Wheelabrator TECHNOLOGIES

Deadline 3: Applicant's Response to the Examining Authority's Further Written Questions (ExQ1A)

Appendix 1.46b – WTI LACW Review - Hendeca

Wheelabrator Kemsley (K3 Generating Station) and Wheelabrator Kemsley North (WKN) Waste to Energy Facility Development Consent Order

PINS Ref: EN010083

Document 11.2

April 2020 – Deadline 3

1. Introduction

1.1 The WTI LACW Review

1.1.1 Dated 18 December 2017, KCC issued document titled 'Kent Waste Needs Assessment 2017, Updated Management Requirement for Local Authority Collected Waste Generated in Kent', version 1.3 (KCC LACW Need Assessment).

1.1.2 The KCC LACW Need Assessment is a key area of concern in the evidence base prepared to underpin the Partial Review. This report presents the WTI LACW Review, a comprehensive need assessment for LACW generated in Kent, which conforms to national guidance.

1.1.3 The following tasks have been undertaken:

- discussion of forecasting methodologies, making clear the correct way to undertake such an assessment and where the KCC LACW Need Assessment is inconsistent with national guidance (Section 2);
- data gathering/collation, including housing forecasts (Section 3);
- review of local authority systems and performance, to provide information on what is currently being achieved and enabling a comparison to be made against the treatment route forecasts within the KCC LACW Need Assessment (Section 4);
- scenarios of waste growth analysis based on the analysis of Kent's LACW data and subsequent forecasts of LACW arisings (Section 5); and
- conclusions of the resultant LACW management need (Section 6).

2. LACW Forecasting Methodologies

2.1 Introduction

2.1.1 Forecasting local authority waste arisings can be complex, with future waste arisings primarily linked to two main factors:

- the state of the economy; and
- changes in household numbers.

2.1.2 However, there are several policy and regulatory initiatives designed to impact on future waste generation, 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 to reduce the waste they generate;
- possible effects of end-markets for recycled materials; and
- increased collections and services for recycling and composting.

2.1.3 To enable a reasonable approach to work through these variables, guidance documents have been prepared by national government and resource management organisations. Those referenced in this Review are:

- Defra's A Practice Guide for the Development of Municipal Waste Management Strategies, 2005
- National Planning Practice Guidance: Waste, 2014
- WRAP's Recycling Managers Training Programme, 2004-2014

Defra's A Practice Guide for the Development of Municipal Waste Management Strategies (Defra's MWMS Practice Guide)

2.1.4 Defra's MWMS Practice Guide incorporates a series of Information Sheets; Information Sheet 8 addresses waste forecasting.

2.1.5 Information Sheet 8 highlights the need to analyse previous trends, where possible considering different parts of the waste stream e.g. collected household, trade waste etc. It next describes the process of developing the *Baseline Forecasts,* which can then be adjusted to take account of waste prevention and reuse initiatives.

2.1.6 Box 1 reproduces the process for preparing a baseline forecast, as set out in Information Sheet 8.

Box 1 Defra, MWMS Practice Guide, Information Sheet 8

Baseline Forecasts
Authorities should prepare a range of different forecasts for each waste stream and for each authority and select a central, best estimate forecast for use in strategy preparation.

These growth profiles should take account of:

- projected changes in waste per household (based upon analysis of previous trends, as discussed above);
- projected changes in population and household numbers (the local development framework, or input from planners regarding the currency of forecasts, should inform forward projections). This is particularly important for those areas where major new housing developments are expected;
- rate of development and economic growth.

Authorities should incorporate sensitivity analysis (high or low growth) around the best estimate and should keep this in mind when considering waste management capacity needs.

National Planning Practice Guidance: Waste

2.1.7 National Planning Practice Guidance on waste (NPPG: Waste) provides information in support of the implementation of waste planning policy. It includes guidance on how waste planning authorities should forecast municipal waste arisings when preparing growth profiles; this is reproduced in Box 2.[1]

Box 2 National Planning Practice Guidance: Waste

How should waste planning authorities forecast waste arisings?
Waste planning authorities should anticipate and forecast the amount of waste that should be managed at the end of the plan period. They should also forecast waste arising at specific points within the plan period, so as to enable proper consideration of when certain facilities might be needed. However, the right balance needs to be made between obtaining the best evidence to inform what will be necessary to meet waste needs, while avoiding unnecessary and spurious precision.

Paragraph: 028 Reference ID: 28-028-20141016

How should waste planning authorities forecast future municipal waste arisings?
Forecasts of future municipal waste arisings are normally central to the development of Municipal Waste Management Strategies.

It will be helpful to examine municipal waste arisings according to source (i.e. household collections, civic amenity site wastes, trade waste etc). This may allow growth to be attributed to particular factors and to inform future forecasts.

[1] https://www.gov.uk/guidance/waste accessed 3rd February 2018

A 'growth profile', setting out the assumed rate of change in waste arisings may be a useful starting point for forecasting municipal waste arisings. The growth profile should be based on 2 factors:

- household or population growth; and
- waste arisings per household or per capita.

Paragraph: 029 Reference ID: 28-029-20141016

How is a growth profile prepared?
A growth profile is prepared through a staged process:

- calculate arisings per head by dividing annual arisings by population or household data to establish short- and long-term average annual growth rates per household and
- factor in a range of different scenarios, e.g. constant rate of growth, progressively lowering growth rates due to waste minimisation initiatives.

The final forecast can then be modelled with scenarios based on the long- and short-term rate of growth per household, together with household forecasts.

Paragraph: 030 Reference ID: 28-030-20141016

WRAP Recycling Manager's Training Programme

2.1.8 The Training Manual supporting the Recycling Manager's Training highlights two main methods for estimating future arisings, these are summarised in Box 3.

Box 3 WRAP, Recycling Manager's Training

Method 1: Trends in past arisings
Comparison of the annual change in waste arisings over a number of years allows an estimate of the annual growth to be determined. This growth rate can then be applied to the current arisings to determine the likely future levels.

This method is calculated by:

1. **Collecting** historical waste arisings data (eg for the last five years);
2. **Obtaining** a breakdown if possible (household, non-household);
3. **Identifying** any anomalies;
4. **Selecting** an appropriate period over which the growth rate will be based; and
5. **Calculating** the growth rate.

For most authorities, historical waste arisings figures show that growth has not been linear (eg 1000 tonnes per annum every year) but compound, i.e. increasing by a larger tonnage each year (eg 1000 tonnes in the first year, 1100 tonnes in the second year and so on).

The calculation for this is:

Year 1 = Year 1 total
Year 2 = Year 1 total + (x% of Year 1 total)
Year 3 = Year 2 total + (x% of Year 2 total)

One drawback of this method is not understanding the reasons for past growth rates and hence basing future projections solely on past trends or events that may not be significant in the future (see Section 3.2.1 below).

Method 2: Trends in waste generated per household combined with growth in households
Comparison of the annual change in average waste generated per household allows the trend in waste generation to be estimated. An appropriate coefficient can then be determined and used to predict future arisings based on the total number of households. The estimated output per household (in kg per household per annum) is multiplied by future housing estimates in each year to predict the total future arisings.

This method requires both historic housing data and future estimates of household numbers. It enables waste arisings to be forecast on the basis of changes in the number of households and other factors.

Issues to consider in trend analyses

Waste output can be expected to increase, if households (and population) are projected to grow. However, economic growth and changing consumption habits will also influence waste production. Therefore the two key influences on waste arisings are:

- household (and population) growth which results in an increase in total household waste arisings; and
- changing consumption patterns which may lead to an increase in per capita or per household waste output.

In addition, there are several European and other initiatives designed to impact on future waste streams (see also Policy and Legislation Module), including:

- producer responsibility initiatives for packaging, recently extended to other products, eg batteries, electrical goods and electronic equipment, vehicles;
- waste minimisation initiatives (eg light-weighting of packaging) within industry and commerce;
- possible effects of end-markets for recycled materials; and
- local initiatives to promote waste recovery and recycling (eg introducing free bulky waste collections will increase the tonnage of waste collected at the kerbside by a local authority, but may reduce the quantity of these items deposited at HWRC).

Therefore, when selecting long-term growth (or reduction) rates:

- make allowance for potential reduction in waste growth, as a result of the factors described above;
- consider factors that have, or will, distort trend analysis such as a change of collection systems, legislation (eg Landfill Tax), seasonal factors (eg exceptionally dry years result in lower levels of garden waste) and changes resulting from local government reorganisation; and
- consider the elements of the waste stream to be included or excluded in the trend analysis to ensure consistency (eg exclusion of trade waste/sweepings).

2.2 Discussion

2.2.1 All three methods are based on the same principles i.e:

- analyse the **trends in waste generation** per capita or per household;
- the analysis should **consider different elements** of the waste stream;
- develop **a range of growth** profiles[2] considering projected changes in household / population and economic growth;

2.2.2 The KCC LACW Need Assessment has a number of areas of inconsistency and weakness when compared to the above national guidance on preparing waste forecasts:

1. It does not provide a clear analysis of the trends in waste generation per household and does not provide the actual tonnages (other than graphically) between years 2008/09 and 2015/16, so the quoted percentage changes cannot be calculated from the information provided. This is a general issue as the base data is not provided to allow it to be validated and subsequent calculations to be checked.
2. Significantly, it does not take account of a key factor that could distort trend analysis between 2008 and 2013; that the reduction in waste arisings between 2008 and 2013 are in part due to the national recession. It does mention the potential impact of recession on the baseline (Table 8) and states the impact on the baseline would be '*one-off and bounce back'.* However this appears to have been ignored in the subsequent analysis.
3. NPPG: Waste is quoted in relation to forecasting future arisings, at section 3.1.2 of the KCC LACW Need Assessment. However the analysis does not appear to have followed the guidance. The analysis has considered long and short-term growth rates for the change in waste per household but does not appear to consider the impact of housing growth, which is suggested in NPPG: Waste
'*The final forecast can then be modelled with scenarios based on the long- and short-term rate of growth per household, together with household forecasts*'. (Paragraph 030)
4. It appears to completely disregard growth in population, households or economic recovery and applies a generic growth rate based on outdated information that is not directly related to LACW generation in Kent. The KCC LACW Need Assessment presents a Defra waste forecast from the 2014 report 'Forecasting 2020 Waste Arisings and Treatment Capacity', which was produced to discuss Hertfordshire County Council's residual waste treatment project (the 2014 Hertfordshire Report). However, the use of this reference document in the KCC LACW Need Assessment highlights a significant misunderstanding of the information presented in the 2014 Hertfordshire Report. Figure 5 of the KCC LACW Need Assessment, which reproduces Figure 3 of the 2014 Hertfordshire Report, relates to the municipal waste element of the commercial and industrial (C&I) waste stream i.e. wastes from the C&I sector that are similar in nature to household waste. This graph does not include household waste, it is only the C&I fraction of municipal waste, and hence why the figure starts at around 16 million tonnes in 2010. In 2010/11, approximately 23.5 million tonnes of household waste was produced with the total LACW being 26.2 million tonnes. An explanation for use of the

[2] 'growth' should be taken to refer equally to increase, decline, or stasis in waste arisings

selected graph is provided (at footnote 11 of the KCC LACW Need Assessment) however, as explained, it is not a valid comparator for LACW.

