



Waste Forecasting Report

**Derbyshire and Derby City Joint Municipal
Waste Management Strategy Review**

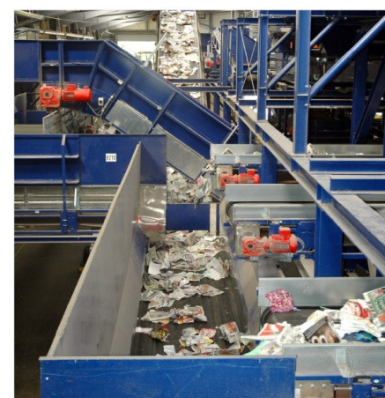
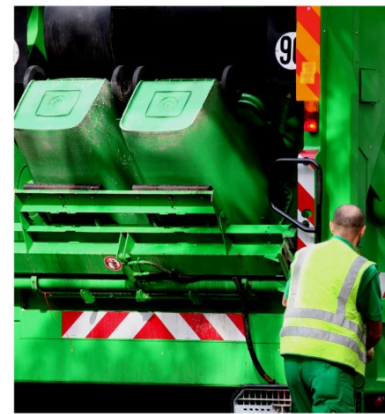
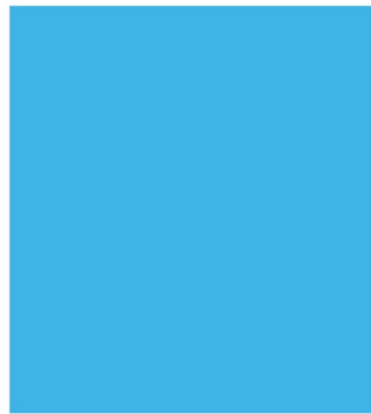
2013-2026

 **recycle**
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and Derbyshire

DERBYSHIRE WASTE PARTNERSHIP

Waste Forecasting Report

TO INFORM DEVELOPMENT OF THE JOINT
MUNICIPAL WASTE MANAGEMENT
STRATEGY





Derbyshire Waste Partnership – Waste Forecasting Report

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1 Introduction

To support the review of Derbyshire's Joint Municipal Waste Management Strategy, a review of trends in historical local authority collected municipal waste (LACMW¹) arisings and forecasting potential changes in future LACMW across the Derbyshire Waste Partnership² (DWP) area has been carried out.

In addition to forecasting LACMW arisings, the quantities of municipal waste within the commercial and industrial (C&I) waste stream has also been estimated. This has been prepared to provide an understanding of the potential material that may come under local authority control as the requirements of the revised Waste Framework Directive (WFD) are transposed in to UK legislation. The WFD requires all businesses to apply the waste hierarchy in the management of their waste, which could result in greater numbers of businesses requesting recycling services from local authorities.

Information from the C&I stream and LACMW stream has been analysed to provide a range of growth forecasts in order to inform the options development and appraisal process as part of the strategy. The range of growth forecasts can be used to assess the sensitivity of different delivery options to changes in waste arisings.

2 Local Authority Collected Municipal Waste (LACMW)

2.1 Historical LACMW Arisings

2.1.1 Total LACMW Arisings

In 2011/12, approximately 497,000 tonnes of municipal waste was produced across the DWP authorities. Comparing the 2011/12 LACMW figure with LACMW arisings going back to 2000/01, the 2011/12 LACMW arisings is the lowest figure over the 12 year period and closest to levels of LACMW arisings experienced in 2000/01 of around 502,000 tonnes. LACMW arisings over the last 12 years have shown a trend in line with the periods of economic growth and decline, see Figure 1 . However, other factors have influenced the figures including housing growth, local authority waste prevention activities, weather (that has impacted on the amounts of green waste) and the number of Easter Bank Holidays within a financial year. The largest percentage increase in comparison to the previous year was experienced in 2006/07 with a 3.4% increase from 2005/06. However, 2005/06 had the largest percentage decrease from the previous year of -3.9%, this is likely to be due to:

- there being no Easter in the 2005/06 financial year; and

¹ LACMW refers to the previous 'municipal' element of the waste collected by local authorities. That is household waste and business waste where collected by the local authority and which is similar in nature and composition as required by the Landfill Directive, Defra <http://www.defra.gov.uk/statistics/environment/waste/la-definition/>

² The Derbyshire Waste Partnership consists of Derbyshire County Council and its eight waste collection authorities and Derby City Council.

- the employment of an interim contractor to manage household waste recycling centres (HWRCs) who enforced tight restrictions on the types of waste that were accepted.

These factors mean that the figures around 2005/06 and 2006/07 are not a true representation of the general trend in LACMW arisings over the last 12 years.

Whilst LACMW arisings showed growth in the early 2000's comparing historical trends in the amount of LACMW since 2006/07, there has been a steady decrease in arisings year on year; with a 2% (~10,000 tonnes) reduction in LACMW arisings between 2010/11 and 2011/12 and a total reduction in arisings of 6.7% (~35,800 tonnes) over a six year period since 2006/07, see Table 1.

Potential reasons for these trends in arisings are discussed in subsequent sections.

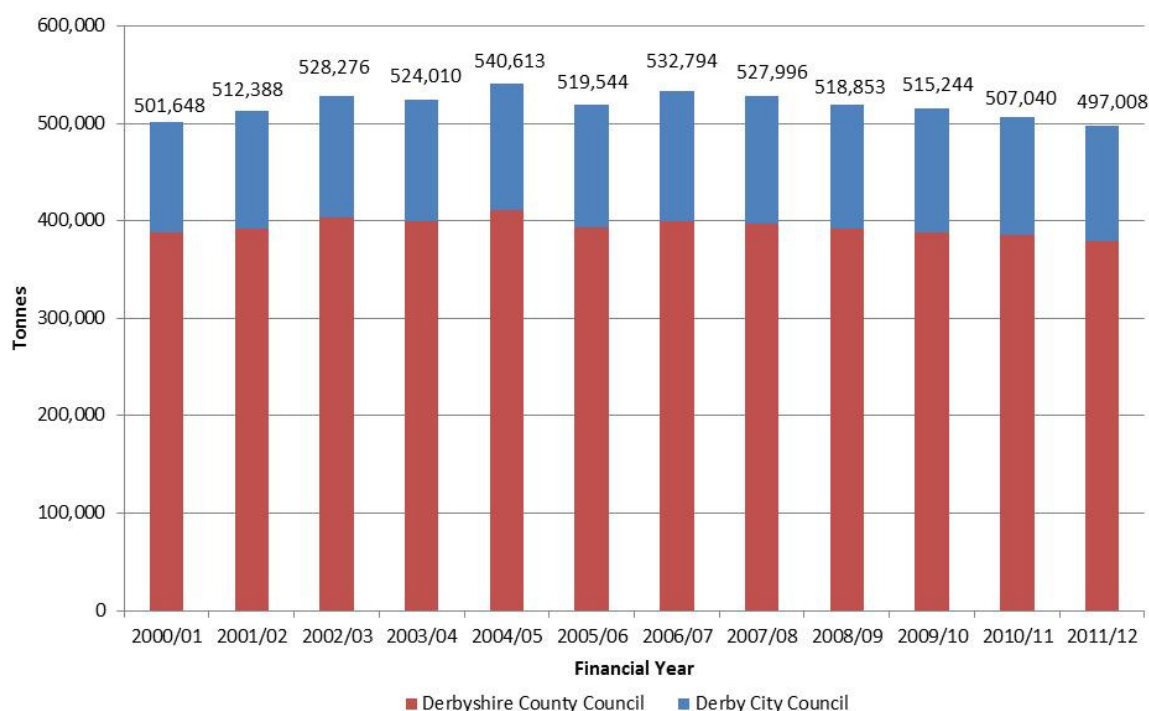
Table 1 DWP Local Authority Collected Municipal Waste and Household Arisings 2006/07 – 2011/12^{3,4}

