OXFORDSHIRE MINERALS AND WASTE LOCAL PLAN

PART 1 – CORE STRATEGY

April 2016 Supplement to

WASTE NEEDS ASSESSMENT

(August 2015)

PREPARED BY BPP Consulting LLP for
Oxfordshire County Council
Submission v1.1

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1 Introduction

In January 2016 Oxfordshire County Council contracted BPP Consulting to undertake and prepare a report on a review of baseline, forecasts and targets for commercial and industrial (C&I) waste and construction, demolition and excavation (CDE) waste. This followed on from a review and update of the previous work undertaken by BPP in February 2014 that formed part of the Regulation 19 Minerals & Waste Core Strategy evidence base. In particular, BPP was asked to produce 'managed waste' baseline estimates for C&I and CDE wastes using national methodologies that have emerged since the evidence base for the Waste Needs Assessment (WNA) was originally prepared as alternatives to the 'point of production' waste arising estimates in the WNA used in the Core Strategy.

In April 2016 Oxfordshire County Council contracted BPP Consulting to undertake further work to prepare a review and update of the Oxfordshire Waste Needs Assessment, August 2015, in the form of a Supplement to it. The work presented incorporates the work commissioned in January 2016 as part of a review of the essential parts of the WNA August 2015 to ensure it is up-to-date and using the best available information. In particular, it accounts for the following developments since the WNA was issued:

- introduction of new, and clarification of existing, policy measures.
- incorporation of data from the 2014 Environment Agency Waste Data Interrogator.
- accounting for the emergence of new methodologies for estimating C&I and CDEW arisings at national level.

2 Waste Policy

A review of the waste policy section to check it is still relevant and up to date indicates the principal omission is reference to the need for waste collections to be source-separated when the following materials are present: paper, glass, metals and plastic unless separation at source is not technically, economically or environmentally justified from 1 January 2015. This is contained in *the Waste (England & Wales) Regulations 2011, as amended in 2012*. This means that there is an expectation on waste producers and collectors to separate at source thereby reducing the need for intermediate separation sites such as MRFs and promoting direct haul of bulked up materials to reprocessors in UK or aboard.

In addition, the introduction of performance standards for intermediate MRFs through the *Environmental Permitting (England and Wales) (Amendment) Regulations 2014* increases the capital investment requirement of MRFs.
This has resulted in a consolidation of MRF capacity into fewer larger more technically advanced facilities - with the closure of some within the South East (Ideal Paper in Kent and DS Smith in Hampshire).

The combination of the two measures above means that the achievement of targets for recycling should not necessarily mean that additional capacity needs to be built in the Plan Area.

The section of the WNA (paragraph 2.3) relating to Article 16 of the Waste Framework Directive could be usefully clarified as follows:

Article 16 of the Waste Framework Directive establishes the principles of self-sufficiency and proximity in the following terms:
"*Member States shall take appropriate measures, in cooperation with other Member States where this is necessary or advisable, to establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers such waste from other producers, taking into account best available techniques.*
The network shall be designed to enable the Community as a whole to become self-sufficient in waste disposal as well as in the recovery of waste referred to in paragraph 1, and to enable Member States to move towards that aim individually, taking into account geographical circumstances or the need for specialised installations for certain types of waste.
The network shall enable waste to be disposed of or waste referred to in paragraph 1 to be recovered in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health.

The principles of proximity and self-sufficiency shall not mean that each Member State has to possess the full range of final recovery facilities within that Member State."

The National Planning Policy for Waste applies the concept at a national level by stating that WPAs should:
"*plan for the disposal of waste and the recovery of mixed municipal waste in line with the proximity principle, recognising that new facilities will need to serve catchment areas large enough to secure the economic viability of the plant*."

The National Waste Management Plan for England is silent in relation to the expectation on a spatial distribution of facilities, purely focusing on the provision of infrastructure as a priority.

It is clear from the above that the expectation to follow the proximity principle, as set out in the WFD, only applies when provision is to be made for facilities involving either:

- the disposal of waste i.e. landfill or incineration without energy recovery; or
- the recovery of mixed municipal waste collected from private households.

Hence there is no legislative or national policy expectation that provision for the recovery of waste, other than mixed municipal waste (aka local authority collected waste – LACW) should be made with proximity as an overriding principle. Rather it should be a consideration within the wider issue of spatial distribution that may well extend beyond a single Plan Area boundary.

This has an important bearing on the WNA since OCC has already provided recovery capacity for LACW within the Plan Area. Movements outside the Plan Area of wastes going for management are neither prohibited nor discouraged by national policy. In addition, the analysis of flows indicates that the Plan Area is net self sufficient with respect to flows of other wastes, which suggests OCC need not be overly concerned providing that existing capacity continues to operate - and nothing in the capacity assessment indicates this not to be the case - and growth rates remain within modest levels.

Currently the WNA refers to the need to be self-sufficient and the need to meet proposed recovery targets 'in the same breath'. The WNA could benefit from clarifying the distinction between achieving net self-sufficiency and meeting the Plan's proposed targets, with reference to:

- the NPPW quote above, which recognises that new facilities will need to serve catchments area large enough to secure the economic viability of the plant, and

- the Planning Practice Guidance relating to the application of the Duty to Cooperate (DtC) on the identification of suitable sites and areas for waste management facilities: "*Effective cooperation will also be important in ensuring the planned provision of new capacity and its spatial distribution is based on robust analysis of waste management needs including for specific waste streams*." (PPG Paragraph: 017 Reference ID: 28-017-20141016).