5. The KCC LACW Need Assessment presents a scenario of 0.2% per annum growth based on the '*national DEFRA central forecast'.* However, the source of this annual growth rate is not quoted and it must be assumed that it was drawn from the 2014 Hertfordshire Report, because that is the only document referenced. A brief review of the 2014 Hertfordshire Report could not find any reference to a 0.2% per annum growth for the '*national DEFRA central forecast*'.

6. The justification of the preferred forecast of 0.2% growth per annum is not based on the recent available evidence. Defra published LACW Annual Results Tables on 5th December 2017 and this data set has not been considered in the latest version of the KCC LACW Need Assessment (dated 18th December 2017). Therefore the analysis is not based on '*the best evidence*'[3].

7. The forecast are presented to the nearest tonne which is also inconsistent with the NPPG: Waste, which states the evidence should avoid *'unnecessary and spurious precision*'.

[3] NPPG, Paragraph: 028 Reference ID: 28-028-20141016

3. Collation of baseline data

3.1 Housing data and forecasts

3.1.1 To analyse the trends in waste generation per household, household numbers between 2007/08 and 2016/17 are required, along with household forecasts up to 2031 to consider future trends.

3.1.2 Table 3.1 presents the DCLG household projection data for the period 2007 to 2031 taken from Table 406 of the Household_Projections_Published_Tables spreadsheet[4] published in July 2016.

[4] https://www.gov.uk/government/statistical-data-sets/live-tables-on-household-projections

Table 3.1 DCLG household projection data for 2007 to 2031 (thousands of households)

Local Authority	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Kent	**581**	**588**	**594**	**601**	**607**	**614**	**620**	**629**	**637**	**644**	**653**	**660**	**669**	**676**	**684**	**692**	**699**	**707**	**715**	**722**	**730**	**738**	**745**	**753**	**761**
Ashford	46	46	47	47	48	49	50	50	51	52	53	54	54	55	56	57	57	58	59	60	60	61	62	62	63
Canterbury	59	59	60	60	61	61	62	63	64	65	66	67	67	68	69	70	70	71	72	73	74	74	75	76	77
Dartford	38	38	39	40	40	41	41	42	43	43	44	45	45	46	47	47	48	48	49	49	50	51	51	52	52
Dover	47	47	48	48	48	49	49	49	50	50	51	51	52	52	53	53	54	54	55	55	56	56	57	57	57
Gravesham	39	40	40	40	40	41	41	42	43	43	44	44	45	45	46	46	47	47	48	48	49	49	50	50	51
Maidstone	60	61	62	63	64	64	65	66	67	68	69	70	71	72	73	74	75	76	76	77	78	79	80	81	81
Sevenoaks	46	46	46	47	47	48	48	48	49	49	50	50	51	51	52	52	53	53	54	54	55	55	56	56	57
Shepway	45	46	46	47	48	48	48	49	49	50	50	51	52	52	53	53	54	54	55	55	56	57	57	58	58
Swale	53	54	54	55	56	57	57	58	59	60	61	61	62	63	64	65	66	66	67	68	69	69	70	71	72
Thanet	58	58	59	59	60	60	61	62	62	63	64	65	65	66	67	68	69	69	70	71	72	73	73	74	75
Tonbridge and Malling	46	47	47	48	48	49	49	50	50	51	52	52	53	54	54	55	55	56	57	57	58	58	59	60	60
Tunbridge Wells	45	45	46	47	47	48	48	48	49	49	50	50	51	51	52	52	53	53	54	54	55	55	56	56	57
Medway UA	**103**	**104**	**105**	**106**	**107**	**108**	**110**	**111**	**113**	**114**	**116**	**117**	**118**	**120**	**121**	**122**	**124**	**125**	**126**	**128**	**129**	**130**	**131**	**133**	**134**

3.2 LACW data

3.2.1 The term 'local authority collected waste', abbreviated to 'LACW' is used to refer to all waste collected by a local authority and consists of a number of elements:

- household waste - waste collected or received from households within the local authority;
- trade waste - the commercial and industrial waste collected by the local authority (e.g. from local businesses);
- other municipal wastes - for example waste from parks and gardens, or fly tipping; and
- non-municipal fractions - principally construction and demolition waste.

3.2.2 LACW is the only waste stream in the UK where the total waste generation is accurately known. This is as a result of the detailed data set collected through WasteDataFlow (WDF). WasteDataFlow is a web-based system for quarterly reporting on LACW data by local authorities to central government.

3.2.3 Defra collates the data by local authority within WDF on an annual basis and publishes a series of data tables presenting a range of information on LACW and associated performance indicators. The most recent LACW data set was published on 5th December 2017[5] in an Excel spreadsheet (LA_and_Regional_Spreadsheet_201617) which includes:

- Table 1: Local Authority collected and household waste statistics 2014/15 to 2016/17 by local authority;
- Table 1a: Regional breakdown - LACW generation from 2000/01 to 2016/17;
- Table 2: Management of LACW, 2014/15 to 2016/17 by local authority;
- Table 2a: Regional breakdown: Management of LACW, 2016/17;
- Table 3: Selected waste indicators 2010/11 to 2016/17 by local authority;
- Table 3a: Regional - Selected waste indicators 2000/01 to 2016/17;
- Table 3b: Overall recycling Rates 2000/01 to 2016/17, England.

3.2.4 Data has been extracted from 'Table 1' of the most recent data release, along with comparable data from earlier statistical releases, to provide a breakdown of the LACW produced in Kent between 2007/08 and 2016/17. These are shown in Table 3.2 of this report and Figure 3.1.

3.2.5 Table 3.3 presents the tonnages of the headline categories of LACW for the South East Region and England, with Figure 3.2 providing a comparison of the total LACW in the South East Region and England with Kent's LACW arisings.

[5] https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables

Table 3.2 LACW produced in Kent 2007/08 to 2016/17 (tonnes)

Elements of LACW	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Household dry recycling/reuse				173,819	169,825	162,190	169,005	173,656	172,373	182,045
Household green recycling/reuse				95,665	105,342	105,482	119,661	132,056	125,617	137,446
Household, waste sent for recycling/composting/reuse	**267,308**	**273,496**	**261,944**	**269,484**	**275,167**	**267,672**	**288,665**	**305,712**	**297,991**	**319,490**
Household, regular collection (not recycled)	357,430	330,173	318,554	319,304	299,939	291,815	279,739	267,239	277,428	274,545
Household, civic amenity sites (not recycled)	79,808	66,009	58,613	57,535	53,065	46,012	45,323	50,131	54,579	54,594
Household, other sources (not recycled)	40,956	37,321	37,848	42,535	38,698	39,125	40,895	39,790	36,751	33,171
Household, estimated rejects			6,096	6,954	5,681	5,804	6,783	7,395	9,181	7,563
Household, waste not sent for recycling	***478,194***	***433,503***	**421,110**	**419,374**	**391,702**	**382,756**	**372,724**	**364,551**	**377,939**	**369,873**
Household, total waste	**745,502**	**706,999**	**683,054**	**688,857**	**666,869**	**650,428**	**661,390**	**670,263**	**675,930**	**689,363**
Non-household, waste sent for recycling/composting/reuse	46,348	41,812	45,415	38,267	40,234	31,217	32,371	33,577	33,442	36,212
Non-household, waste not sent for recycling	11,644	11,205	8,752	12,003	10,011	7,475	7,547	7,513	6,824	5,568
Non-household, total waste	***57,992***	***53,017***	**54,167**	**50,270**	**50,245**	**38,692**	**39,918**	**41,091**	**40,266**	**41,779**
LACW, sent for recycling/composting/reuse			307,359	307,751	315,401	298,889	321,036	339,289	331,433	355,702
LACW, not sent for recycling			429,862	431,377	401,713	390,231	380,271	372,065	384,763	375,441
LACW, estimated rejects			6,102	6,964	5,684	5,808	6,794	7,412	9,181	7,563
Total LACW	**803,494**	**760,016**	**743,323**	**739,127**	**717,114**	**689,120**	**701,308**	**711,354**	**716,196**	**731,143**
Number of households, DCLG (Section 3.1)	581,373	588,212	593,762	600,851	606,910	613,976	620,472	628,927	636,511	644,489
Tonnes of household waste per household	1.282	1.202	1.150	1.146	1.099	1.059	1.066	1.066	1.062	1.070
Tonnes of LACW per household	1.382	1.292	1.252	1.230	1.182	1.122	1.130	1.131	1.125	1.134
Tonnes of non-household LACW per household	0.100	0.090	0.102	0.084	0.083	0.063	0.064	0.065	0.063	0.065

Notes: Source: Department for Environment, Food & Rural Affairs

There have be some minor changes to the data set reported with increase granularity since 2010/11 and the presentation of the estimated rejects

Not reported	
Not reported but calculated for reported figures	*Value*
Not additive as included in not sent for recycling	

Figure 3.1 LACW produced in Kent 2007/08 to 2016/17 and household waste per household