Year	Total household waste	Total non-household waste	Total municipal waste	Municipal waste growth	Household waste growth	Number of Households	Waste per household (Tonnes/household/yr)
Derby City							
2006/07	122,881	10,153	133,034			103,172	1.19
2007/08	119,631	11,787	131,418	-1.2%	-2.6%	104,437	1.15
2008/09	111,331	16,035	127,366	-3.1%	-6.9%	105,114	1.06
2009/10	110,659	16,503	127,162	-0.2%	-0.6%	105,834	1.05
2010/11	106,824	15,040	121,864	-4.2%	-3.5%	106,500	1.00
2011/12	103,305	14,036	117,341	-3.7%	-3.3%	106,900	0.97
Derbyshire County Council							
2006/07	371,368	28,392	399,760			335,653	1.11
2007/08	369,913	26,665	396,578	-0.8%	-0.4%	338,526	1.09
2008/09	361,852	29,635	391,487	-1.3%	-2.2%	341,130	1.06
2009/10	360,828	27,254	388,082	-0.9%	-0.3%	342,816	1.05
2010/11	356,437	28,739	385,176	-0.7%	-1.2%	344,710	1.03
2011/12	349,370	30,297	379,667	-1.4%	-2.0%	346,190	1.01
Total - Derbyshire Waste Partnership							
2006/07	494,249	38,545	532,794			438,825	1.13
2007/08	489,544	38,452	527,996	-0.9%	-1.0%	442,963	1.11
2008/09	473,183	45,670	518,853	-1.7%	-3.3%	446,244	1.06
2009/10	471,487	43,757	515,244	-0.7%	-0.4%	448,650	1.05
2010/11	463,261	43,779	507,040	-1.6%	-1.7%	451,210	1.03
2011/12	452,675	44,333	497,008	-2.0%	-2.3%	453,090	1.00

³ Total figures were derived by taking the quarterly data from each district and calculating annualised totals. There are small tonnage discrepancies of no greater than 0.29% between the sum of the districts and the total reported LACMW for DCC, over the same period definition changes related to BVPIs and NIs have occurred which may be contributing to these discrepancies. Quarterly rolling data was used to assess historical trends in order to compare calendar year data with financial year data. Published WasteDataFlow data for 2010/11 and 2011/12 was not available at the time of writing this report so data was taken from DCC & Derby City Council.

⁴ Source: Derbyshire County Council

Figure 1 DWP Local Authority Collected Municipal Waste Arisings 2000/01 – 2011/12⁵

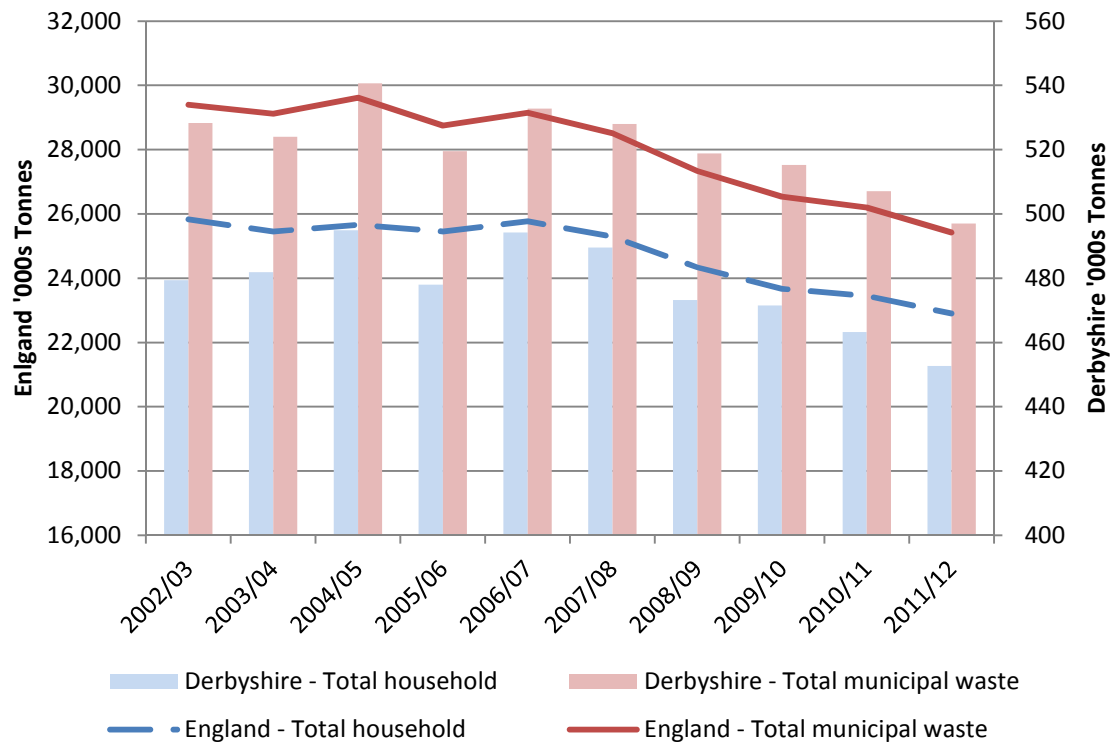


2.1.2 Household Waste Arising

The total household waste arisings show a similar trend to LACMW and the national household waste statistics, see Figure 2. Between 2006/07 and 2011/12 there has been a year on year decrease in the total LACMW, with a 2.3% (~10,600 tonnes) reduction in household waste arisings between 2010/11 and 2011/12 and a total reduction in household arisings of 8.4% (~41,600 tonnes) over a six year period since 2006/07, see Table 1. This table shows the biggest decrease in tonnes per household/year being experienced between 2007/08 and 2008/09, with the lowest level of household waste generated at 1 tonne/household/year in 2011/12. This decrease is primarily due to the recession affecting householder's spending habits and associated levels of waste arisings. To a lesser degree, waste minimisation activities being implemented by local authorities across Derbyshire to reduce waste arisings have also been a factor. The decline in household waste is consistent with the national trend for England from 2006/07. Since early 2000's there has been a significant change in householder behaviour and policies e.g. the Landfill Allowance Trading Scheme (LATS) and waste prevention campaigns such as Love Food Hate Waste which have all driven changes in the approach to the collection of waste and quantities of waste generated. Changes to household waste arisings are also commonly linked to changes in household numbers.

⁵ Source: Derbyshire County Council

Figure 2 A comparison of DWP Household Waste and total Local Authority Collected Municipal Waste Arising with national data 2002/03 – 2011/12⁶



2.1.3 Non-Household Waste Arising

The non-household waste stream e.g. trade waste, municipal parks and grounds maintenance waste of LACMW shows a more erratic trend than the household waste stream over the period 2006/07 to 2011/12. With the lowest amount (~38,450 tonnes) of non-household waste being collected in 2007/08. Over the last three years levels of non-household waste have remained reasonably constant at around 44,000 tonnes per year. Non-household waste arisings in waste collection authorities is largely influenced by the level of trade waste collected, the largest increase in non-household waste arisings is as a result of Derby City Council's increase in commercial waste collections and increases in stone and rubble delivered to the Partnership's Household Waste Recycling Centres (HWRCs). However, non-household waste remains overall a low percentage of LACMW at around 9%.

⁶ England data - Defra Municipal Waste Statistics <http://www.defra.gov.uk/statistics/environment/waste/wrfg23-wrmsannual/>. Derbyshire data source Derbyshire County Council

Table 2 DWP Non-Household Waste Arising 2006/07 – 2011/12⁷

Local Authority	Non-household (Tonnes per annum)					
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Amber Valley Borough Council	3,585	3,437	3,350	2,962	2,769	2,791
Bolsover District Council	1,545	1,400	1,593	1,549	1,579	1,622
Chesterfield Borough Council	4,004	3,638	3,479	3,419	3,309	3,543
Derbyshire Dales District Council	2,311	2,352	2,223	2,271	2,076	2,256
Erewash Borough Council	2,710	2,350	2,051	1,930	1,877	1,996
High Peak Borough Council	4,483	4,433	4,613	4,842	4,355	4,859
North East Derbyshire District Council	1,939	2,110	2,276	2,199	2,173	2,417
South Derbyshire District Council	1,262	1,243	1,225	1,157	996	1,360
DCC - HWRCs	6,554	5,703	8,826	6,925	9,605	9,453
Total Derbyshire County Council	28,392	26,665	29,635	27,254	28,739	30,297
Derby City Council	10,153	11,787	16,035	16,503	15,040	14,036
TOTAL DWP	38,545	38,452	45,670	43,757	43,779	44,333

2.2 Future LACMW Arisings

Future waste arisings are primarily linked to two main factors:

- the state of the country's economy, as economic decline and growth directly affect public consumption and purchasing habits which results in changes to the waste generated per household; and
- changes in household numbers (and to a lesser extent population), as increases in housing numbers result in a greater number of households generating waste.