It is entirely possible for both conditions to exist (be met) independently. i.e. if waste is travelling outside the Plan Area for management that satisfies a recovery target then there is no need to provide for that capacity within the Plan Area providing that access to that capacity has been confirmed for the Plan period with the receiving authority through the DtC process. The only test that then needs to be met to deliver net self-sufficiency is that the Plan Area is providing capacity for the management of a similar quantity of waste and is able to reciprocate throughout the Plan period . It was this argument that was accepted by the Inspector examining the East Sussex Minerals & Waste Local Plan when justifying long-term reliance for landfill out of the Plan Area by making compensatory provision for recovery capacity within.

This is intended to avoid over provision of capacity (see Paragraph: 007 Reference ID: 28-007-20141016 PPG) and recognises that different constraints and opportunities may prevail in different Plan Areas. PPG Para 017 makes specific reference to Green Belt but it might equally apply to provision of landfill capacity where underlying geological conditions are unsuitable. WPAs are encouraged to work together to achieve the overall goal of self sufficiency. In the case of Oxfordshire this may be met through continued provision of landfill capacity which is in short supply in the South East as a whole, providing the availability of suitable recovery capacity outside the Plan Area has been confirmed to achieve an overall drive of waste up the hierarchy.

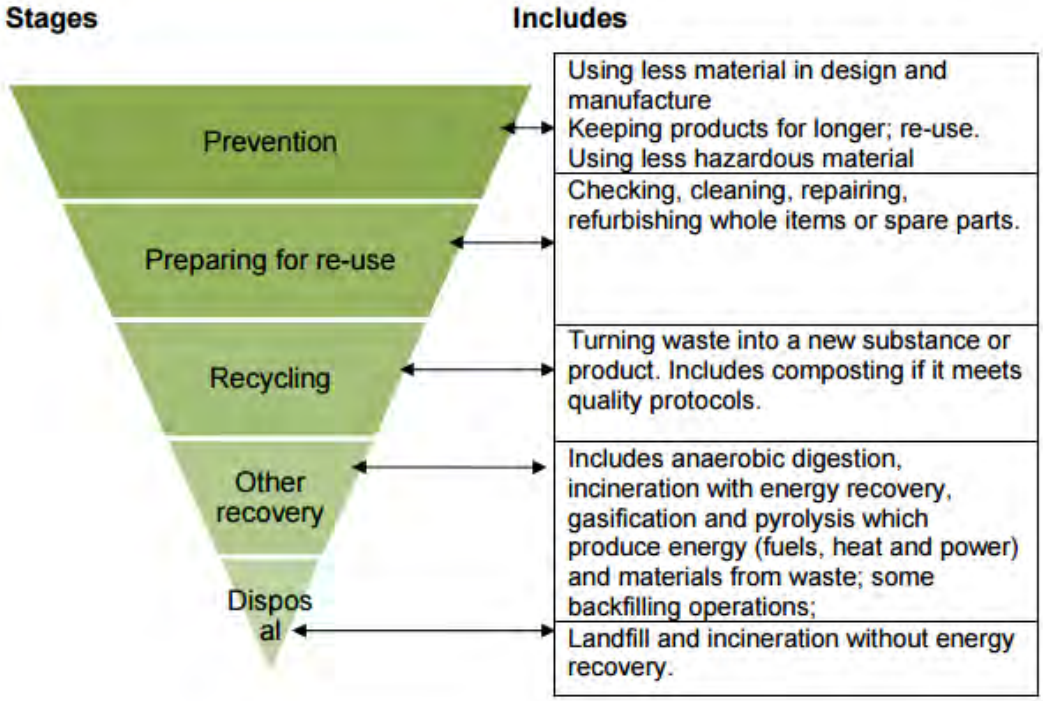
In connection with the proposed continued landfilling to restore existing mineral voids in Oxfordshire we also note the absence of policy dealing with landfill - in particular the Landfill Directive and the BMW diversion targets in particular and the Landfill Tax - a critical policy measure to promote diversion of waste from landfill - is not included in this section. It is suggest the following be inserted to clarify the policy landscape:
" The EU Landfill Directive introduced diversion targets for biodegradable municipal waste to be met in 2010, 2013 and 2020. In the past the diversion targets were applied at a local level through the Landfill Allowance Trading Scheme (LATS) - albeit for LACW only - with the threat of fines for non-compliance initially driving the provision of alternative capacity by Waste Disposal Authorities through their long term contracts. However, this scheme has now been scrapped and individual authorities no longer have legal obligations to meet the diversion targets. Rather the Government has placed reliance on the landfill tax as the key driver to divert waste from landfill to ensure that the diversion targets are met. While this has profoundly

influenced the direction of municipal waste management yielding substantive reductions on landfilling the National Waste Management Plan recognises that the targets: "*…does not mean that all wastes will be diverted from landfill by 2020. There are some wastes for which landfill remains the best or least worst option. The Waste Review 2011 suggested that such materials are likely to include:*

- *some hazardous wastes – such as asbestos;*
- *certain process residues, such as pre-treated industrial wastes from which no further resources can be recovered; and*
- *waste for which the alternatives to landfill are not justified on cost or environmental and resource efficiency grounds."*

The existence of consented voids requiring restoration might be said to justify landfilling on wider sustainability grounds. It is notable that accepting that possibility does not pose any risk of compromise to the overall objective of diverting waste from landfill since few if any new landfill facilities are being opened. Indeed work undertaken to support the East Sussex Waste Plan confirmed that with the landfill tax the industry no longer sees development of new landfill capacity to be commercially viable.