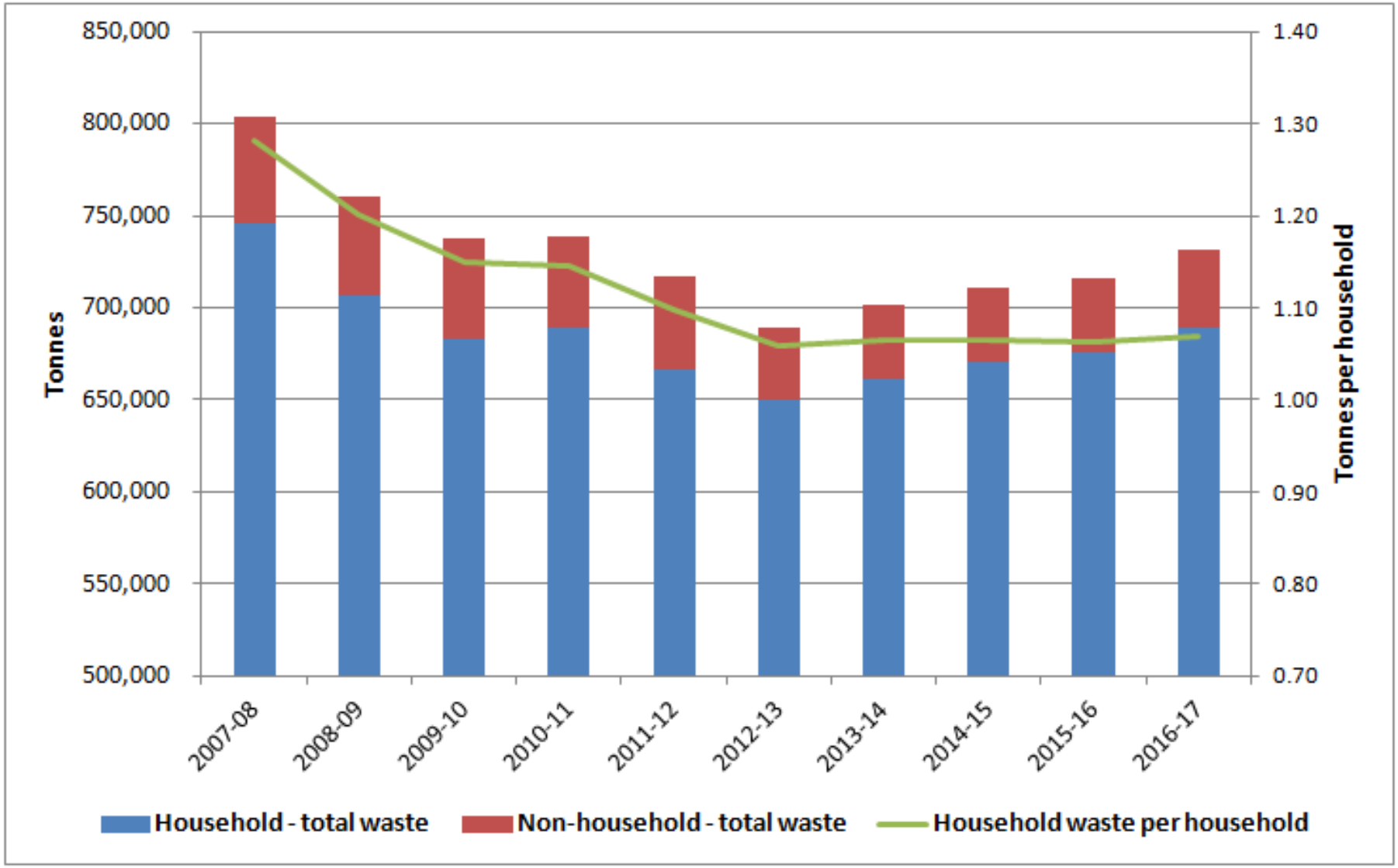


Table 3.3 LACW produced in the South East Region and England 2007/08 to 2016/17 (thousand tonnes)

South East Region										
Household waste from:	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**
Regular household collection	1,992	1,871	1,800	1,742	1,673	1,630	1,641	1,628	1,638	1,616
Other household sources	167	172	182	186	184	193	200	174	183	177
Civic amenity sites	555	444	379	373	326	326	365	376	400	372
Household recycling	1,528	1,551	1,576	1,619	1,669	1,649	1,712	1,787	1,782	1,858
Total household	**4,242**	**4,038**	**3,937**	**3,920**	**3,852**	**3,797**	**3,920**	**3,966**	**4,002**	**4,024**
Non household sources (excl. recycling)	171	149	152	158	129	117	123	122	114	117
Non household recycling	149	142	141	152	165	151	181	189	182	164
Total LACW	**4,563**	**4,328**	**4,230**	**4,230**	**4,146**	**4,066**	**4,224**	**4,278**	**4,298**	**4,304**
England										
Household waste from:	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**
Regular household collection	13,046	12,076	11,432	11,048	10,586	10,317	10,308	10,392	10,532	10,497
Other household sources	1,073	1,026	1,070	1,047	997	1,027	1,099	1,058	1,142	1,099
Civic amenity sites	2,434	2,086	1,765	1,635	1,470	1,477	1,568	1,597	1,700	1,728
Household recycling	8,735	9,146	9,398	9,724	9,846	9,759	9,980	10,117	10,075	10,329
Total household	**25,287**	**24,334**	**23,666**	**23,454**	**22,899**	**22,580**	**22,967**	**23,169**	**23,449**	**23,653**
Non household sources (excl. recycling)	2,250	2,063	1,999	1,882	1,654	1,558	1,600	1,617	1,585	1,634
Non household recycling	969	936	877	864	866	817	950	950	998	923
Total LACW	**28,506**	**27,334**	**26,541**	**26,200**	**25,419**	**24,955**	**25,518**	**25,737**	**26,032**	**26,210**

Figure 3.2 Comparison of South East Region and England LACW arisings with Kent's LACW arisings 2007/08 to 2016/17

3.2.6 Table 3.4 provides a summary of the management method used to handle the LACW generated in Kent.

Table 3.4: Management Methods for LACW generated in Kent (tonnes) 2007/08 to 2016/17

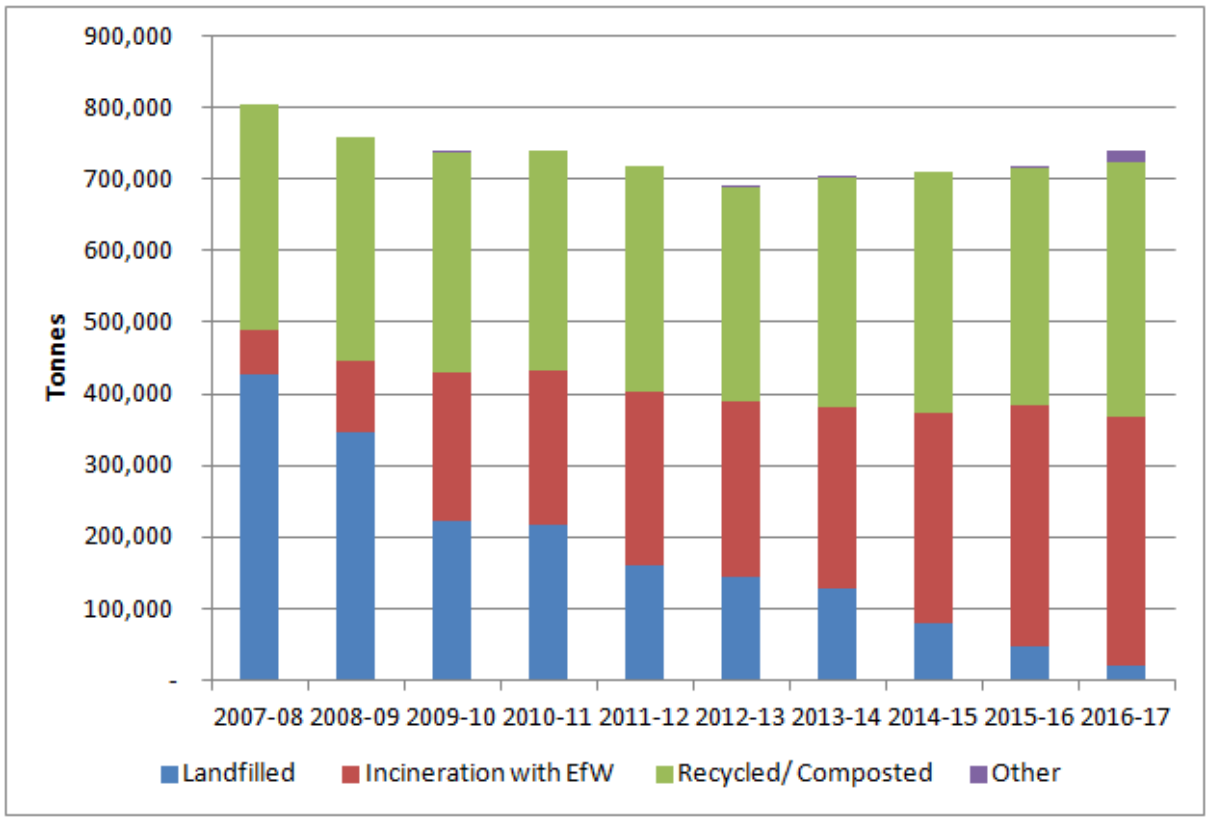
Management Method	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Landfilled	427,584	346,057	222,021	215,437	161,249	145,072	127,426	78,738	46,197	20,770
Incineration with EfW	62,253	98,651	207,842	215,940	240,464	245,157	252,853	293,331	338,068	348,179
Recycled/Composted	313,656	315,308	307,359	307,751	315,401	298,889	321,036	339,289	331,433	355,702
Other[1]	-	-	0	-	-	3	8	-	1,665	16,083
Total[2]	**803,494**	**760,016**	**737,221**	**739,127**	**717,114**	**689,120**	**701,324**	**711,358**	**717,363**	**740,733**
Input to intermediate plants[3]							-	-	2,191	32,338

Notes: Source: Department for Environment, Food & Rural Affairs
There have be some minor changes to the data set reported with increase granularity since 2014/15

1. Other includes waste treated/disposed through other unspecified treatment processes as well as process and moisture loss.
2. Total Local Authority collected waste managed may not match total Local Authority collected waste collected due to stockpiling of waste between reporting periods.
3. Refers to input to MBT, Residual MRF, RDF and other plants prior to treatment and disposal.