In addition, there are several policy and regulatory initiatives designed to impact on future waste streams, including:

- producer responsibility initiatives for packaging, recently extended to other products, e.g. batteries, electrical goods and electronic equipment and vehicles;
- waste prevention initiatives (e.g. light-weighting of packaging within industry and commerce) and national and local campaigns to encourage the public to use food and resources more efficiently and reduce the waste they generate;
- possible effects of end-markets for recycled materials; and
- increased collections and services for recycling and composting.

Therefore, when selecting long-term growth/reduction rates there is a need to consider:

- potential reduction in waste growth (or absolute reduction in waste arisings), as a result of the factors described above;
- factors that have, or will, distort trend analysis such as a change of collection systems, legislation (e.g. Landfill Tax), seasonal factors (e.g. exceptionally dry

⁷ Source: Derbyshire County Council

years result in lower levels of garden waste) and changes resulting from local government reorganisation; and

- the elements of the waste stream to be included or excluded in the trend analysis to ensure consistency (e.g. exclusion of trade waste and grounds maintenance waste).

2.2.1 Future Household Waste Arising

In order to forecast future household arisings up to 2030/31 both the trends in past arisings and the trends in waste generated per household for LACMW at the district council level was analysed, to understand how waste generation has changed from 2006/07 to 2011/12. In addition the trend in the LACMW at the partnership level was assessed from 2002/03.

Using the analysis of past trends, a series of growth scenarios were developed, which considered:

- housing and population changes anticipated over the duration of the strategy;
- economic forecasts/impact of the recession;
- the potential implications of waste prevention initiatives ;
- the waste growth assumptions in the residual waste procurement base case.

Housing and population changes

The potential housing and population changes by local authority area were determined by reference to “Forecasts of population and household for Nottinghamshire and Derbyshire authorities” a report published by Edge Analytics Ltd in February 2011⁸.

Two scenarios of household growth were adopted from this report:

- the ‘SNPP’ scenario which replicates 2008-based Sub-National Population Projections using all SNPP assumptions on births, deaths and migration.
- the ‘Dwelling led’ scenario which uses a forecast of new dwelling developments based upon average completions 2001 - 2010.

Waste per household changes

In order to look at the potential future changes in waste per household, the following factors were considered:

- impact of the economic recession in recent years and the fact that the decrease in waste arisings experienced in the last few years may not continue;
- potential implications of waste prevention initiatives, though any changes may not have sustained year on year cumulative effect for the duration of the strategy;

⁸ The figures from the Edge Analytics report for ‘Dwelling Led’ and ‘SNPP’ household forecasts are in line with preferred growth strategies recently published by councils. South Derbyshire’s Preferred Growth Strategy, October 2012 suggest that from the period 2008 – 2028 - 33,700 additional dwellings are required across South Derbyshire, Amber Valley and Derby City. Figures used as part of the waste forecasting for dwelling led and SNPP forecast across these three council areas have considered an increase of 29,600 – 42,500 households.

- policy and regulatory initiatives outlined in Section 2.2.

Based on the above factors, the following growth scenarios were developed based on a percentage change per annum per household:

- no change in waste per household from 2011/12 levels;
- 0.25% per annum increase in waste per household from 2012/13;
- 0.5% per annum decrease in waste per household from 2012/13;
- 1.0% per annum decrease in waste per household from 2012/13.

Residual waste procurement base case waste growth assumptions

Derbyshire County Council and Derby City have procured a long term waste management contract. To inform the assessment of treatment facility capacity by bidders during the procurement process a base case model was developed. The waste growth assumptions used in the model were derived from the net value of the increase in households (taken from the 'SNPP' scenario of the report "Forecasts of population and household for Nottinghamshire and Derbyshire authorities" published by Edge Analytics Ltd in February 2011) and an annual decrease in arisings of 0.5% per annum as a result of waste minimisation activities. Further information on assumed growth rates is provided in Appendix A.

Based on the above, a total of eleven scenarios of how household waste arisings may change in the future were produced:

- **Scenario 1** - Variation over time in level of waste arising following linear trend in historic waste arisings from 2006/07 to 2011/12;
- **Scenario 2** – 'Dwelling led' household forecasts based on 2011/12 waste per household;
- **Scenario 3** – 'SNPP' led household forecasts based on 2011/12 waste per household;
- **Scenario 4** – 'Dwelling led' household forecasts based on 0.25% growth per annum in waste per household from 2012/13;
- **Scenario 5** – 'SNPP' led household forecasts based on 0.25% growth per annum in waste per household from 2012/13;
- **Scenario 6** – 'Dwelling led' household forecasts based on 0.5% reduction per annum in waste per household from 2012/13;
- **Scenario 7** – 'SNPP' led household forecasts based on 0.5% reduction per annum in waste per household from 2012/13;
- **Scenario 8** – 'Dwelling led' household forecasts based on 1.0% reduction per annum in waste per household from 2012/13;
- **Scenario 9** – 'SNPP' led household forecasts based on 1.0% reduction per annum in waste per household from 2012/13;
- **Scenario 10** - Procurement base case waste growth assumptions;

- **Scenario 11** - Variation over time in level of waste arising following linear trend in historic waste arisings from 2002/03 to 2011/12.

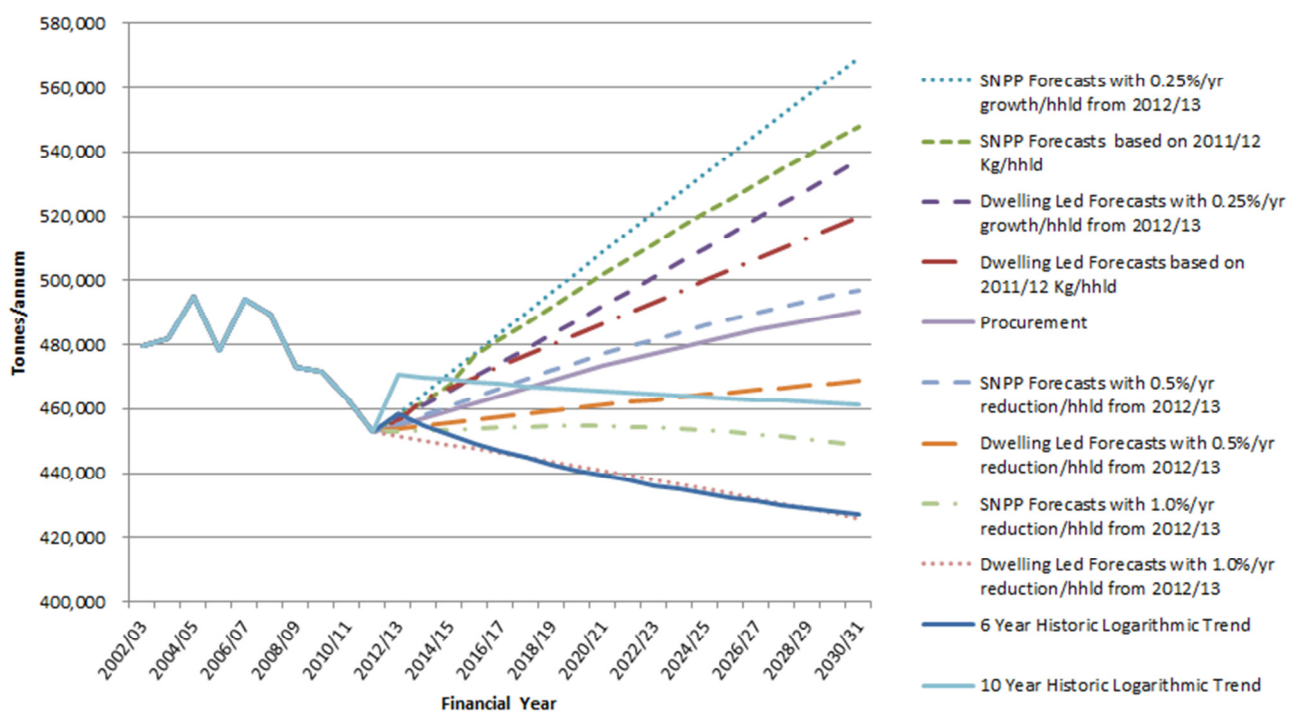
Based on the above assumptions household waste is predicted to change from 452,700 tonnes in 2011/12 to between 425,900 – 569,300 tonnes/annum by 2030/31 (see Table 3), which represents a change in LACMW arisings of between -6% to +26% over the period, see Table 3. The average of the eleven scenarios projects arisings of approximately 490,300 tonnes in 2030/31, which closely mirrors Scenario 10 - 'procurement' forecast and Scenario 7 - 'SNPP' led household forecasts based on 0.5% reduction per household per annum, see 0.