In addition, the clarification of backfilling of mineral workings as potentially a recovery activity in the National Waste Management Plan for England and the version of the hierarchy presented there and reproduced below provides more context for the subsequent policy. It is suggested that this might usefully be inserted to substitute for Figure 1 of the WNA as it provides important clarification on specifics.



3 Waste to be Managed

3.1 C&I Waste for Oxfordshire

Review the 'Point of Production' value

3.1.1 Revisiting Historical Values

The following Table is reproduced from the BPP Consulting Report produced in 2014[1] to provide a benchmark against which any value generated should be compared. Table 1 presents the historical values generated through different methods to estimate C&I arisings for Oxfordshire.

Table 1: Combined C&I Waste Arising Estimates for Oxfordshire

Source	Environment Agency (2000)	Environment Agency (2002/03)	ADAS	DEFRA	SEWPAG	BPP	SEWPAG
Year	1998/99	2001/02	2006/07	2009	2010	2011	2012
Value (tpa)	901,000	766,000-901,000	1,034,773	566,800	567,104	710,000	455,174

These values are plotted in Figure 1 with trend lines added for comparative purposes.

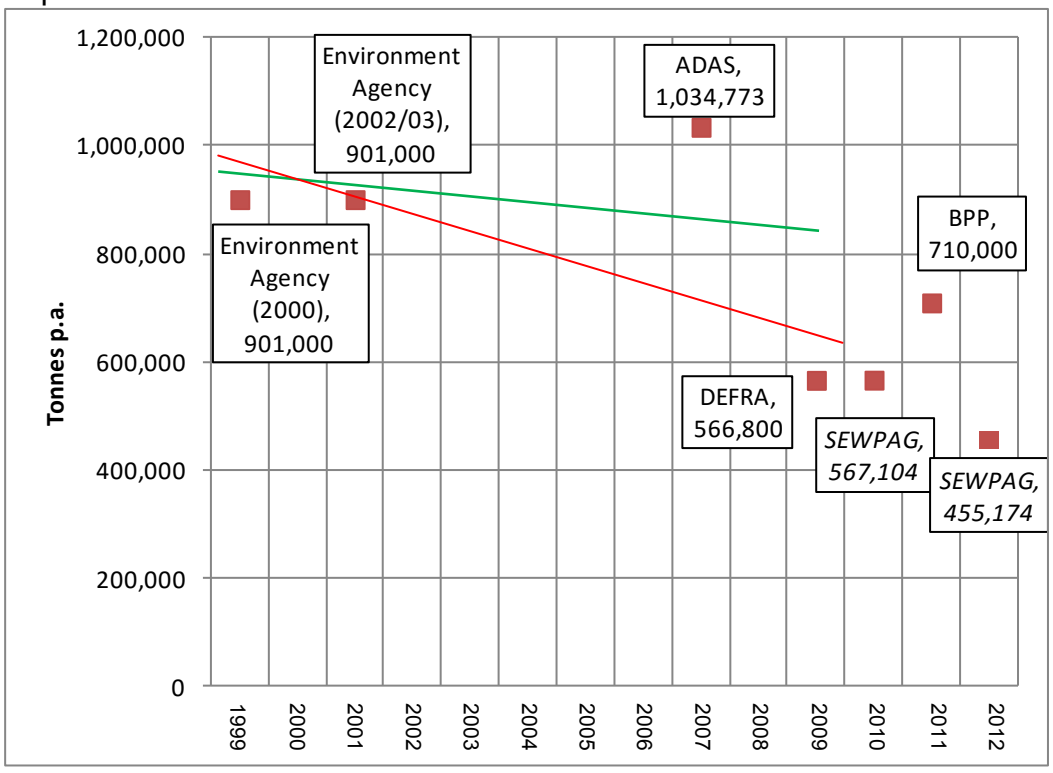


Figure 1: C&I Waste Estimates for Oxfordshire & Indicated Trends

[1] Baseline, Forecasts & Targets for Commercial & Industrial Waste Generated in Oxfordshire BPP Consulting Final Report Feb 2014.

3.1.2 Accounting for Didcot Power Station

As reported in the 2014 BPP Consulting Report at its peak production Didcot A Power Station burned around 7 million tonnes of coal each year giving rise to up to 1.2 million tonnes of ash[2]. Bearing in mind the closure of the Didcot A coal fired station in 2013 the value for waste production from this single larger power station was deliberately excluded from thump baseline calculation to eliminate the possible distorting effect this would have on the forecast using arisings value generated. If an element of the ash has been counted in previous surveys this will have inflated the overall arising figure presented in Table 1 against which the BPP baseline value was assessed.

In the absence of any firm evidence to the contrary, the 2014 BPP Consulting Report concluded that "The actual proportion of this ash that was counted as waste in previous surveys of commercial and industrial waste arisings is unknown." However, it has now come to the author's attention that the SWMA 2000 for the South East reports that just over 200,000 tonnes of the overall estimate of 901,000 tonnes for Oxfordshire was attributed to the Power & Utilities Sector.[3] Comparing that value with WPAs that didn't host coal fired power stations within the South East, the maximum value for waste generated by this sector is 32,000 tonnes (Hampshire) while the only other WPA in the South East hosting a coal fired station - Kent - declared a value of 390,000 tonnes. Therefore, it is clear that a substantial element of the value for this sector and hence the overall estimate for Oxfordshire, was in fact attributable to power station ash.