3.2.7 Figure 3.3 present the LACW management method graphically and highlights the decrease in the proportion of LACW landfilled over the last 10 years mirrored by the increase in the proportion of LACW incinerated.

Figure 3.3 Management Methods for LACW generated in Kent (tonnes) 2007/08 to 2016/17



3.2.8 Table 3.5 shows the key national performance indicators for Kent between 2010/11 and 2016/17 (as reported in Defra's LA_and_Regional_Spreadsheet_201617, Table 3) with the data presented graphically in Figures 3.4 to 3.7.

Table 3.5 Key national performance indicators for Kent 2010/11 to 2016/17

Year	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Residual household waste per household (kg/household) (Ex NI191)	665	616	599	580	567	585	567
Percentage of household waste sent for reuse, recycling or composting (Ex NI192)	39.0%	41.1%	41.0%	43.6%	45.6%	44.1%	46.3%
Percentage of municipal (LACW) waste sent to landfill (Ex NI193)	29.1%	22.5%	21.0%	18.2%	11.1%	6.5%	2.8%
Collected household waste per person (kg) (Ex BVPI 84a)	490	465	441	446	450	443	447

Figure 3.4 Kent Residual household waste per household (kg/household) (Ex NI191) 2010/11 to 2016/17

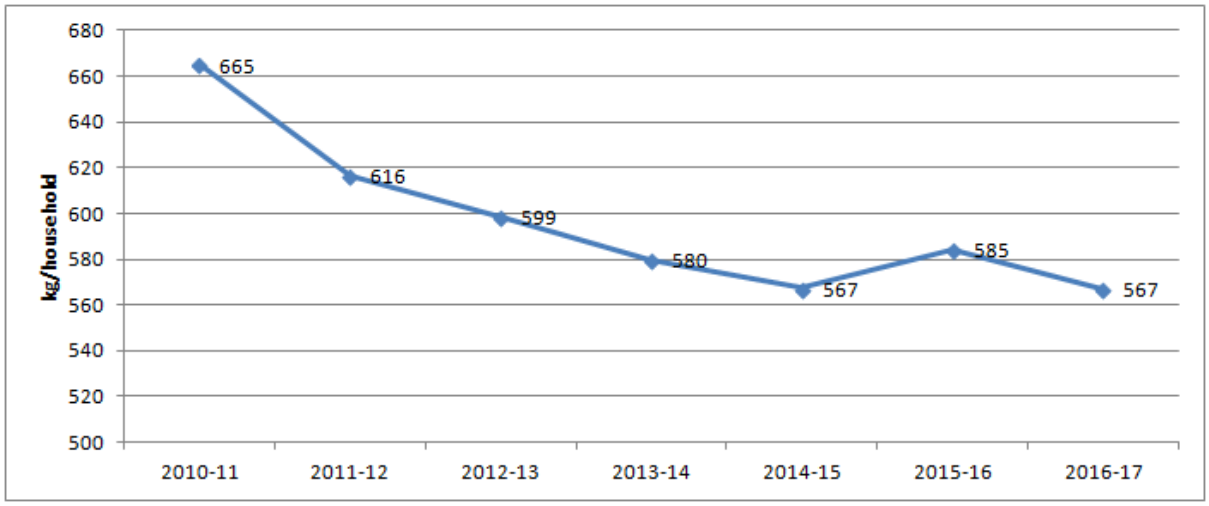


Figure 3.5 Kent Percentage of household waste sent for reuse, recycling or composting (Ex NI192) 2010/11 to 2016/17

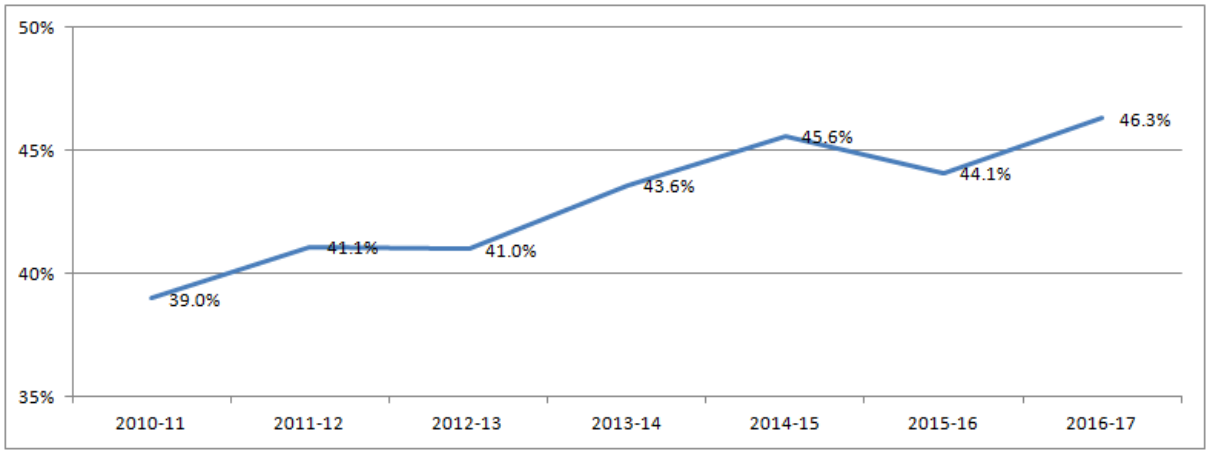


Figure 3.6 Kent Percentage of LACW sent to landfill (Ex NI193) 2010/11 to 2016/17

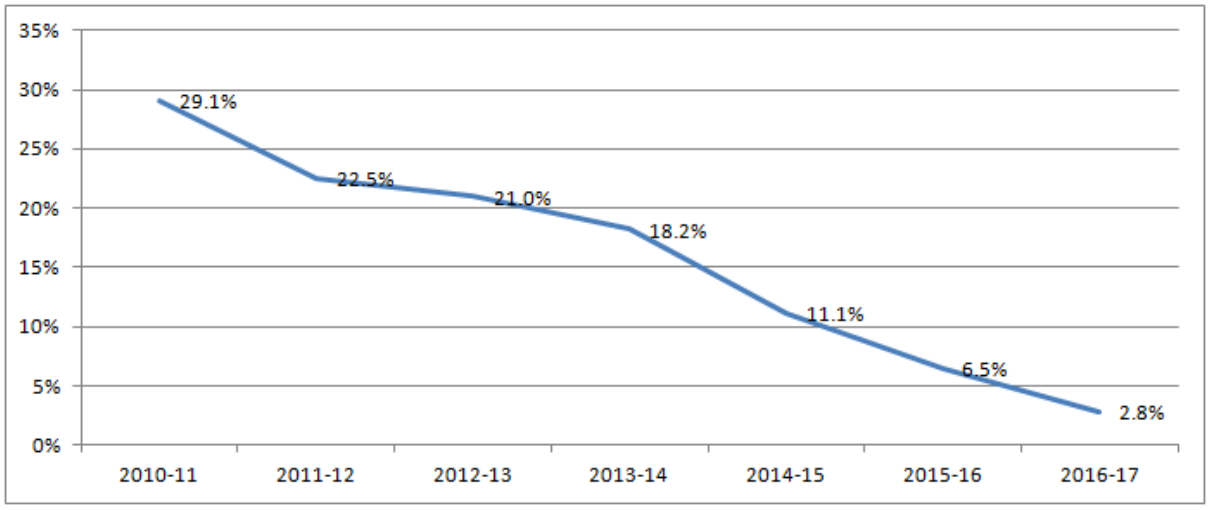
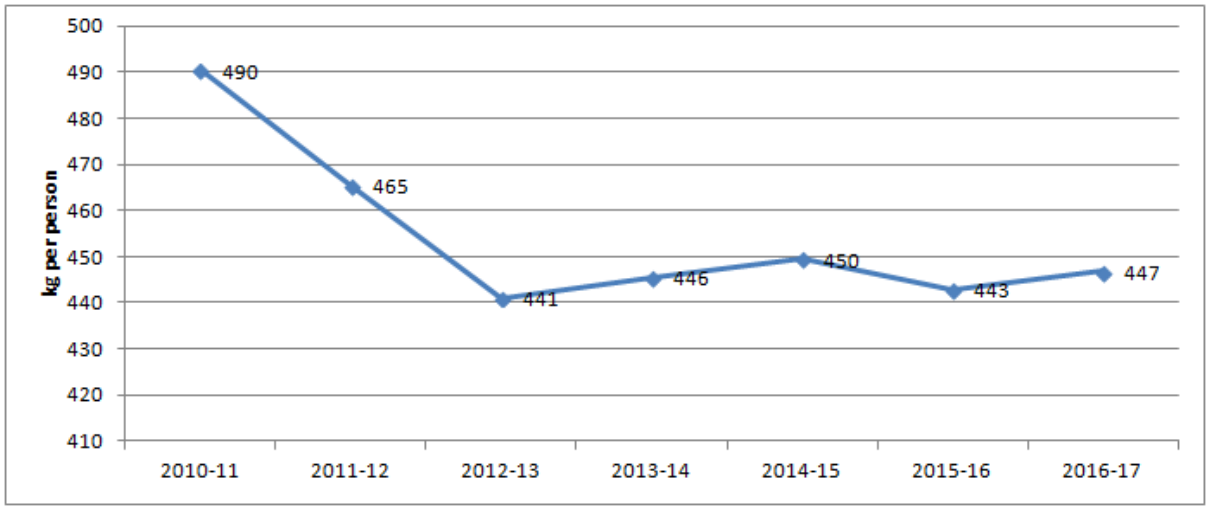


Figure 3.7 Kent Collected household waste kg per person (Ex BVPI 84a) 2010/11 to 2016/17



3.3 Economic growth and waste generation

3.3.1 Historical trends in most industrial economies show that resource use and the resulting waste generation is linked to economic activity. Decoupling economic growth from waste generation is the main objective of recent waste policies (e.g. waste prevention, resource efficiency, circular economy) across Europe. Consequently, there have been a number of studies over the last few years that look at the relationship between waste growth and economic growth.

