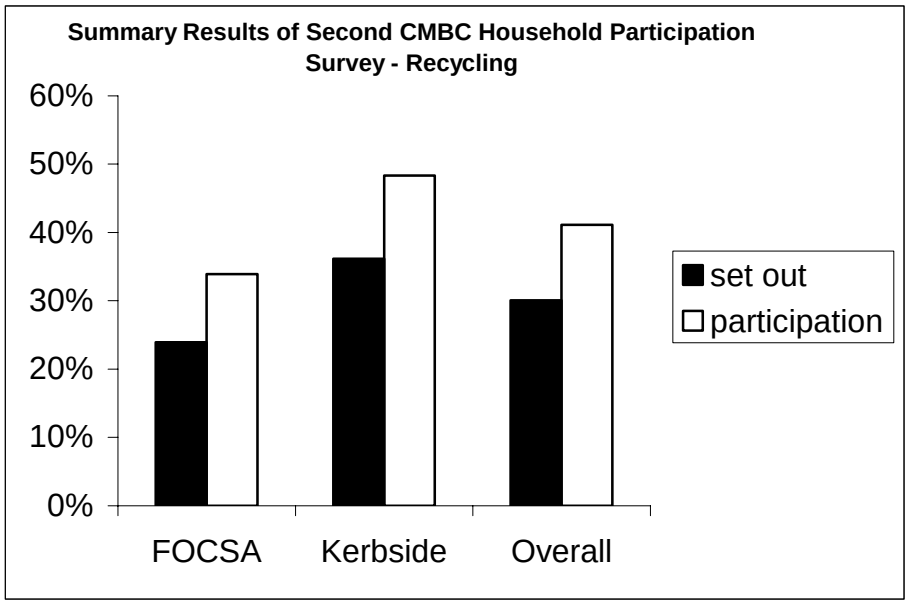
Executive Summary

Calderdale Metropolitan Borough Council (CMBC) commissioned a second household recycling participation survey over a six-week period during February and March 2006 using the same methodology as the first survey[80]. The survey monitored the set out rate (the number of service users on a particular day) and participation rate (the number of service users in a defined time period) over six collection rounds of varying participation (defined as low, medium and high participation).

Overall, householder participation is at 41.13%, which provides CMBC with an increased participation rate of 1.47% when compared to the same survey carried out in August and September 2005.

This report presents the results of the second survey of which findings are summarised below:

Fig 1. Summary of Participation Survey Results (averaged %) February – March 2006



[80] Kerbside (Calderdale) was commissioned to carry out a participation survey during August and September 2005. The methodology and results can be found in the report "Survey Report to Access Householder Participation of Kerbside Recycling Services across the District of Calderdale"

Introduction

This second participation survey during February and March 2006 replicated the initial survey of August and September 2005: A householder participation survey was carried out over a six-week period that monitored the set out rate (the number of service users on a particular day) and participation rate (the number of service users in a defined time period) over six collection rounds of varying participation (defined as low, medium and high participation).
These same three rounds were monitored based upon low, medium and high participation. The selection of rounds was based upon organisational knowledge. Table 1 presents an overview of the rounds.

Table 1: Description of high, low and medium rounds

	Level of Participation			
	High	**Medium**	**Low**	**Total**
FOCSA rounds	Boothtown	Pellon	Illingworth	
Households covered	**2352**	**1315**	**1527**	**5194**
Kerbside (Calderdale)	Mytholmroyd	Copley	Old Town	
Households covered	1119	998	629	**2746**
Total				**7940**

Note: The survey methodology employed WRAP guidelines for monitoring set out and participation[81]

During the first survey of August and September 2005 two surveyors were employed to carry out the research. For this second survey, just one surveyor was responsible to survey all of the rounds.

Using a separate vehicle the surveyor moved ahead of the collection round and accounted for boxes presented at the kerbside. As some residents may not place their recycling out until they hear the lorry the surveyor remained close enough to the recycling crew to spot new presentations or residents not using the standard box. This also ensured that assisted collections (collections from elderly or disabled residents) were accounted for.

Households, not containers, were counted as some households set-out more than one recycling container. Likewise, the survey was not interested in what materials were presented nor quantities.

[81] Monitoring and Evaluation of Recycling Communication Campaigns

The surveyor utilised a combination of Dictaphone and pen and paper to record the survey data. This helped speed the survey work minimising effect on the collection crew. A full health and safety risk assessment was carried out before the participation survey began.