Interrogation of the dataset that yielded the 2006/7 estimate reveals that it also attributed Oxfordshire with a comparatively high production value for the sector so again appears to have included power station ash. The possible confounding effect of Didcot on the Defra 2009 estimate is not fully known, but examination of the data again shows a relatively high value recorded for the South East region as a whole for this sector. Table 2 below shows the values for the power & utilities sector generated by the three surveys for comparative purposes.

Table 2: Power & Utilities Sector Contribution to C&I Estimates (tonnes)

	EA 1998/99 Survey	**ADAS 2006/7**	**Defra 2009**
Source	SE SWMA 2000	ADAS dataset	Defra dataset
South East (tonnes pa)	678,000	1,086,999	708,342
Of which Oxon if specified (tonnes pa)	201,000	418,701	Not specified
% of SE Regional total accounted for by Oxon value	30%	38%	n/a

[2] Data source Residue Utilisation At Didcot Coal-Fired Power Station Best Practice Brochure 004 DTI February 2002

[3] Strategic Waste Management Assessment 2000: South Environment Agency based on 1998/1999 National Waste Production Survey

Applying the values generated in Table 2 to the estimations presented in Table 1 yields revised total estimates for C&I arisings in Table 3

Table 3: Oxfordshire C&I Estimated Arisings Adjusted for Didcor (tonnes per annum)

	EA 1998/99 Survey	**ADAS 2006/7**	**Defra 2009**
Original Oxon C&I Estimate (Table 1) rounded	901,000	1,035,000	567,000
Contribution of Power & Utilities sector (Table 2)	201,000	418,701	270,000 (applying ADAS 38% of SE Table 2 line 3)
Assumed Contribution of Didcot (row 2 minus 20,000 that is assumed to be from other utility contribution)	181,000	399,000	250,000
Total Adjusted Estimate excluding Didcot (row 1 minus row3)	720,000	636,000	317,000

It should be noted that while an adjustment was made in the BPP calculation to account for Didcot, the overall sector value that contributed to the 710,000 tonnes was 78,393 tonnes [4]- which is some 58,000 tonnes greater than that being assumed in row 3 of Table 2 above.
Therefore, for the purposes of this exercise to ensure direct comparison, the BPP 2011 estimate of 710,000 tonnes has been reduced by 58,000 giving a total of 652,000 tonnes.

The BPP 2014 report used the ADAS value as a comparator to test the realism of the Defra 2009 and BPP 2011 estimates respectively. (See Table 3 of the BPP 2014 C&I Report) This exercise has been run again excluding the assumed Didcot ash value for all sources giving growth rates as shown in Table 4:

Table 4: Comparison of Recent Verified C&I Waste Arising Estimates for Oxfordshire with ADAS Study Values

	Calculated Arisings (adjusted value)	**ADAS 2007 arisings (adjusted for Didcot)**	**Revised Implied Cumulative Growth Rate**
Defra 2009	317,000	636,000	-50%
BPP 2011	652,000	636,000	+2.5%

[4] The value generated in the BPP study using data supplied by DEFRA which cannot be disclosed due to confidentiality.

Looking at the revised implied cumulative growth rates in the table above while the minus 50% difference generated from comparison with the Defra 2009 value still looks overly low, bearing in mind the restructuring of the economy that has taken place since 2006/7 (when the original ADAS survey data was generated), the plus 2.5% from the BPP 2011 baseline starts to look like overly high value. That is it does not appear to reflect the expected reduction with the restructuring of the economy following the downturn. [5] This suggests a lower 'point of production' value may well be justified and this is supported by the trend line indicated in Figure 2 below.