3.3.2 At the end of 2012, WRAP published a report[6] highlighting that household waste arisings peaked between 2003 and 2007 and started to fall before the start of the recession, showing strong evidence of decoupling. For England, there was strong evidence of decoupling of household waste arisings from Gross Disposable Household Income[7] and a short period of decoupling with Gross Value Added[8]. However, from 2005/06 waste rose and fell in line with Household Expenditure[9], suggesting a strong link, or coupling, between Household Expenditure and household waste arisings, as would be expected.

3.3.3 It also highlighted that the perception of the 2007 credit crunch precipitated a loss of consumer confidence, with Household Expenditure falling while income was yet unaffected, and that household waste arisings are not coupled to Gross Disposable Household Income at a time of low consumer confidence (although they may well be at other more positive times).

3.3.4 More recent modelling[10] undertaken but the National Infrastructure Commission (NIC) to inform the National Infrastructure Assessment, highlighted that historical data shows that

[6] WRAP, Decoupling of Waste and Economic Indicators, October 2012

[7] Gross Disposable Household Income (GDHI) – an alternative measure of income; it measures what is available for households to spend or save once taxes, social contributions, pension contributions and property ownership have been taken into account.

[8] Gross Value Added (GVA) measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom and is a headline measure used to monitor economic performance.

[9] Household Expenditure (HE) encompasses all domestic outlays (by residents and non-residents) for individual needs, including expenditure on goods and services.

[10] Infrastructure Commission (NIC) Modelling Results Roundtable, London, June 2017

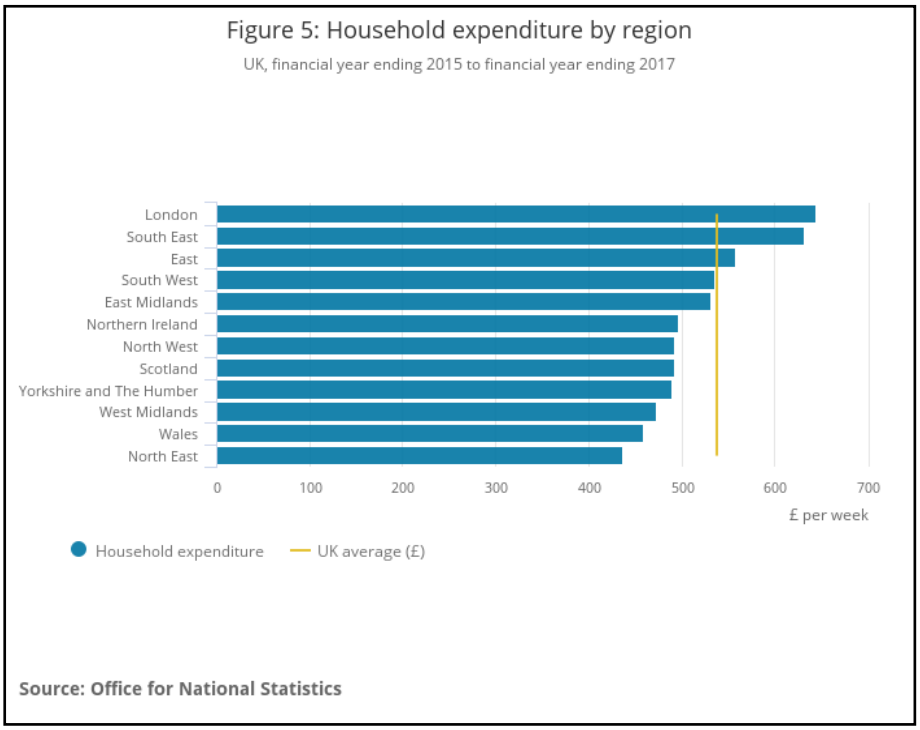
waste generation is correlated with economic activity. However, recent trends indicate that economic growth and LACW arisings may be decoupling (i.e. using less resources and generating less waste per unit of economic activity). Due to the uncertainty around the rate at which waste arisings may decouple from economic growth in the future, a sensitivity analysis of the degree of decupling was factored into this modelling of future LACW arisings.

3.3.5 The NIC modelling of future LACW arisings suggested LACW arisings of between 31 million tonnes and 59 million tonnes by 2050; with the exception of the model which assumed a high decoupling rate, which indicated a reduction to 23 million tonnes compared with a 2015 arising of 26 million tonnes.

3.3.6 Therefore, when forecasting future LACW arisings, there is a need to recognise a degree of decoupling of waste growth from economic growth (GVA) but there is still correlation of house expenditure with LACW growth.

3.3.7 The ONS Statistical Bulletin 'Family spending in the UK: financial year ending 2017'[11] highlights that the average weekly household spending rose to £554.20 in the financial year ending 2017; in real terms this was a return to pre-economic downturn levels. In addition, the Bulletin highlights that London and the South East have the highest average weekly household spending, as shown in Figure 3.8, which reproduces Figure 5 from the Bulletin.

Figure 3.8 Household expenditure by region from ONS Statistical Bulletin 'Family spending in the UK: financial year ending 2017'



[11] https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/bulletins/familyspendingintheuk/financialyearending2017

3.3.8 Figure 3.9 provides a comparison of Kent's LACW arisings with UK Total average household expenditure per week.

Figure 3.9 Comparison of UK Total average household expenditure per week with Kent's LACW arisings 2007/08 to 2016/17

Economic Growth in Kent

3.3.9 Kent Economic Indicators 2017[12], provides GVA figures for Kent between 2012 and 2017; these are the headline measure used to monitor economic performance.

3.3.10 The GVA figures are reproduced in Table 3.6, along with the year-on-year percentage change in GVA. The data shows a year-on-year increase in GVA, indicating the growth in the local economy.

Table 3.6 GVA per Head, Kent 2012 to 2017

	2012	2013	2014	2015	2016	2017
GVA per Head (£)	19,293	19,494	19,869	20,355	21,056	21,636
% change in GVA		1.0%	1.9%	2.4%	3.4%	2.8%
Source: Kent Economic Indicators 2017, Strategic Business Development & Intelligence, Kent County Council www.kent.gov.uk/research						

[12] Strategic Business Development & Intelligence, Kent County Council www.kent.gov.uk/research

3.3.11 GVA forecasts are not generally publically available and have to be purchased on a commercial basis. However, the Kent County Council, Growth and Infrastructure Framework highlights some GVA growth estimates up to 2031 for:

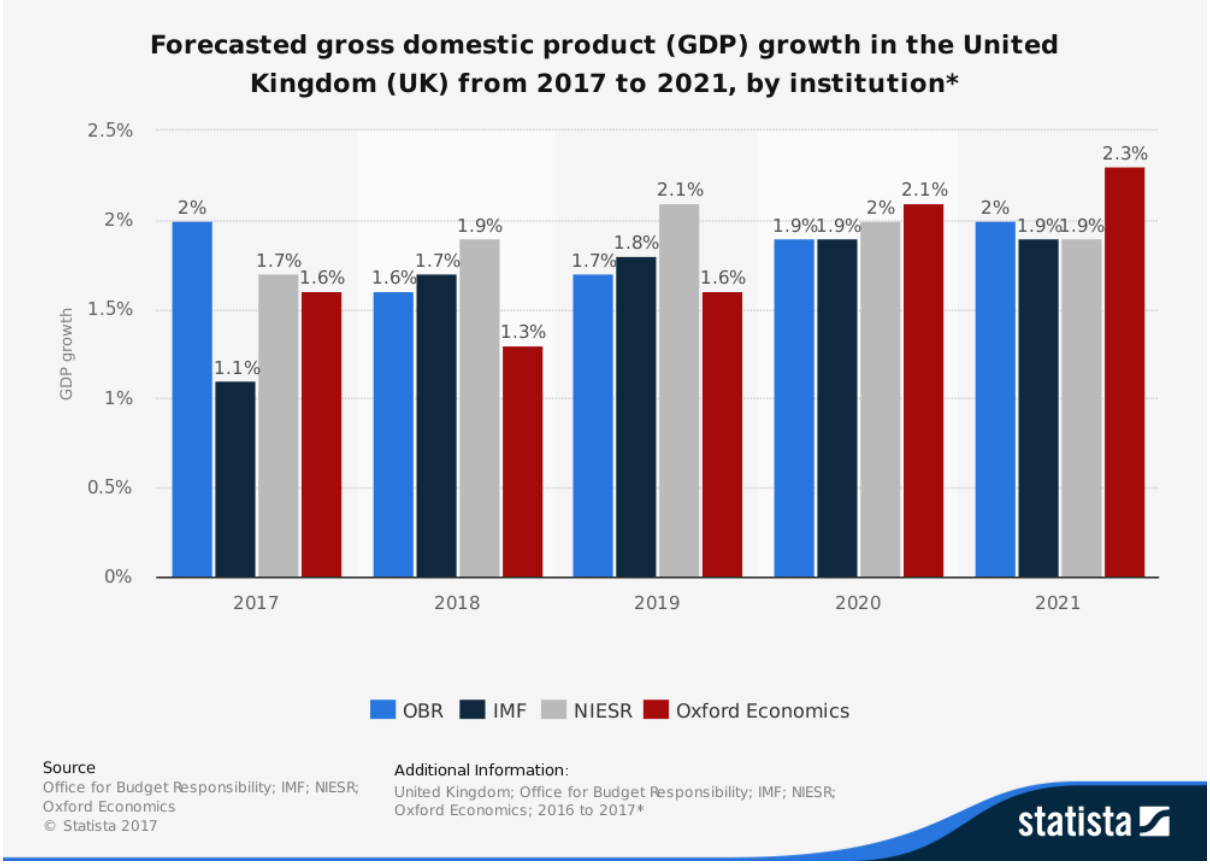
- Ashford BC: 91% by 2031
- Dartford BC: 99% by 2031
- Dover DC: 34% by 2031
- Thanet DC: 51% by 2031

3.3.12 This level of growth is equivalent to average annual growth in GVA of between 1.5% and 4%, which would suggest continuing growth in LACW arisings even with a level of decoupling between economic growth and waste growth.

3.3.13 In addition, short term growth in gross domestic product (GDP)[13] suggests continuing growth in the UK economy.

3.3.14 Figure 3.10, compiled by Statista, show a comparison of GDP growth forecasts in the UK from 2017 to 2021, all of which show GDP growth.