Table 3 Household Waste Forecasts 2011/12 – 2030/31 for different Scenarios⁹

Scenario		Actual	Household Forecast (Tonnes)				
		2011/12	2015/16	2020/21	2025/26	2030/31	
1	5 Year Historic Logarithmic Trend	452,676	449,200	439,300	432,400	427,100	
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	452,676	469,900	486,600	503,300	519,900	
3	SNPP Forecasts based on 2011/12 Kg/hhld	452,676	476,600	501,900	525,600	547,700	
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	452,676	470,100	492,200	514,700	537,600	
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	452,676	477,200	508,900	539,600	569,300	
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	452,676	456,700	461,200	465,200	468,700	
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	452,676	463,600	477,000	488,000	496,700	
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	452,676	447,600	440,800	433,500	425,900	
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	452,676	453,900	454,600	452,700	448,500	
10	Procurement	452,676	461,800	473,300	482,900	490,300	
11	10 Year Historic Logarithmic Trend	452,676	468,400	465,500	463,300	461,500	
	Minimum		447,600	439,300	432,400	425,900	
	Maximum		477,200	508,900	539,600	569,300	
	Average		463,182	472,845	481,927	490,291	

⁹ The waste forecast scenarios take account of predicted housing growth. Therefore, whilst a scenario may assume a percentage reduction in the waste/household/annum, the overall waste arisings may still increase over time as housing growth has been factored in.

Figure 3 DWP Household Waste Forecast 2002/03 – 2030/31



2.2.2 Future Non-Household Waste Arising

As discussed in Section 2.1.3, non-household waste across the DWP represents around 9% of the total LACMW. Historically, the Landfill Allowance Trading Scheme (LATS) created a disincentive for local authorities to collect commercial waste as this added to the amount of LACMW to be diverted from landfill. However, the Government has announced the end of the LATS after 2012/13. In addition, Defra's "Government Review of Waste Policy in England 2011", published in June 2011, outlined policies which are designed to encourage local authorities to increase collection of commercial waste for recycling and to provide or facilitate provision of infrastructure for the treatment of commercial and industrial waste.

There are a number of factors, in addition to the above, which will affect the quantities of non-household waste collected by local authorities across Derbyshire in the future, these include:

- impact of the recession on number, type of businesses and productivity/levels of waste generated;
- level of commercial waste service local authorities want to deliver;
- number of small and medium enterprises (SMEs) in different local authorities;
- nature and drivers of business types e.g. what their business activities are and the type of waste they generate;
- policy drivers, outlined in Section 2.2, related to packaging e.g. light weighting of packaging;

- private sector waste collection companies seeking to maintain market share of commercial waste collections.

Based on the above factors, it is difficult to forecast any significant increase or decrease in the quantity of non-household waste collected by the Derbyshire authorities. It has therefore been assumed that the tonnage of non-household waste will remain constant at 2011/12 levels of 44,300 tonnes in each of the scenarios, see Table 2.

2.2.3 Future Total LACMW Arising

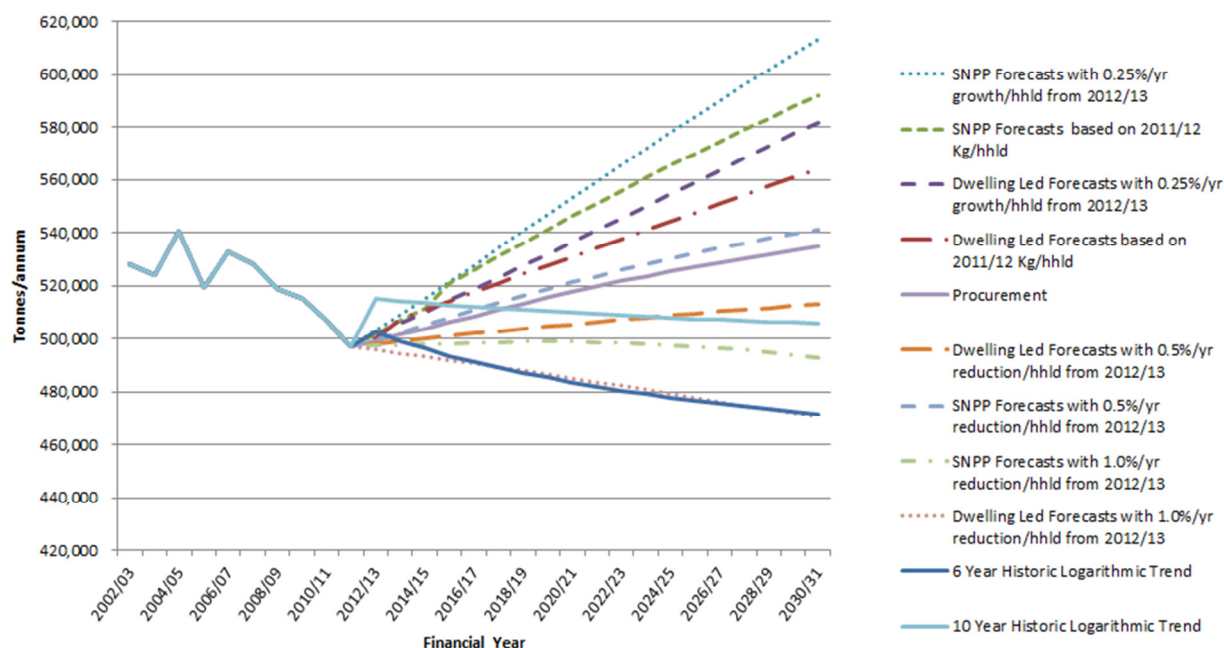
In order to forecast future LACMW across the DWP, the arisings from the eleven household scenarios in Section 2.2.1 were combined with the non-household 'no change' arisings detailed in Section 2.2.2, to generate total LACMW forecasts until 2030/31 depicted in Table 4 and Figure 4 .

Based on the above assumptions total LACMW waste is predicted to change from 497,000 tonnes in 2011/12 to between 470,200 – 613,600 tonnes/annum by 2030/31 (see 0), which represents a change in LACMW arisings of between -5% – +23% over this period. The average of the eleven scenarios projects arisings of approximately 534,600 tonnes in 2030/31, which closely mirrors Scenario 10 - 'procurement' forecast and Scenario 7 - 'SNPP' led household forecasts based on 0.5% reduction per annum, see Table 4.

Table 4 LACMW Forecasts 2011/12 – 2030/31 for different Scenarios

Scenario		Actual	Total LACMW Forecast (Tonnes)			
		2011/12	2015/16	2020/21	2025/26	2030/31
1	5 Year Historic Logarithmic Trend	497,009	493,600	483,600	476,700	471,400
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	497,009	514,300	531,000	547,600	564,300
3	SNPP Forecasts based on 2011/12 Kg/hhld	497,009	520,900	546,300	570,000	592,000
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	497,009	514,400	536,500	559,000	581,900
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	497,009	521,500	553,200	583,900	613,600
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	497,009	501,000	505,500	509,500	513,000
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	497,009	507,900	521,300	532,300	541,100
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	497,009	491,900	485,100	477,900	470,200
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	497,009	498,200	498,900	497,000	492,900
10	Procurement	497,009	506,100	517,600	527,200	534,700
11	10 Year Historic Logarithmic Trend	497,009	512,700	509,800	507,600	505,800
	Minimum		491,900	483,600	476,700	470,200
	Maximum		521,500	553,200	583,900	613,600
	Average		507,500	517,164	526,245	534,627

Figure 4 DWP Total LACMW Waste Forecast 2002/03 – 2030/31



A further breakdown between Derbyshire County Council and Derby City Council is provided in Appendix B. Data by individual local authority is available in the excel spreadsheet 'Derbyshire Waste Forecasting LACMW December 2012'.