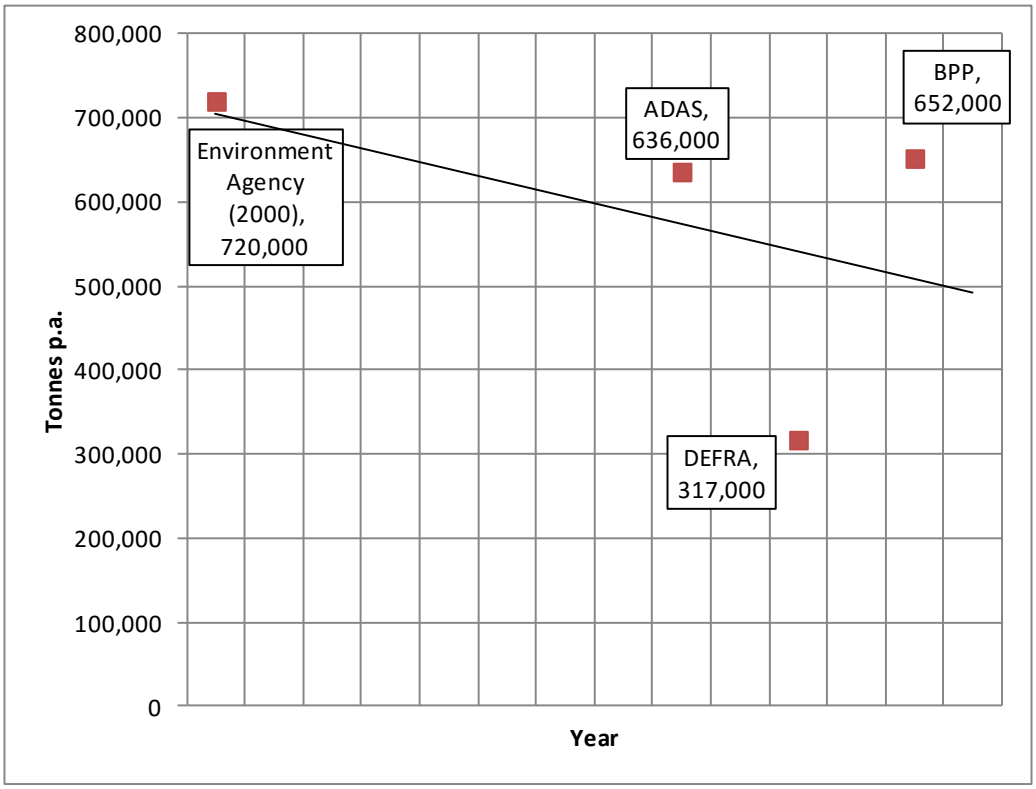


Figure 2: Revised C&I Arising Values exc Didcot and Resultant Trend Line

Produce a 'managed waste' baseline estimate as an alternative to the 'point of production' waste arising estimate used in the Core Strategy;

Since the production of the BPP report a revised approach to estimating C&I waste arisings on a national basis has been developed[6]. It is based on an 'as managed 'assessment drawing on a number of established datasets. It was produced for the express purpose of generating a "new and repeatable method for estimating commercial and industrial (C&I) waste arisings in England from existing data sources without the need to undertake extensive surveys of the C&I sector. The method is required to support decision and policy making as well as meeting regular data reporting requirements."

5

6 New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England DEFRA August 2014.

The national survey generated a national estimate of 47.9mtpa while the 'as managed' value generated by the new 'as managed' method was 37.8mtpa for the same year (2009). This corresponds to a difference of 21% between the two types of values. One would expect the 'as managed' value to be lower than the 'point of production' value since elements of C&I waste stream are dealt with on-site or may be backhauled direct to reprocessors.

Applying that same factor to the BPP 'point of production' value generated for Oxfordshire of 710,000 tonnes one would expect the 'as managed' value to be around 560,000 tpa. If the BPP point of production value adjusted for Didcot (652,000tpa) is preferred then the 'as managed value would be around 515,000 tpa.

3.1.3 Generating 'As Managed' Estimation using National Reconcile Methodology

The new national estimation methodology combined a number of datasets that are considered in totality to capture tonnages of commercial and industrial waste that is managed through:

(1) permitted waste management facilities (reporting through the Agency WDI & separately for EfW)
(2) exempt facilities (extrapolating from exemption register; and
(3) taking into account the proportion sent directly for export.

Deductions were made to eliminate:

(4) household waste (Local Authority Collected Waste reported through Wastedataflow);
(5) double counting at transfer facilities; and
(6) other non-relevant waste streams such as Agricultural, Mining, CDEW and Hazardous waste included in the datasets.

In summary the methodology assumes the following calculation:

C &I Generation =Σ (Inputs to specified permitted facilities +incineration inputs + exemptions + direct exports) -(household waste + construction, demolition and excavation waste (CD&E) + imports)

Considering the applicability of this methodology to the local level the following table presents observations on the key datasets:

Table 5: Relevance Assessment of Datasets from National Methodology to Local Assessment

Method Stage	Dataset Used	Relevance to Local Assessment	Include ?
Waste Sent to Permitted Waste Management Facilities	The EA Waste Interrogator for permitted waste facilities (landfill, treatment, transfer and, use on land). The Waste Interrogator identifies waste by EWC code, facility type and point of origin and also details fates for intermediate site outputs.	Yes	Yes
	Waste Data Flow to identify the proportion of household waste that is disposed at permitted waste management facilities reporting through WDI	Yes	Yes
Waste Received at Incineration Facilities	EA Waste Returns for Permitted Facilities, by EWC code identifies the quantity of waste that is received at incineration facilities	Yes	Yes
Hazardous Waste	The EA Hazardous Waste Interrogator dataset identifies the hazardous waste movements reported to the EA	Yes	Yes
	The EA hazardous waste producer registration system, records the SIC code of a producer and allows hazardous waste to be mapped by EWC and SIC codes for producers who generate more than 500kg per annum.	No - local population too small	No
Waste handled at exempt facilities	EA Permit exemption records,	Yes - although significant uncertainty around actual contribution	Partial
	National Packaging Waste Database	No - local data not held	No
Estimate direct exports	EA held import/export data,	Not relevant -	No
	HMRC import/export trade data	Not relevant - any international exports would pass through an intermediate site which would be captured-by the other datasets	No

The national methodology includes a code mapping and generation sector mapping stage but this is not considered necessary to achieve an overall estimate at Plan area level.

Taking each stage in turn and applying this methodology to Oxfordshire:

Step 1: Calculate waste sent to permitted facilities reporting through WDI

1a: EA Waste Data Interrogator (WDI)

First, the following elements need to be deducted from the headline value i.e. total quantity of waste recorded as being attributed to Oxfordshire in the Waste Data Interrogator 2014:

1. Mining & Agricultural Waste: Exclude all waste coded under Chapter 1 & 2 of the List of Waste
2. CDEW - Chapter 17, plus 19 12 09 (minerals (for example sand, stones) plus 20 02 02 (soil & stones)
3. LACW going to permitted sites as reported through WasteDataFlow.