Figure 3.10 UK GDP forecasts 2017 to 2021



Source: https://www.statista.com/statistics/375195/gdp-growth-forecast-comparison-uk/

[13] GDP is a key indicator of the state of the whole economy.
GVA + taxes on products - subsidies on products = GDP

4. Review of local authority systems and performance

4.1 Waste collection services

4.1.1 To understand future waste treatment requirements, in particular the phasing for different waste treatment capacity, it is important to understand the current waste collection schemes and the materials collected.

Dry Recycling Schemes

4.1.2 All the Waste Collection Authorities (WCA) offer kerbside collection services for dry recyclables to the majority of households in their area, with some properties offered communal recycling collections. The predominant collection scheme in each WCA area is summarised in Table 4.1.

Table 4.1 Predominant collection schemes offered by Kent WCA, 2016/17

WCA	Scheme type	Dry Recycling Collection Frequency	Residual Collection Frequency	Materials											
				Glass	Cans	Aerosols	Foil	Card	Plastic Bottles	Mixed plastics	Paper	Batteries	Textiles	Other	Composites
Ashford BC	Co-Mingled	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Canterbury CC	Two Stream	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Dartford BC	Two Stream	F'nightly	Weekly	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Dover DC	Two Stream	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Gravesham BC	Co-Mingled	F'nightly	Weekly	X	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Maidstone BC	Co-Mingled	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓
Sevenoaks DC	Co-Mingled	Weekly	Weekly	X	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Shepway DC	Two Stream	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓
Swale BC	Co-Mingled	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Thanet DC	Two Stream	F'nightly	F'nightly	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
Tonbridge and Malling BC	Multi-Stream	F'nightly	Weekly	X	✓	✓	✓	X	X	X	✓	X	X	X	✓
Tunbridge Wells BC	Multi-Stream	F'nightly	F'nightly	X	✓	X	X	✓	✓	✓	✓	X	X	X	✓

Source: WRAP's Local Authority Waste and Recycling Portal

Garden Waste Schemes

4.1.3 All the WCA in Kent offer fortnightly subscription based garden waste collection services, with the exception of Tonbridge and Malling BC and Tunbridge Wells BC who offer a fortnight service for mixed food and garden waste, free of charge.

Separate Food Waste Schemes

4.1.4 8 of the 12 WCA offer separate weekly food waste collections, they are: Ashford BC; Canterbury CC; Dover DC; Gravesham BC; Maidstone BC; Shepway DC; Swale BC; and Thanet DC.

4.1.5 As highlighted in Section 4.1.3, Tonbridge and Malling BC and Tunbridge Wells BC both offer mixed food and garden waste collection.

4.1.6 Dartford BC and Sevenoaks DC do not offer food waste collections.

4.2 Recycling Performance

4.2.1 WRAP's Local Authority Waste and Recycling Portal (the WRAP Portal) holds benchmarking information that provides performance data showing how local authority kerbside dry recycling and residual waste schemes are performing, both in the UK and against comparable local authorities.

4.2.2 The current data in the WRAP Portal is for the year 2015/16, presenting the kerbside dry recycling yield (kg/household/year) for each of the main materials collected (paper, card, cans, glass, plastic bottles, mixed plastic packaging and textiles) and a total yield for all five widely recycled materials, where they are collected. The yield for each material is also compared against benchmarks to show in which quartile it resides. The benchmarks used to compare the yields are:

- the UK as a whole;
- the local authority region;
- the Office for National Statistics (ONS) area group, which assigns authorities into groups which have key population characteristics in common such as housing type and age distribution; and
- the Urban-Rural Index of Multiple Deprivation (IMD) classification, is a 6-part classification combining rural nature and deprivation level.

4.2.3 The data for the Kent WCA has been extracted for 2015/16 and is presented in Table 4.2; it is also benchmarked against the ONS area group each WCA sits within. Table 4.2 also contains the 2016/17 percentage recycling and composting rate, to show the change between 2015/16 and the most recent data which is yet to be added to the WRAP Portal.

.

Table 4.2 Benchmarking of Kent WCA, 2015/16

Kent WCAs	ONS Area classification	Yield (kg/hhd/yr)									% of household waste sent for recycling and composting	
		Kerbside recycling collections							All 5 'Widely Recycled' materials	Kerbside Residual Waste		
		Paper	Card	Cans	Glass	Plastic bottles	Mixed plastic packaging	Textiles			2015/16	2016/17
Ashford BC	Country Living	100.9	37.4	12.2	63.5	16.6	6.5	n/a	230.6	330.4	53.1%	55.0%
Canterbury CC	Larger Towns and Cities	45.8	21.5	12.5	70.8	16.9	6.5	n/a	167.5	387.9	43.2%	44.4%
Dartford BC	Suburban Traits	88	30.7	9.4	30.1	13.5	5.3	n/a	171.7	580.2	26.5%	25.2%
Dover DC	Remoter Coastal Living	58.6	27.6	12.4	70.3	16.7	6.4	n/a	185.7	350.2	41.7%	44.7%
Gravesham BC	Suburban Traits	80.9	28.2	8.6	n/a	12.4	4.9	n/a	n/a	432.4	35.0%	34.5%
Maidstone BC	Thriving Rural	101.8	37.7	12.4	64	16.8	6.6	n/a	232.7	372.3	47.8%	49.9%
Sevenoaks DC	Thriving Rural	81.3	28.4	8.7	n/a	12.5	4.9	n/a	n/a	509.6	31.9%	38.3%
Shepway DC	Remoter Coastal Living	50.8	23.9	13.7	78	18.6	7.1	n/a	185	381.5	44.0%	42.5%
Swale BC	Country Living	86.3	31.9	10.5	50.5	14.2	5.2	0.1	193.4	466.1	36.9%	41.6%
Thanet DC	Remoter Coastal Living	49.6	23.3	8	45.4	10.8	4.1	n/a	137.1	396.7	31.6%	33.8%
Tonbridge and Malling BC	Thriving Rural	47.9	n/a	5.5	n/a	n/a	n/a	n/a	n/a	484.8	41.5%	42.5%
Tunbridge Wells BC	Thriving Rural	72.9	34.3	8.3	n/a	12.1	4.8	n/a	n/a	433	45.6%	49.1%
Kent CC		n/a									44.1%	46.3%

Key: Quartile compared to other authorities in their ONS Area classification

In bottom 25% of LAs | In bottom 50% of LAs | In top 50% of LAs | In top 25% of LAs

It should be note that for Kerbside Residual Waste, the smaller the yield the better the performance

4.2.4 Key points to note from this data are:

- There is a range in the performance across the WCA: half of the 12 WCA being above the national recycling rate of 43% in 2015/16; and 5 being above the national recycling rate of 43.7% in 2016/17.
- 7 of the 12 WCA are in the top 50% of local authorities in their ONS Area classification for residual waste yield.
- 4 of the 12 WCA do not collect all 5 'Widely Recycled' materials. Whilst this is reflected in the % of household waste sent for recycling and composting for Gravesham BC and Sevenoaks DC, Tonbridge and Malling BC and Tunbridge Wells BC have recycling rates over 40%. This is because these WCA offer a fortnightly service for mixed food and garden waste, free of charge, which results in a significant quantity of material being sent for composting, compared to the other WCA, which only offer a fortnightly subscription based garden waste collection service.

4.2.5 In addition Figures 4.1 to 4.3 show the key national performance indicators for the Kent WCA between 2010/11 and 2016/17 (as reported in Defra's LA_and_Regional_Spreadsheet_201617, Table 3). With the exception of Ashford BC, there has been little significant change in these indicators over the last 5 years.

Figure 4.1 Kent Residual household waste per household (kg/household) (Ex NI191) 2010/11 to 2016/17

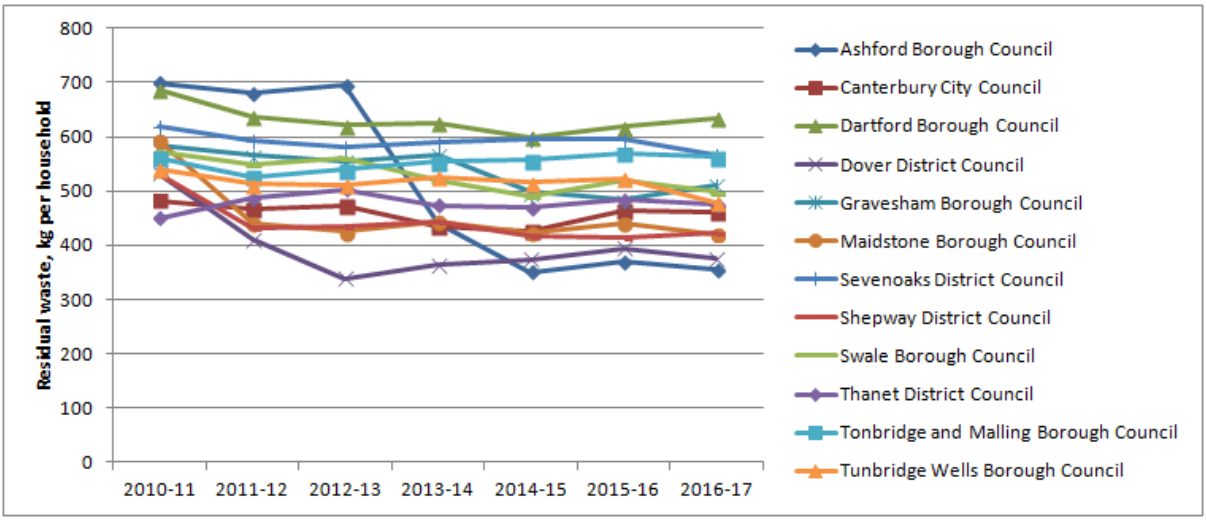


Figure 4.2 Kent Percentage of household waste sent for reuse, recycling or composting (Ex NI192) 2010/11 to 2016/17