3 Commercial & Industrial Waste Arising

Compared to LACMW, there is less detailed information on Commercial and Industrial (C&I) waste available at the local authority level. Therefore, in order to estimate the quantities of C&I waste within the DWP and the split of waste by waste type using substance-oriented classifications (SOCs)¹⁰, the following published reports were referred to:

- Defra - Commercial and Industrial Waste Survey 2009, May 2011 (Jacobs)
- East of England Regional Assembly - National Study into Commercial and Industrial Waste Arisings 2006/07, April 2009 (ADAS).

The latest report published by Defra in 2011 does not contain data at the local authority waste planning authority (WPA) level. Using information from the above reports, three sets of waste arising figures were calculated for the DWP and the Derbyshire County Council and Derby City Council areas by SOC. This included:

- 1 Taking the actual arisings by WPA and SOC from the ADAS Study.
- 2 Taking the percentage split of different SOC codes at the regional level from the Defra report to give the split of different SOC codes, then taking regional arisings from Defra data and apportioning tonnage based on the percentage

¹⁰ Substance Oriented Classification (SOC) is used for reporting European waste statistics as set out in The List of Wastes (England) Regulations 2005.

split of tonnages at the WPA level from ADAS Study to give a tonnage arising by WPA.

- 3 Taking the percentage split of different SOC codes at the WPA level from the ADAS Study. Then taking regional arisings from Defra data and apportioning tonnage based on the percentage split of tonnages at the WPA level from ADAS Study to give a tonnage arising by WPA. (This in effect gives a different SOC code split to the 2nd approach above).

Appendix C includes the detailed C&I arisings by WPA and SOC code based on these three approaches.

Analysis of the minimum and maximum tonnage from the three approaches for each WPA area, set out in Appendix C, suggests there was approximately 1.1 million tonnes of C&I waste arisings in 2011/12. The purpose of looking at C&I arisings is to assess potential material which may come under the local authority control in the future, therefore the specific SOC codes of interest, mixed (ordinary) waste, was identified as significant material of relevance for this study. Other SOC codes were discounted based on the typical physical properties of the waste and limited likelihood/ability to be collected through a local authority.

Analysis suggests that there was 133,500 – 228,000 tonnes of mixed (ordinary) waste arisings across the DWP in 2011/12. A growth rate of 1% per annum up to 2014/15 was applied to the C&I waste and 0% thereafter based on Derbyshire Planning/agreed regional growth rates. By 2030/31 mixed (ordinary) waste arisings across the DWP are forecast to be in the range 137,600 – 235,700 tonnes, see Table 5. Taking account of some of the discussion points outlined in Section 2.2.2, whilst some of this mixed (ordinary) waste will already be under local authority control, see Table 2, there is potential that increased quantities of mixed (ordinary) waste could fall under local authority control if additional businesses request a waste collection from a local authority or arrangements at HWRCs change in the future to accept commercial waste. However, it should be noted that the commercial waste management sector currently collects and manages much of this waste and is likely to continue to manage a significant proportion of this waste in the future.

Table 5 **Range of estimated C&I Arising Tonnages for ‘Mixed (Ordinary) Waste’ and Total C&I Waste (See Appendix C for full breakdown)**

Range of Tonnages by WPA	2011/12 (Tonnes)		2030/31 (Tonnes)	
	Mixed (ordinary) wastes	Total C&I Waste	Mixed (ordinary) wastes	Total C&I Waste
Derbyshire County Council				
Minimum	105,200	863,500	108,300	889,600
Maximum	153,900	868,200	158,600	894,500
Derby City Council				
Minimum	105,200	233,000	108,300	240,000
Maximum	74,900	234,200	77,200	241,300
Totals - Derbyshire Waste Partnership				
Minimum	133,500	1,096,400	137,600	1,129,600
Maximum	228,800	1,102,500	235,700	1,135,900

4 Summary and Conclusions

The following factors which have effected waste generation historically and those which are likely to impact on waste arisings in the future, have been considered throughout this report:

- national and local economic trends and conditions;
- household (and population) changes which result in an increase/decrease in total household waste arisings;
- changing consumption patterns which may lead to an increase/decrease in waste arisings per capita or per household;
- competition on trade waste collections from commercial waste management operators;
- policy and regulatory initiatives designed to impact on future waste streams, including:
 - producer responsibility initiatives for packaging, recently extended to other products, e.g. batteries, electrical goods and electronic equipment and vehicles;
 - waste prevention initiatives (e.g. light-weighting of packaging within industry and commerce) and national and local campaigns to encourage the public to use food and resources more efficiently and reduce the waste they generate;
 - possible effects of end-markets for recycled materials; and
 - increased collections and services for reuse, recycling and composting.

These factors will continue to influence waste arisings and therefore make accurate predictions very difficult. Therefore, in line with good practice, it is considered for waste strategy planning purposes that a band between Scenario 10 - 'procurement' forecast and Scenario 7 - 'SNPP' led household forecasts based on 0.5% reduction per annum, appear to be the most appropriate forecast for the Derbyshire Waste Partnership to use, see Figure 5 . Table 6 and Table 7 provide a breakdown of the household and LACMW figures for the forecasted range. However, it is important that the minimum and maximum forecasts projections are observed and a regular review of LACMW and C&I arisings in Derbyshire is carried out in order to monitor changes in trends throughout the strategy period to allow future decisions to be based on the best available information.

Figure 5 DWP Total LACMW Waste Forecast band based on Scenario 7 and 10

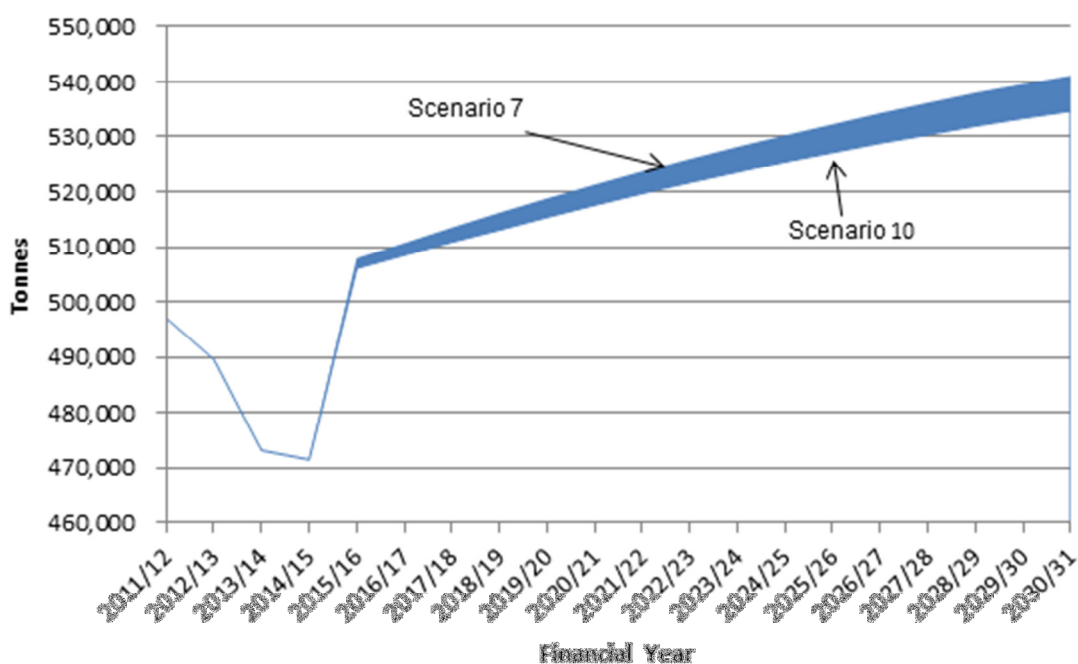


Table 6 Summary of Household Tonnage Forecasts for Scenario 7 'SNPP' led Household Forecasts and Scenario 10 'Procurement' Forecast