Table 6 below shows this step by step

Table 6: Waste Data Interrogator Headline Input Value minus non C&I values (M&M + CDEW)

Source: EA WDI 2014 inputs to all sites from Oxfordshire

Step	Dataset	2014 Tonnage	Cumulative Total
	Headline Value for Oxon in WDI 2014	**2,377,839**	**2,377,839**
1ai	Minus Mining & Agricultural Waste	-33,698	2,344,141
1aii	Minus CDEW	-1,037,641	**1,306,500**

Table 7: Table 6 Waste Data Interrogator Value minus non C&I values (LACW)

Source: Table 6 plus WasteDataFlow management routes for Oxon LACW

Step	Dataset	2014 Tonnage	Cumulative Total
	Value for Oxon from Table 6		**1,306,500**
1aiii	*Minus LACW to permitted sites*		
	WDF total	*-330,386*	
	Plus EfW (as reported outside WDI)	*51,145*	
	Plus waste to exempt sites	*5,720*	
	Plus waste direct to reprocessors	*16,002*	
	LACW to permitted sites	-257,519	**1,048,981**

Then to avoid double counting:

4. Deduct movements to intermediate sites (transfer stations) within Oxfordshire:

The national methodology discounted inputs to all four types of transfer facility recorded in the Interrogator covering:

- 'Non-Hazardous Waste Transfer',
- 'Hazardous Waste Transfer',
- Clinical Waste Transfer' and '
- Inert Waste Transfer'

With the exception of tonnages identified as having a destination outside of England as these tonnages will not be managed by other facilities within the EA Waste Interrogator and therefore need to be included in the calculation.

Applying a similar logic to Oxfordshire, inputs to the four types of transfer facility within Oxfordshire were assessed against declared outputs. Since many sites classed as transfer actually undertake some processing, the difference between inputs and outputs is taken to be tonnage 'lost' as a result of some processing taking place on the transfer site. Therefore, the difference between input and output is to be counted as an arising, and therefore not deducted. The output has also been assessed against the origin of the input and apportioned accordingly e.g. where an input of 100 tonnes is attributable to Oxfordshire and this represents 50% of the total i.e. 200 tonnes, then 50% of the output value has been attributed to Oxfordshire.

Table 8: Waste Data Interrogator Value minus Transfer Station double counting

Source: Table 7 plus EA WDI 2014 Oxon site outputs

Line	Step	Dataset	2014 Tonnage	Cumulative Total
		Value for Oxon from Table 7		**1,048,981**
1	1aiv	Oxon input to Oxon transfer stations (ex HWRC)	187,229	
2		Out of Oxon input to transfer stations	97,323	
3		% of Oxon T Stn input from Oxon (Line 1/1+2)	66%	
4		Output from Oxon transfer stations	228,349	
		Tonnage of output attributed to Oxon input (66%) deducted to avoid double counting (line 4 x line 3)	**-150,710**	**898,271**

5. Deduct Waste from Waste Management Facilities

Waste treated prior to landfill at Material Recovery Facilities (MRF) and Mechanical Biological Treatment (MBT) plant for example is included in the national method. Outputs from these facilities are considered to be likely to be coded under LoW Chapter 19 (Wastes from Waste Management Facilities, off-site water and waste water treatment) and are deducted from the national estimates as part of the mapping to Eurostat sectors stage at the end. For the purposes of this method applied to Oxfordshire, it is deducted for intermediate sites other than transfer stations (already addressed above) as the sector mapping stage is not being included.

The principal stream of concern is wastes resulting from mechanical treatment of waste (Coded under LoW 19 12 12) and the WDI 2014 input data indicates that 95,259 tonnes of this was sent from Oxfordshire primarily to landfill sites. Of this, 59,901 tonnes went to sites within Oxfordshire, so presenting the risk of double counting. Analysis of the producers within Oxfordshire of this waste type confirms this, as it indicates that 76,848 tonnes was produced by non-transfer intermediate

sites in 2014, of which 52,569 tonnes was managed within Oxfordshire by methods other than transfer. However, an element of this will arise from the CDEW stream inputs, so in order to avoid double counting this element within the C&I waste stream estimation and that undertaken for CDEW stream estimation, the proportion of inputs to the source sites coming from non-CDEW sources has been assessed. The resulting value of 31,218 tonnes is deducted from the total.

Table 9: Table 8 Waste Data Interrogator Value minus Chapter 19 12 12 element

Source: Table 8 plus EA WDI 2014 Oxon site outputs

Step	Dataset	2014 Tonnage	Cumulative Total
	Value for Oxon from Table 8		**898,271**
1avi	Oxon WDI Chapter 19 Output Managed within Oxfordshire by non-transfer means attributed to non CDEW sources.	-31,218	
			867,053

Step 2: Account for Waste Received at Incineration Facilities

Tonnage data was provided by the EA for all waste received at incineration facilities identified as coming from Oxfordshire in 2014. The two principal receiving sites were Ardley within Oxfordshire and Lakeside EfW in Slough as follows:

Ardley 61,625 tonnes
Lakeside 6,158 tonnes
67,783 tonnes

The other sites reported as receiving waste from Oxfordshire received small quantities of hazardous waste totalling 1,125 tonnes.

Since the Oxfordshire WDA reported 51,145 tonnes of LACW went to EfW in 2014, that leaves 16,638 tonnes of non-LACW going to EfW - which is attributed to C&I stream so should be added to the total.