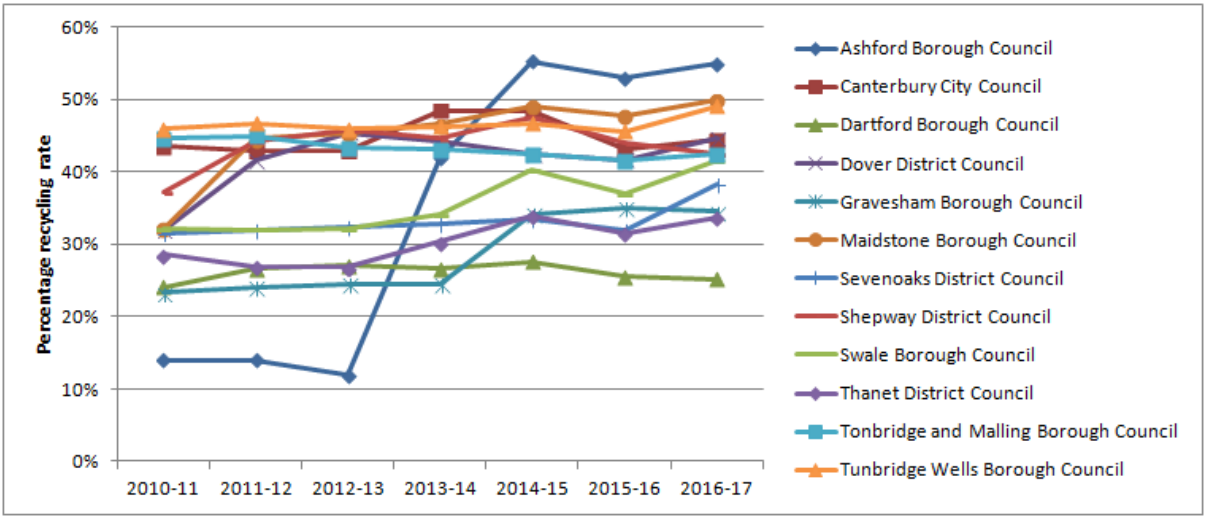
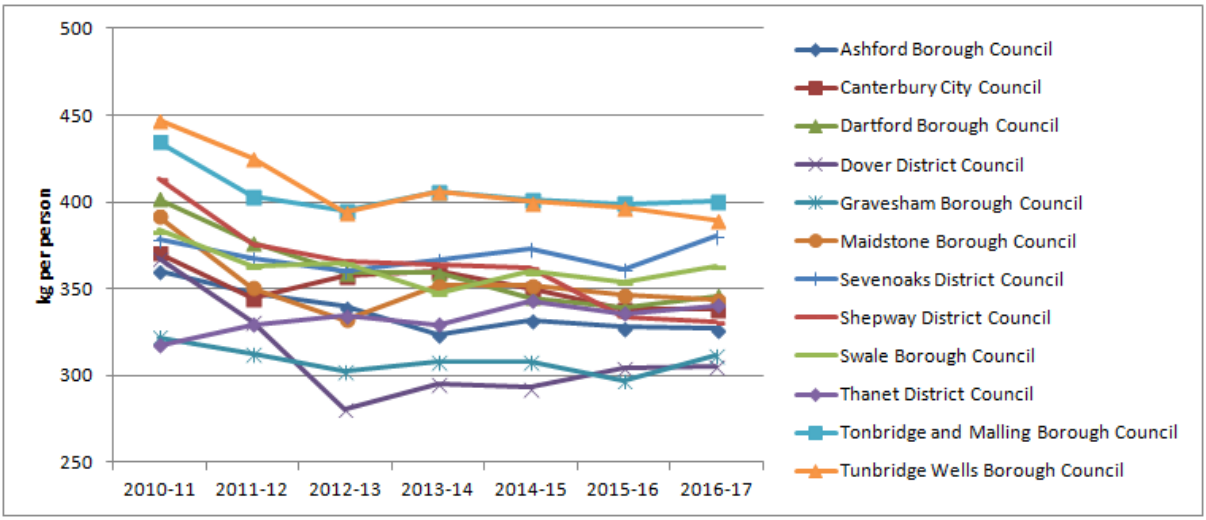


Figure 4.3 Kent Collected household waste kg per person (Ex BVPI 84a) 2010/11 to 2016/17



4.3 Impact of WCA services and performance

4.3.1 The data suggests that, without changes to collection services, the overall level of recycling and composting in Kent over the next 2 to 5 years is unlikely to exceed 50%.

4.3.2 Longer term (5 to 15 years) the level of change in performance is likely to be influenced by future government policy. However, authorities under the ONS Area classification 'Suburban Traits' (Dartford BC and Gravesham BC) are likely to struggle to significantly increase their recycling performance without notable investment and behavioural change. This could result in the overall recycling and composting rate remaining slightly above the national average, as at present.

4.3.3 Therefore assuming ambitious recycling and composting performance of greater than 60% by 2030/31 is likely to result in an oversupply of recycling and composting capacity and the potential for an undersupply of residual waste treatment capacity.

5. Waste growth scenarios and LACW forecast

5.1 Principal elements of waste growth scenarios

5.1.1 The guidance on forecasting LACW described in Section 2 highlights the three principal elements that should be considered when developing waste growth[14] profiles i.e.:

- analyse the trends in waste generation per capita or per household;
- the analysis should consider different elements of the waste stream;
- develop a range of growth profiles considering projected changes in household /population and economic growth.

5.2 Trends in waste generation per household

5.2.1 Normal practice is to look at trends over a 5 year period if the data is available and reliable; this gives a period of 2012/13 to 2016/17 over which to consider trends in waste generation per capita or per household.

5.2.2 This coincides with the low point in LACW arisings both in Kent and nationally following the impact of the recession on waste generation levels. This is consistent with the impact of the recession on waste arising set out in Table 8 of the KCC LACW Need Assessment, which indicates the effect of recession as a '*reduction overall although some increase in DIY waste*' with the impact on the baseline as a '*one-off and bounce back*'.

5.2.3 Table 5.1 provides analysis of the trend in the tonnes of household waste generated per household between 2012/13 and 2016/17.

Table 5.1 Trends in household waste generated per household in Kent, 2012/13 to 2016/17

	2012/13	2013/14	2014/15	2015/16	2016/17
Household waste per household (tonnes per household)	1.059	1.066	1.066	1.062	1.070
Year-on-year percentage change in household waste per household		0.62%	-0.02%	-0.36%	0.72%
Annual average percentage change since 2014/15			0.18%		
Annual average percentage change since 2012/13	0.24%				

5.3 Different elements of the waste stream

5.3.1 The Defra LACW statistics do not allow the trends in different elements of the household waste stream (e.g. kerbside collection, HWRC, etc) to be analysed separately because the tonnage sent for recycling/composting/reuse covers the material from all household waste stream.

5.3.2 However the data does allow an assessment of the non-household element of the LACW stream. The data for Kent, for years 2012/13 to 2016/17 is summarised in Table 5.2.

[14] 'growth' should be taken to refer equally to increase, decline, or stasis in waste arisings

Table 5.2 Non-household LACW collected in Kent, 2012/13 to 2016/17

	2012/13	2013/14	2014/15	2015/16	2016/17
Non-household LACW (tonnes)	38,692	39,918	41,091	40,266	41,779
Non-household LACW collected per household (tonnes per household)	0.063	0.064	0.065	0.063	0.065

5.3.3 The figures show that the total tonnage of non-household LACW has been relatively constant around 39,000 and 42,000 tonnes per annum. They also show that the non-household LACW collected per household has been constant at 0.064 tonne per household. However, this is not a particularly good measure for non-household LACW as there are a number of factors which affect the quantities of non-household waste collected by local authorities. These include:

- 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 (SME) 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, such as packaging e.g. light-weighting of packaging; and
- private sector waste collection companies seeking to maintain market share of commercial waste collections.

5.3.4 Due to the number of variables in the above factors, it is difficult to forecast any significant increase or decrease in the quantity of non-household waste collected by local authorities. It has therefore it is often assumed that the tonnage of non-household waste will remain constant within different growth scenarios.

5.4 Growth profiles

5.4.1 Based on this assessment of the trends in Kent, Table 5.3 presents the series of waste growth scenarios used within this Review to provide an estimate of future household waste, along with assumptions about the non-household waste fraction:

- Scenarios 1a and 1b represent waste stabilisation/waste reduction scenarios, with Scenario 1a representing static growth in waste per household up to 2031 and Scenario 1b assuming a degree of waste reduction (0.2% per annum) approximately equivalent to the increase in waste over the last 3-5 years.
- Scenarios 2a and 2b represent average growth scenarios using of the average growth seen over the last 3 and 5 years.
- Scenario 3 represents high growth based on the level of growth between 2015/16 and 2016/17.

Table 5.3 LACW growth scenarios

Scenario	Waste per household assumptions	Non-household assumptions
1a	Static household waste per household based on the average of annual arisings over the last five years, of 1.065 tonnes/household.	Non-households remains static at 2016/17 level of 41,750 tonnes per annum.
1b	Static household waste per household based on the average of annual arisings over the last five years, of 1.065 tonnes/household up to 2020/21; followed by a reduction of 0.2% per annum in waste/household up to 2031.	Non-households remains static at 2016/17 level of 41,750 tonnes per annum.
2a	The household waste per household grows, from the 2017/18 figure of 1.070 tonnes/household, at 0.18% per annum based on the annual average change since 2014/15	Non-households remains static at 2016/17 level of 41,750 tonnes per annum.
2b	The household waste per household grows, from the 2016/17 figure of 1.070 tonnes/household, at 0.24% per annum based on the annual average change since 2012/13	Non-households remains static at 2016/17 level of 41,750 tonnes per annum.
3	The household waste per household grows, from the 2016/17 figure of 1.070 tonnes/household, at 0.72% per annum based on the change over between 2015/16 and 2016/17	Non-households remains static at 2016/17 level of 41,750 tonnes per annum.

5.5 LACW forecast

5.5.1 The resulting LACW forecasts based on the growth scenarios set out in Table 5.3 are presented in Table 5.4 and Figure 5.1. Figure 5.1 includes historic LACW arisings back to 2007/08, not least to highlight the impact of the recession on LACW and to show the predicted forecasts in context with previous years.

5.5.2 This forecast indicates **a variance of between +88,000 to +193,000 tonnes[15] of LACW arisings[16]** with the conclusions drawn in the KCC LACW Need Assessment.