	Scenario	Household Waste	Tonnes						
			2002/03	2006/07	2011/12	2015/16	2020/21	2025/26	2030/31
Derby City Council	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	113,954	122,881	103,305	106,000	109,200	111,800	114,300
	10	Procurement				105,400	108,000	110,200	111,900
	Summary of 11 Scenarios	Minimum				100,400	95,500	92,200	89,600
		Maximum				112,200	118,500	124,500	131,800
		Average				106,364	108,264	110,145	112,036
Derbyshire County Council	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	365,466	371,368	349,370	357,600	367,800	376,200	382,500
	10	Procurement				356,400	365,300	372,700	378,400
	Summary of 11 Scenarios	Minimum				345,800	340,900	335,700	330,100
		Maximum				368,000	392,100	415,400	437,500
		Average				356,818	364,573	371,773	378,255
Derbyshire Waste Partnership	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	479,420	494,249	452,676	463,600	477,000	488,000	496,700
	10	Procurement				461,800	473,300	482,900	490,300
	Summary of 11 Scenarios	Minimum				447,600	439,300	432,400	425,900
		Maximum				477,200	508,900	539,600	569,300
		Average				463,182	472,845	481,927	490,291

Table 7 Summary of LACMW Tonnage Forecasts for Scenario 7 'SNPP' led Household Forecasts and Scenario 10 'Procurement' Forecast

	Scenario	LACMW	Tonnes						
			2002/03	2006/07	2011/12	2015/16	2020/21	2025/26	2030/31
Derby City Council	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	124,899	133,034	117,341	120,000	123,200	125,800	128,300
	10	Procurement				119,400	122,000	124,200	125,900
	Summary of 11 Scenarios	Minimum				114,400	109,500	106,200	103,600
		Maximum				126,300	132,600	138,500	145,800
		Average				120,400	122,291	124,164	126,073
Derbyshire County Council	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	403,377	399,760	379,667	387,900	398,100	406,500	412,800
	10	Procurement				386,700	395,600	403,000	408,700
	Summary of 11 Scenarios	Minimum				376,100	371,200	366,000	360,400
		Maximum				398,300	422,400	445,700	467,800
		Average				387,118	394,873	402,073	408,555
Derbyshire Waste Partnership	7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	528,276	532,794	497,009	507,900	521,300	532,300	541,100
	10	Procurement				506,100	517,600	527,200	534,700
	Summary of 11 Scenarios	Minimum				491,900	483,600	476,700	470,200
		Maximum				521,500	553,200	583,900	613,600
		Average				507,500	517,164	526,245	534,627

Appendix A Procurement Base Case Waste Growth Assumptions

Derbyshire County Council and Derby City have procured a long term waste management contract which involves the construction of a waste treatment facility. A waste flow model was provided by the Councils to inform the assessment of the treatment facility capacity by bidders during the procurement process.

Waste growth assumptions were derived from the report “Forecasts of population and household for Nottinghamshire and Derbyshire authorities” published by Edge Analytics Ltd in February 2011. The specific scenario adopted was the ‘SNPP’ scenario which replicates 2008-based Sub-National Population Projections using all SNPP assumptions on births, deaths and migration.

The project used a base case model in which the waste growth assumptions were derived from the net value of the increase in households (taken from the above report) and an annual decrease in arisings of 0.5% per annum as a result of waste minimisation activities.

The resulting waste growth factors which were assumed for each year of the Base Case are presented in Table A1.

■ **Table A1: Waste growth assumptions¹¹**

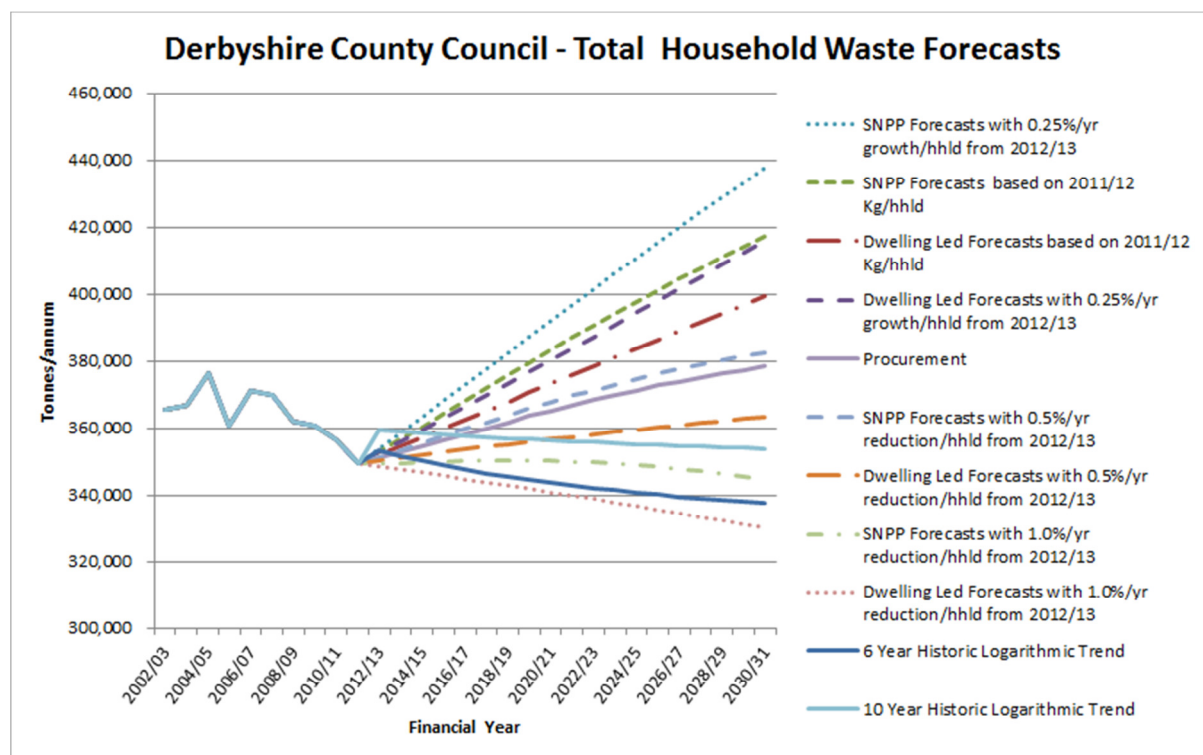
Year	Waste growth factor % per annum	Year	Waste growth factor % per annum
2010/11	0.00%	2021/22	0.45%
2011/12	0.46%	2022/23	0.42%
2012/13	0.49%	2023/24	0.40%
2013/14	0.49%	2024/25	0.39%
2014/15	0.50%	2025/26	0.36%
2015/16	0.52%	2026/27	0.34%
2016/17	0.51%	2027/28	0.32%
2017/18	0.51%	2028/29	0.32%
2018/19	0.49%	2029/30	0.29%
2019/20	0.49%	2030/31	0.26%
2020/21	0.46%	2031/32	0.23%

¹¹ 2012 03 20 note on Derbyshire waste forecasts, prepared by SKM Enviros for Derbyshire County Council

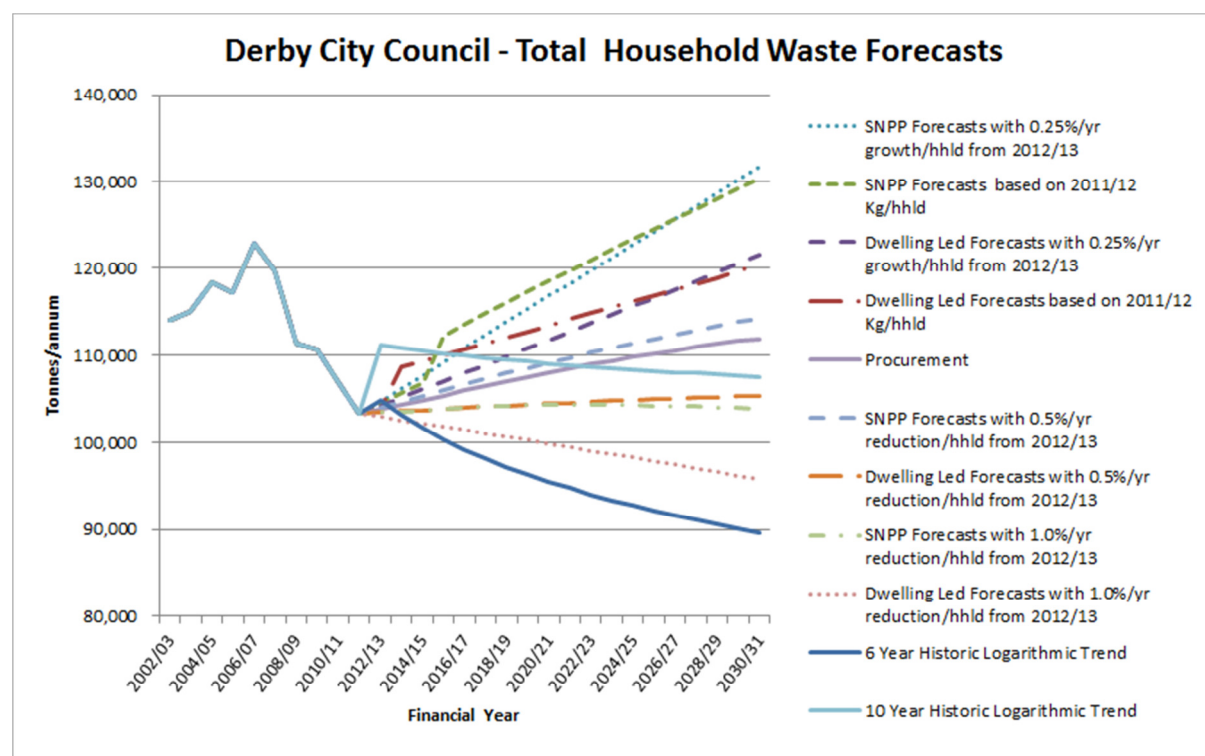
Appendix B Future Waste Growth Forecasts