Table 10: Table 9 Waste Data Interrogator Value plus Oxfordshire waste sent to Incinerators

Source: Table 9 plus EA Incineration 2014 Oxfordshire dataset

Step	Dataset	2014 Tonnage	Cumulative Total (reducing)
	Value for Oxon from Table 9		**867,053**
2	Input to EfW plants	+16,638	
			883,691

Step 3: Account for Hazardous Waste

The national methodology then discounted all hazardous waste (as this is contained in a separate data set). This assumes that all hazardous waste movements recorded through the Hazardous waste Interrogator capture all recorded inputs to WDI reporting sites. However, in depth analysis of local datasets have demonstrated that this is not the case. A simple total for WDI site inputs recorded as hazardous (exc Ch 2& 17) generates a value of 575,991 tonnes. This compares with the HWI 2014 tonnage of 30,325 tonnes (exc Ch 2& 17). However, the WDI tonnage is skewed by a single value relating to remediation of groundwater on a single site (Harwell) of 542,501 tonnes. If this value is excluded, then the WDI total is 33,490 tonnes. Since the WDI value is larger than that obtained from the HWI, it is suggested that the WDI value should be used. However, in order to avoid reintroducing movements to transfer sites, these are excluded giving a value of 28,583 tonnes (33,490 minus 4,907 tonnes to transfer).

Table 11: Table 10 Value plus Oxfordshire hazardous waste

Source: Table 10 plus EA HWI 2014 Oxfordshire datasheet

Step	Dataset	2014 Tonnage	Cumulative Total (reducing)
	Value for Oxon from Table 10		**883,691**
3	Oxon WDI hazardous input	575,991	
3a	Minus single Harwell value	-542,501	341,190
3b	Haz input to transfer stations deducted to avoid double counting.	-4,907	**336,283**

Step 4: Waste handled at exempt facilities

There is no reporting of waste tonnage inputs to exempt facilities and so an estimate would need to be made using details of registered exemptions. For the purpose of estimating C&I waste that is handled through exempt sites, the national Reconcile method considered whether an exemption is likely to handle a significant volume of material not captured elsewhere in the facility chain to identify the activities that could make a notable contribution to C&I waste generation estimates. From a total of 57 exemption paragraphs, 21 were selected for inclusion in the estimates with the T4 exemption considered the most important and likely to handle the largest volume of waste.

The number of exemptions listed in the EA national database were reviewed and the number of exemptions exclusively for agricultural waste deducted, and for the majority of exemption types, also those that related to ‘both agricultural and non-agricultural waste’.

For the selected exemptions, a total annual tonnage per exemption was estimated using the assumed annual throughput per facility and the number of exemptions per paragraph as per the national method. Applying the above a total tonnage by EWC code was derived for exempt facilities, after which the estimated tonnage of waste managed at these facilities originating from Local Authority Collected Waste sources as reported through WasteDataFlow were subtracted so as to avoid double counting of the LACW derived element.

Applying the above methodology to Oxfordshire gives the following in Table 12 below:

Table 12: Summary of Number of registered exempt waste management activities within Oxfordshire

Source: EA Registration database to end of 2014 (numbers)

Step	Dataset	2014 Values
	Total Number of entries in exemption register at 31 December 2014 (1 Jan 2011-31 Dec 2014)	12,100
	Total Number of entries in exemption register for agricultural waste only	6,511
	Total Number of entries in exemption register for non exclusive agricultural waste	5,589

On close examination there are a substantial number of duplicate entries. Since it is only possible to operate under one exemption of each type at the same location at any one time these duplicates were screened out. This gave a revised total of 1,971 registered exemptions. The breakdown of the registered exemptions are summarised by type in Table 13.

Table 13: Breakdown of non exclusive agricultural waste registered exempt within Oxfordshite

Source: EA Registration database 2014

Exemption Code	Number Registered	Brief Description
D7	314	Bonfires
T1	73	Cleaning waste packaging for reuse
T12	9	Manual sorting, repair or refurbishment of certain waste products
T16	3	Treatment of waste toner cartridges and waste ink cartridges
T2	3	Laundering/cleaning waste clothes/textiles for reuse
T23	141	Compost heaps
T25	4	Wormeries for kitchen waste
T4	82	Baling. Shredding of certain recyclable materials
T6	273	Wood chipping or shredding
T8	12	Small scale tyre treatment e.g. baling or shredding
T9	49	Scrap metal processing
U10	372	Spreading waste on agric land to confer benefit
U11	62	Spreading waste on non-agric land to confer benefit
U12	137	Use of mulch
U2	29	Use of baled end-of-life tyres in construction
U4	127	Use of waste as a fuel in a small appliance like a workshop heater
U8	251	To allow waste to be used, where it is suitable for use without treatment. Specific uses include horse ménages, ornamental purposes, animal bedding.
U9	30	Use of waste to manufacture finished goods such a panelboard from waste woodchip

While the national method identified 21 exemption types that might manage C&I waste, only 18 of these were actually registered in Oxfordshire at the end of 2014.

The national method presents estimates for tonnages managed at each exemption type. The tonnages ascribed have been multiplied by the number of exemptions registered to give the result in Table 14 below.

Table 14: Tonnage attributed to non exclusive agricultural waste registered exempt within Oxfordshire

Source: Table 13 applying Defra Reconcile Estimation Method 2014

Exemption Code	Number Registered	Tonnes pa managed through each	Total Tonnes Managed (Theoretical)
D7	314	10	3,140
T1	73	1,200	87,600
T12	9	60	540
T16	3	50	150
T2	3	2,000	6,000
T23	141	400	56,400
T25	4	1,000	4,000
T4	82	3,000	246,000
T6	273	2,000	546,000
T8	12	60	720
T9	49	2,500	122,500
U10	372	200	74,400
U11	62	200	12,400
U12	137	600	82,200
U2	29	50	1,450
U4	127	10	1,270
U8	251	250	62,750
U9	30	2,500	75,000
Grand Total	**1971**		**1,382,520**

Hence the total tonnage of C&I waste ascribed as being managed through exemptions applying this method was circa 1.4 million tonnes per annum.