5.5.3 This is because the low level of growth assumed in the KCC LACW Assessment is equivalent to the change in household waste per household, but fails to go on to factor in housing growth. The forecast in the KCC LACW Need Assessment is equivalent to a 1% per annum reduction on household waste per household up to 2030/31, which is not substantiated by the current data.

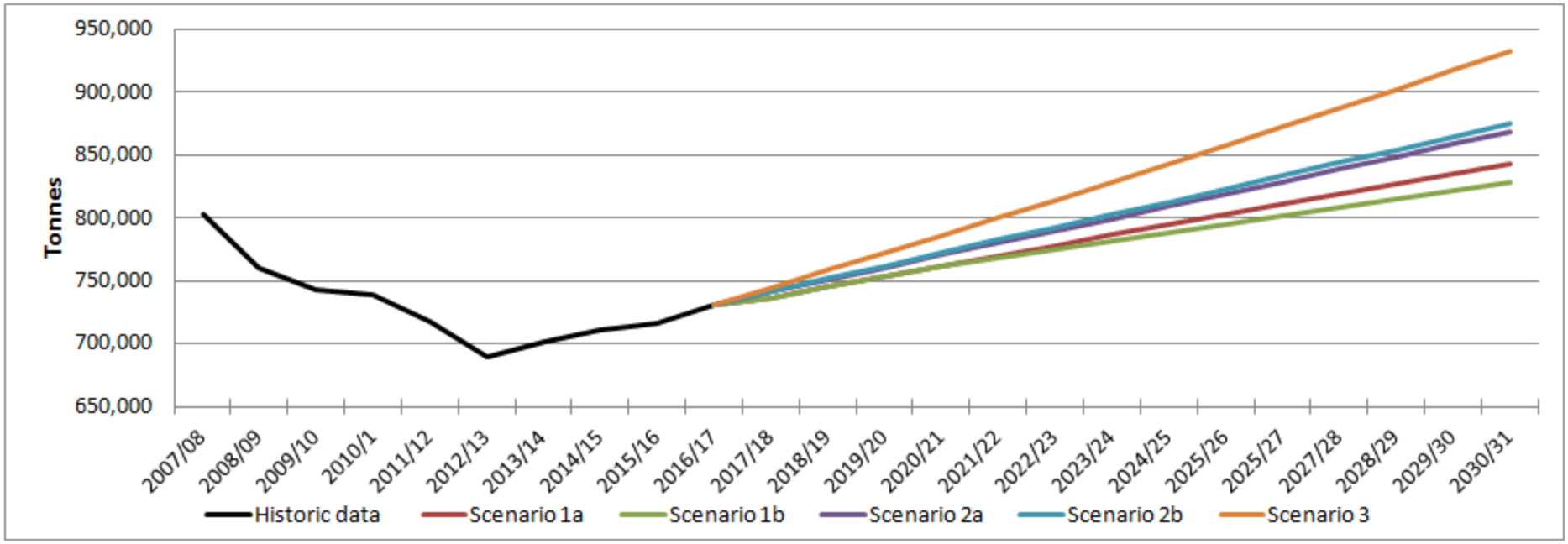
[15] Rounded to the nearest 1,000

[16] The difference between 740,000 tonnes LACW arisings at 2031 in KCC LACW Need Assessment and 827,900 tonnes at 2031 in Scenario 1b or 932,700 tonnes in Scenario 3.

Table 5.4 LACW forecast, Kent, 2017/18 to 2030/31 (rounded to nearest 100 tonnes)

Scenario	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2025/27	2027/28	2028/29	2029/30	2030/31
1a	731,143	736,700	745,200	753,700	762,000	770,200	778,400	786,600	794,800	802,900	811,200	819,400	827,600	835,700	843,800
1b	731,143	736,700	745,200	753,700	762,000	768,700	775,500	782,100	788,800	795,300	802,000	808,600	815,100	821,500	827,900
2a	731,143	741,200	751,000	761,000	770,700	780,300	790,000	799,700	809,500	819,200	829,100	839,000	848,800	858,600	868,400
2b	731,143	741,600	751,900	762,200	772,400	782,500	792,600	802,800	813,100	823,300	833,700	844,100	854,400	864,800	875,200
3	731,143	745,000	758,700	772,600	786,400	800,300	814,400	828,600	843,100	857,500	872,300	887,200	902,300	917,400	932,700

Figure 5.1 LACW forecast, Kent, 2017/18 to 2030/31 (rounded to nearest 100 tonnes)



6. Conclusions of the WTI LACW Review

6.1.1 The key conclusions drawn through this Review are that the KCC LACW Need Assessment is not based on the best evidence and does not incorporate sensitivity analysis (high or low growth).

6.1.2 To assess future capacity need, the KCC LACW Need Assessment is based on assumptions about the proportions of waste that will be handled via different waste management routes (driven by recycling/composting rates). Table 6.1 summaries the proportions used in the KCC LACW Need Assessment to estimate future capacity need in Kent (up to 2030/31) for LACW. waste.

Table 6.1 Waste management route for LACW and C&I waste as used in KCC LACW Need Assessment

LACW	**Milestone years**			
Management route	2015/16	2020/21	2025/26	2030/31
Recycling and composting	45%	50%	55%	55%
Other recovery	53%	48%	43%	43%
Landfill	2%	2%	2%	2%

6.1.3 No sensitivity analyses for either different levels of waste generation or different proportions handled via different waste management routes have been considered in the KCC LACW Need Assessment.

6.1.4 Table 6.2 summaries the sensitivities tested in this Review, which consider the different capacity needs, taking account of different proportions of waste management routes and different levels of waste generation.

6.1.5 It has been assumed that:

- the other recovery proportion is based on the level of recycling/composting achieved; and
- the proportion sent to landfill remains at 2%, as this is consistent with the currently level of 2.8% LACW being landfilled.

Table 6.2 Sensitivity analysis scenarios

Waste generation	Management route		Milestone years		
			2020/21	2025/26	2030/31
Low (Sc. 1b) Central (Sc. 2b) High (Sc. 3)	Recycling lower than Partial Review	Recycling and composting	45%	47.5%	50%
		Other recovery	53%	50.5%	48%
		Landfill	2%	2%	2%
Low (Sc. 1b) Central (Sc. 2b) High (Sc. 3)	Partial Review	Recycling and composting	45%	55%	55%
		Other recovery	48%	43%	43%
		Landfill	2%	2%	2%
Low (Sc. 1b) Central (Sc. 2b) High (Sc. 3)	Recycling higher than Partial Review	Recycling and composting	50%	55%	60%
		Other recovery	48%	43%	38%
		Landfill	2%	2%	2%

6.1.6 Table 6.3 presents the tonnages by management route and waste generation levels for the sensitivity scenarios.

Table 6.3 Sensitivity analysis results (tonnages rounded to nearest 1,000 tonnes)

Management route		Milestone years		
		2020/21	2025/26	2030/31
Recycling lower than Partial Review	Recycling and composting	45%	47.5%	50%
	Low (Sc. 1b)	343,000	378,000	414,000
	Central (Sc. 2b)	348,000	391,000	438,000
	High (Sc. 3)	354,000	407,000	466,000
	Other recovery	53%	50.5%	48%
	Low (Sc. 1b)	404,000	402,000	397,000
	Central (Sc. 2b)	409,000	416,000	420,000
	High (Sc. 3)	417,000	433,000	448,000
	Landfill	2%	2%	2%
	Low (Sc. 1b)	15,000	16,000	17,000
	Central (Sc. 2b)	15,000	16,000	18,000
	High (Sc. 3)	16,000	17,000	19,000
Partial Review	Recycling and composting	45%	55%	55%
	Low (Sc. 1b)	343,000	437,000	455,000
	Central (Sc. 2b)	348,000	453,000	481,000
	High (Sc. 3)	354,000	472,000	513,000
	Other recovery	48%	43%	43%
	Low (Sc. 1b)	366,000	342,000	356,000
	Central (Sc. 2b)	371,000	354,000	376,000
	High (Sc. 3)	377,000	369,000	401,000
	Landfill	2%	2%	2%
	Low (Sc. 1b)	15,000	16,000	17,000
	Central (Sc. 2b)	15,000	16,000	18,000
	High (Sc. 3)	16,000	17,000	19,000
Recycling higher than Partial Review	Recycling and composting	50%	55%	60%
	Low (Sc. 1b)	381,000	437,000	497,000
	Central (Sc. 2b)	386,000	453,000	525,000
	High (Sc. 3)	393,000	472,000	560,000
	Other recovery	48%	43%	38%
	Low (Sc. 1b)	366,000	342,000	315,000
	Central (Sc. 2b)	371,000	354,000	333,000
	High (Sc. 3)	377,000	369,000	354,000
	Landfill	2%	2%	2%
	Low (Sc. 1b)	15,000	16,000	17,000
	Central (Sc. 2b)	15,000	16,000	18,000
	High (Sc. 3)	16,000	17,000	19,000

6.1.7 The tonnage ranges for 'other recovery' by 2030/31, which need to be compared against the estimate of 317,968 tonnes in the KCC LACW Need Assessment are:

- Recycling lower than Partial Review management route scenario: 397,000 to 448,000 tonnes
- Partial Review management route scenario: 356,000 to 401,000 tonnes
- Recycling higher than Partial Review management route scenario: 315,000 to 354,000 tonnes

6.1.8 This sensitivity analysis indicates **a variance of up to 130,000 tonnes[17] of residual LACW** at 2030/31with the conclusions drawn in the KCC LACW Need Assessment.

6.1.9 The sensitivity analysis highlights that the estimate in the KCC LACW Need Assessment:

- is at the bottom end of the sensitivity range and would require high levels of recycling and composting and low growth in LACW, which is not substantiated by the current evidence; and
- could result in insufficient 'other recovery' capacity being assumed for the management of LACW generated in Kent.

6.1.10 It should also be noted that these estimates do not take account of the LACW produced in Medway, which has historically worked jointly with KCC on waste policy and planning.

[17] The difference between 317,968 tonnes residual LACW at 2031 in KCC LACW Need Assessment and 448,000 tonnes other recovery demand at 2031 in Recycling lower than Partial Review. Rounded to nearest 1,000.