Household Waste Forecasts

Scenario - Derbyshire County Council		Actual	Household Forecast (Tonnes)			
		2011/12	2015/16	2020/21	2025/26	2030/31
1	5 Year Historic Logarithmic Trend	452,676	348,900	343,800	340,200	337,500
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	452,676	360,000	373,200	386,400	399,600
3	SNPP Forecasts based on 2011/12 Kg/hhld	452,676	364,300	383,400	401,100	417,200
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	452,676	363,000	380,400	398,100	416,000
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	452,676	368,000	392,100	415,400	437,500
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	452,676	352,800	356,700	360,200	363,300
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	452,676	357,600	367,800	376,200	382,500
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	452,676	345,800	340,900	335,700	330,100
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	452,676	350,000	350,300	348,500	344,700
10	Procurement	452,676	356,400	365,300	372,700	378,400
11	10 Year Historic Logarithmic Trend	452,676	358,200	356,400	355,000	354,000
	Minimum		345,800	340,900	335,700	330,100
	Maximum		368,000	392,100	415,400	437,500
	Average		356,818	364,573	371,773	378,255

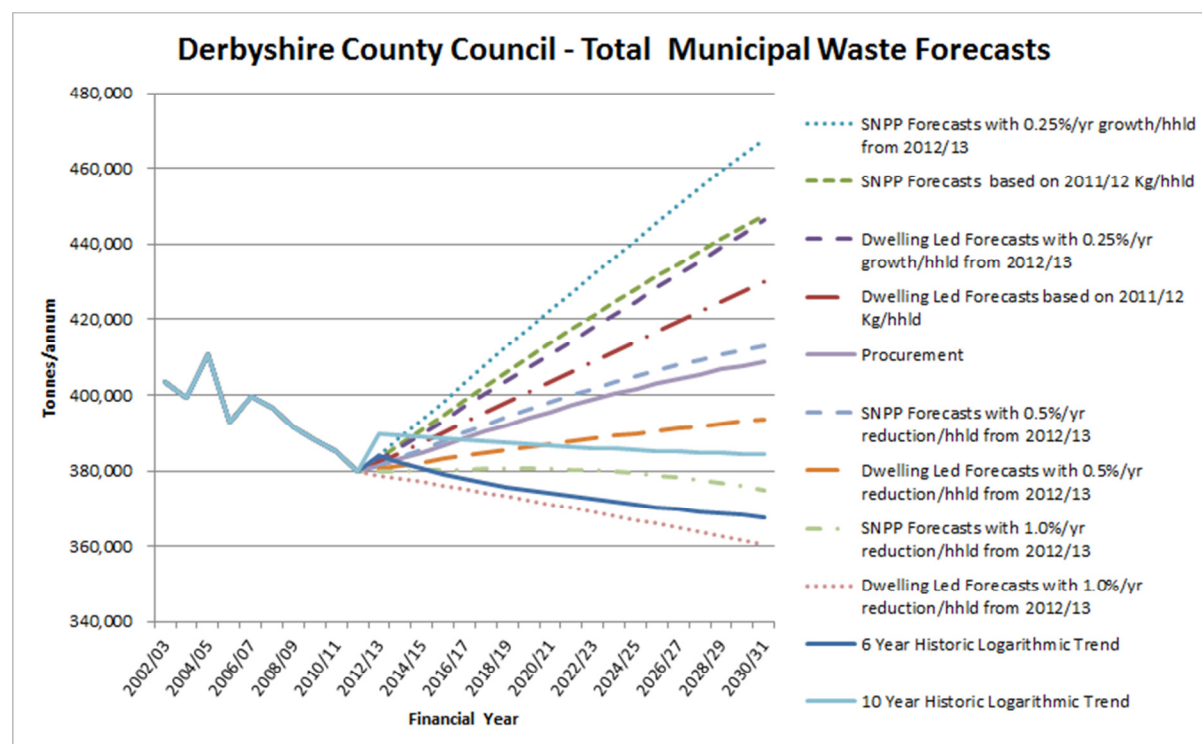


Scenario – Derby City Council		Actual	Household Forecast (Tonnes)			
		2011/12	2015/16	2020/21	2025/26	2030/31
1	5 Year Historic Logarithmic Trend	103,305	100,400	95,500	92,200	89,600
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	103,305	110,000	113,400	116,900	120,300
3	SNPP Forecasts based on 2011/12 Kg/hhld	103,305	112,200	118,500	124,500	130,400
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	103,305	107,000	111,800	116,600	121,600
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	103,305	109,200	116,800	124,200	131,800
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	103,305	103,900	104,500	105,000	105,400
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	103,305	106,000	109,200	111,800	114,300
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	103,305	101,800	99,800	97,800	95,800
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	103,305	103,900	104,300	104,200	103,800
10	Procurement	103,305	105,400	108,000	110,200	111,900
11	10 Year Historic Logarithmic Trend	103,305	110,200	109,100	108,200	107,500
Minimum			100,400	95,500	92,200	89,600
Maximum			112,200	118,500	124,500	131,800
Average			106,364	108,264	110,145	112,036