FOCSA and Kerbside (Calderdale) Participation Rates Per Week

Summary of Data

Table 2: Number of Households Presenting by Week and by Round; Set Out and Participation Rates

FOCSA		Collection 1	2	3		Average (%) Set Out	Participation
High	No. Presenting	538	520	551		**536**	**659**
	Participation (%)	22.87	22.11	23.43		**22.80**	**28.02**
Medium	No. Presenting	371	358	378		**369**	**493**
	Participation (%)	28.21	27.22	28.75		**28.06**	**37.49**
Low	No. Presenting	434	429	97		**320**	**554**
	Participation (%)	28.42	28.09	6.35		**20.96**	**36.28**

Kerbside

High	No. Presenting	417	443	447		**435.67**	**595**
	Participation (%)	37.27	39.59	39.95		**38.93**	**53.17**
Medium	No. Presenting	403	384	356		**381**	**507**
	Participation (%)	40.38	38.48	88.34		**38.18**	**50.80**
Low	No. Presenting	207	180	205		**197.33**	**258**
	Participation (%)	32.91	28.62	32.59		**31.37**	**41.02**

Table 3:Overall total presentation comparison (average)

Round	**Set out (%)**	**Participation (%)**
FOCSA	23.94	33.93
Kerbside (Calderdale)	36.16	48.33

Table 4:Overall total presentation combined (average)

	Set out	Participation
Households	1095	481
Percent	30.05	41.13

Comparison of results (Survey 1 – 2)

4 Discussion

Overall, householder participation is at 41.13%, which represents an increase of 1.47%, **when compared to the same survey, carried out in August and September 2005. It is immediately noted that FOCSA low, collection 3 has a relatively low presentation and participation rate. This was due to the mechanical failure of the survey vehicle, part way through survey, and was unable to complete the round on that day.**

Table 5: Summary of First Participation Survey Results (averaged)

Round	Set out (%)	Participation (%)
FOCSA	19.66	34.72
Kerbside (Calderdale)	31.58	44.59
Overall	**26.62**	**39.66**

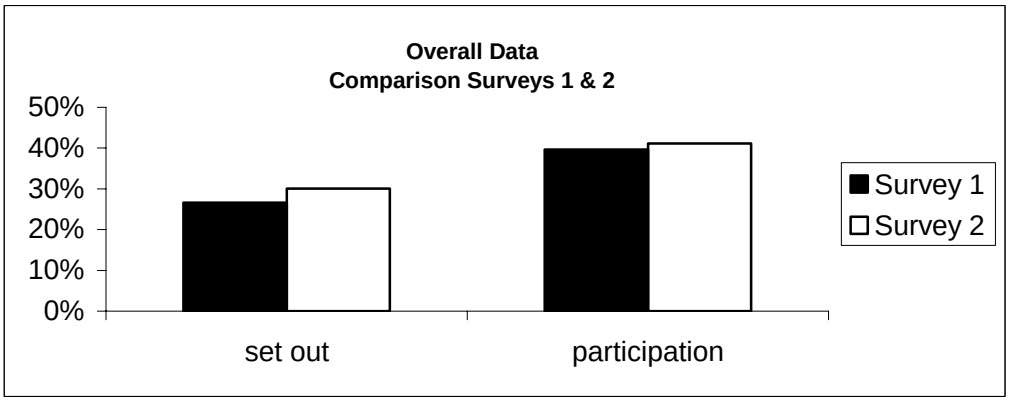
Table 6. Summary of Second Participation Survey Results (averaged)

Round	Set out (%)	Participation (%)
FOCSA	23.94	33.93
Kerbside (Calderdale)	36.16	48.33
Overall	**30.05**	**41.13**

Table 7. Comparison of Participation Survey Results (averaged)

	Set out	Participation
Survey 1	**26.62**	**39.66**
Survey 2	**30.05**	**41.13**

Fig 2: Survey Data Comparisons



5 Conclusion

It can be seen that in most cases both the set out and participation rates have increased. Even with the erroneous participation rate recorded against the FOCSA (low round, collection three) result as discussed earlier, the overall participation result is an increase of 1.47% of households participating in kerbside recycling schemes across Calderdale.

It should also be noted that there are also slight differences (increases) between the two surveys to date in regards to the household population. This may be attributed to factors such as changes in round, growth in round, surveyor error, and property new builds or incomplete data provision related to rounds.

Appendices

NB Appendices 1-6 Lists of extra streets deleted for economy.