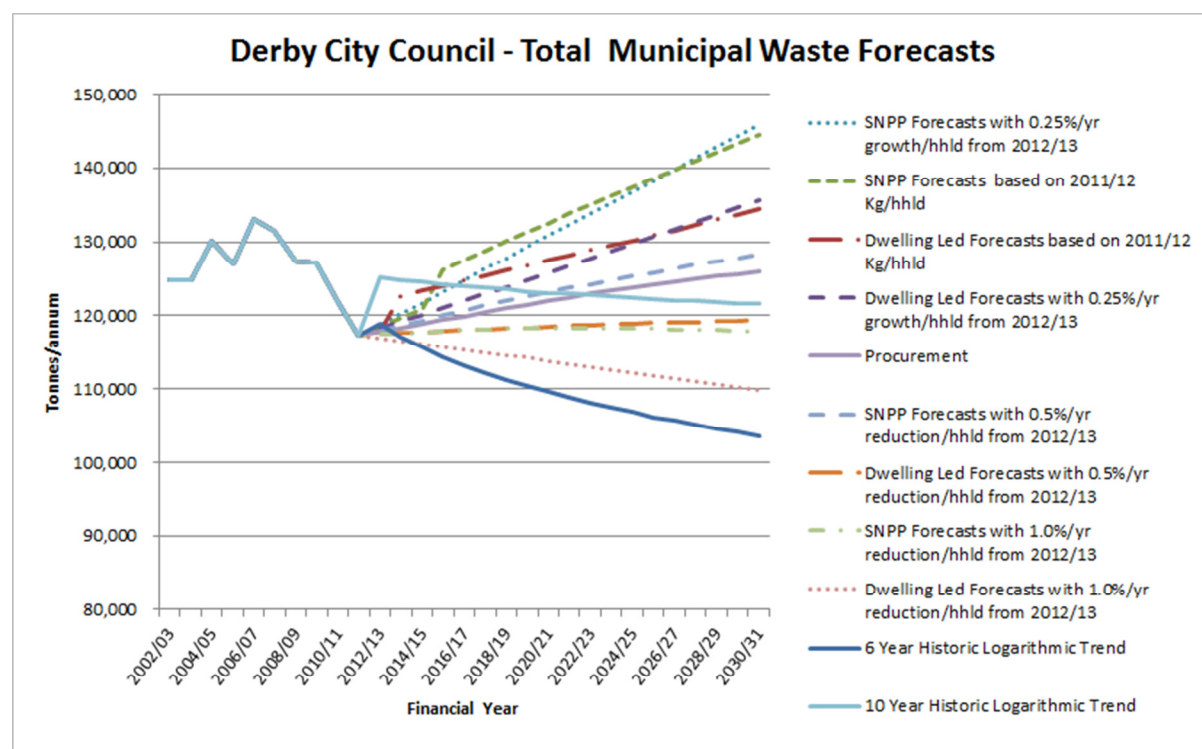


Total LACMW Forecasts

Scenario - Derbyshire County Council		Actual	Total LACMW Forecast (Tonnes)			
		2011/12	2015/16	2020/21	2025/26	2030/31
1	5 Year Historic Logarithmic Trend	379,667	379,200	374,100	370,500	367,800
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	379,667	390,300	403,500	416,700	429,900
3	SNPP Forecasts based on 2011/12 Kg/hhld	379,667	394,600	413,700	431,400	447,500
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	379,667	393,300	410,700	428,400	446,300
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	379,667	398,300	422,400	445,700	467,800
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	379,667	383,100	387,000	390,500	393,600
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	379,667	387,900	398,100	406,500	412,800
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	379,667	376,100	371,200	366,000	360,400
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	379,667	380,300	380,600	378,800	375,000
10	Procurement	379,667	386,700	395,600	403,000	408,700
11	10 Year Historic Logarithmic Trend	379,667	388,500	386,700	385,300	384,300
	Minimum		376,100	371,200	366,000	360,400
	Maximum		398,300	422,400	445,700	467,800
	Average		387,118	394,873	402,073	408,555



Scenario – Derby City Council		Actual	Total LACMW Forecast (Tonnes)			
		2011/12	2015/16	2020/21	2025/26	2030/31
1	5 Year Historic Logarithmic Trend	117,341	114,400	109,500	106,200	103,600
2	Dwelling Led Forecasts based on 2011/12 Kg/hhld	117,341	124,000	127,500	130,900	134,400
3	SNPP Forecasts based on 2011/12 Kg/hhld	117,341	126,300	132,600	138,500	144,500
4	Dwelling Led Forecasts with 0.25%/yr growth/hhld from 2012/13	117,341	121,100	125,800	130,600	135,600
5	SNPP Forecasts with 0.25%/yr growth/hhld from 2012/13	117,341	123,300	130,800	138,200	145,800
6	Dwelling Led Forecasts with 0.5%/yr reduction/hhld from 2012/13	117,341	117,900	118,500	119,000	119,400
7	SNPP Forecasts with 0.5%/yr reduction/hhld from 2012/13	117,341	120,000	123,200	125,800	128,300
8	Dwelling Led Forecasts with 1.0%/yr reduction/hhld from 2012/13	117,341	115,800	113,900	111,900	109,800
9	SNPP Forecasts with 1.0%/yr reduction/hhld from 2012/13	117,341	117,900	118,300	118,200	117,900
10	Procurement	117,341	119,400	122,000	124,200	125,900
11	10 Year Historic Logarithmic Trend	117,341	124,300	123,100	122,300	121,600
	Minimum		114,400	109,500	106,200	103,600
	Maximum		126,300	132,600	138,500	145,800
	Average		120,736	123,245	125,536	127,745



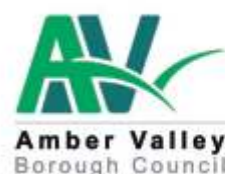
Appendix C C&I Arising Breakdown

Table A2: Total Estimated C&I breakdown (tonnes) by substance-oriented classifications (SOC) – note figures are not year specific and depend on survey date/publication of report

Area	Source	SOC									Total
		Animal & vegetable waste	Chemical wastes	Common sludges	Discarded equipment	Health care	Metallic wastes	Mineral wastes	Mixed (ordinary) wastes	Non-metallic wastes	
Derbyshire	ADAS National C&I Study 2006/07	69,889	176,244	73,950	5,455	7,557	51,665	53,069	223,627	164,637	826,095
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)	77,485	85,679	10,227	9,060	22,482	32,379	333,324	139,360	136,452	846,448
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)	71,611	180,586	75,772	5,590	7,744	52,938	54,377	229,136	168,693	846,448
Derby City	ADAS National C&I Study 2006/07	10,302	29,068	2,097	2,617	3,289	16,659	8,641	91,409	58,791	222,874
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)	20,905	23,115	2,759	2,444	6,065	8,736	89,928	37,598	36,814	228,365
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)	10,556	29,784	2,149	2,682	3,370	17,069	8,854	93,661	60,240	228,365
DWP Combined	ADAS National C&I Study 2006/07	80,192	205,312	76,048	8,073	10,846	68,324	61,710	315,036	223,428	1,048,968
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)	98,390	108,794	12,986	11,505	28,547	41,115	423,251	176,958	173,266	1,074,812
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)	82,167	210,371	77,921	8,272	11,114	70,007	63,231	322,797	228,933	1,074,812

Table A3: Total Estimated C&I waste and 'mixed (ordinary) waste' forecasts (tonnes)

All C&I Waste		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2030/31
	Growth Rate (Based on DCC Planning/agreed regional growth rates)		1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Derbyshire	ADAS National C&I Study 2006/07	826,095	834,356	842,699	851,126	859,638	868,234	876,916	885,685	894,542	894,542	894,542
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)				846,448	854,912	863,461	872,096	880,817	889,625	889,625	889,625
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				846,448	854,912	863,461	872,096	880,817	889,625	889,625	889,625
Derby City	ADAS National C&I Study 2006/07	222,874	225,102	227,353	229,627	231,923	234,242	236,585	238,951	241,340	241,340	241,340
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)				228,365	230,648	232,955	235,284	237,637	240,014	240,014	240,014
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				228,365	230,648	232,955	235,284	237,637	240,014	240,014	240,014
DWP Combined	ADAS National C&I Study 2006/07	1,048,968	1,059,458	1,070,053	1,080,753	1,091,561	1,102,476	1,113,501	1,124,636	1,135,883	1,135,883	1,135,883
	Defra - 1 (apportioned based on Defra SOC split at regional level and Defra arisings)				1,074,812	1,085,560	1,096,416	1,107,380	1,118,454	1,129,638	1,129,638	1,129,638
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				1,074,812	1,085,560	1,096,416	1,107,380	1,118,454	1,129,638	1,129,638	1,129,638
Commercial element of 'Mixed ordinary waste' waste streams of		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2030/31
	Growth Rate (Based on DCC Planning/agreed regional growth rates)		1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Derbyshire	ADAS National C&I Study 2006/07	146,448	147,912	149,391	150,885	152,394	153,918	155,457	157,012	158,582	158,582	158,582
	Defra - 1 (apportioned based on Defra National SIC against SOC split and Defra arisings)				103,085	104,115	105,157	106,208	107,270	108,343	108,343	108,343
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				150,056	151,556	153,072	154,603	156,149	157,710	157,710	157,710
Derby City	ADAS National C&I Study 2006/07	71,258	71,970	72,690	73,417	74,151	74,893	75,642	76,398	77,162	77,162	77,162
	Defra - 1 (apportioned based on Defra National SIC against SOC split and Defra arisings)				27,811	28,089	28,370	28,654	28,941	29,230	29,230	29,230
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				73,013	73,744	74,481	75,226	75,978	76,738	76,738	76,738
DWP Combined	ADAS National C&I Study 2006/07				224,302	226,545	228,811	231,099	233,410	235,744	235,744	235,744
	Defra - 1 (apportioned based on Defra National SIC against SOC split and Defra arisings)				130,896	132,205	133,527	134,862	136,211	137,573	137,573	137,573
	Defra - 2 (apportioned based on ADAS Study sub regional SOC split but Defra arisings)				223,069	225,300	227,553	229,828	232,127	234,448	234,448	234,448



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Visit www.derbyshire.gov.uk/wastestrategy or www.derby.gov.uk/bins for more information about reducing, reusing, recycling and composting or to find out more about dealing with Derbyshire and Derby's waste.