Overall, it is considered that it is unrealistic to include the value generated through the method in a 'to be managed' estimation of C&I waste. It should be noted that the values obtained are likely to be over-estimated for the following reasons:

1. exemptions are registered automatically on application at zero cost. Therefore, it is highly likely that the count is artificially inflated where registrants have registered one or a number, on a precautionary basis.
2. multiple exemptions may be registered on the same sites to cover a range of activities involving the same waste and hence there is scope for double counting. That is to say the same tonne of waste may be subject to a number of operations that are covered by different exemptions on the same site. Examination of the

Agency register data for Oxfordshire reveals many cases of this with up to 15 exemptions registered at a single location;

3. exemptions are registered for 3 years regardless of their actual lifespan so certain short term activities may still be registered even though they may have actually ceased;
4. some exemptions are only occasional e.g. bonfires are generally seasonal and therefore an assumption that they operate throughout the year may be fallacious.

In order to account for multiple entries at the same location the following methodology has been developed. Of the 1971 exemptions registered, only 314 were a single exemption registered at a single location. Where a single entry is made the exemption has been counted in full. This gave 314 entries with the breakdown shown in Table 15 below generating a total of 450,380 tonnes.

Table 15: Projected tonnages managed at single site exemptions registered in Oxfordshire end 2014

Exemption Code	Number Registered	Tonnage assummed through each	Total Tonnes Managed
D7	55	10	550
T1	1	1,200	1,200
T12	2	60	120
T16	3	50	150
T2	0	100	0
T23	9	2,000	18,000
T25	0	400	0
T4	26	1,000	26,000
T6	18	3,000	54,000
T8	0	2,000	0
T9	12	60	720
U10	138	2,500	345,000
U11	2	200	400
U12	4	200	800
U2	4	600	2,400
U4	4	50	200
U8	34	10	340
U9	2	250	500
Grand Total			**450,380**

A total of 383 locations had multiple entries these could be handling the same tonne of waste under different exemptions and therefore should not counted each time. Therefore a methodology which only selected the highest value entry for each location was devised. This generated a total of 835,060 tonnes. Hence the total theoretical tonnage managed at exempt sites was **1,285,440 tonnes** (450,380 + 835,060).

Comparing the derived value 1.28m tonnes against previous point of production arisings estimates for Oxfordshire shown in Table 1 (less than a million tonnes in total) strongly suggests that the value for exemptions is grossly in excess of the true value for waste managed through this route. Therefore it is considered that only a small proportion of the theoretical value indicated from the calculations above should actually be attributed to the C&I stream. What this might be is impossible to determine without further information resolving the uncertainties highlighted above - particularly the actual uptake of exemptions i.e. how many are registered but never used, and the actual tonnage managed i.e. how much of the theoretical capacity is actually used at those that are active, being such a major unknown. However, it is considered that sense checking the value arrived at against the DEFRA National Dataset provides some guide to estimation for the contribution this element may make.

3.1.4 Sense Check with DEFRA National Dataset

Two datasets are presented in the national estimate - one including waste collection, disposal and treatment. (Division 38) and one excluding activities relating to the waste management sector (to avoid double counting). The actual numbers are of less relevance than the relative contributions each of the 4 elements are estimated to make to the overall estimated value.

Table 16 below illustrates this.

Table 16: Breakdown of National Estimate of C&I Arisings including and excluding activities of the waste management sector

	inc wm	%	exc wm	%
Permitted	54,561	78%	32,037	73%
Incineration	2,822	4%	1,619	4%
Hazardous	3,270	5%	1,948	4%
Exemptions	9,405	13%	8,236	19%
Totals	**70,058**		**43,840**	

Applying a similar approach to the values obtained for Oxfordshire gives the following:

Table 17: Breakdown of Local Estimate of C&I Arisings excluding waste management activities

Element	Value (tpa)	Source
Permitted	291,062	Table 7 minus line 2+line3
Incineration	16,638	Table 5
Hazardous	28,583	Text
Sub-Total	**336,283**	Table 7

If exemptions are assumed to represent the same proportion (19%) as that shown nationally after wm activities are excluded this suggests a value of 77,790 tonnes giving an **overall total of 414,073 tonnes.**

Accounting for the Uncertainty
The key question for waste planning purposes is whether there is a significant likelihood that the exemptions will change substantially during the plan period such that substantial tonnages managed through them have to be provided for through the formal management system. The exemptions underwent substantial revision in 2010, it is considered unlikely the exemptions will change on a wholesale basis, with only minor amendments to fine tune or incorporate relatively minor activities expected. It should also be borne in mind that many exempt activities would not require express planning consent due to their ancillary and/or temporary nature.

3.2 Preliminary Conclusion

The value arrived at is just less than 415,000 tonnes. This value is substantially lower than might be expected when compared with the previous arisings values (suggesting a fall in arisings from the 2009 value known to be low due to recession) and the guide provided by the 21% difference between the DEFRA national 'as managed' and 'point of production' values. While one would expect it to be below the previous BPP generated value based on a 'point of arising' calculation (652-710,000 tpa), the initial value obtained applying the national Reconcile methodology at a Plan Area level appears to be low by comparison.

3.2.1 Accounting for Underreporting in the WDI

Data quality of the WDI relies on accurate reporting by operators down to WPA level. A number of sites do not account for inputs to that level or only accounts for some. This means that a significant tonnage of waste is not attributed down to or below regional level. In 2014 a total of 343,402 tonnes of waste inputs was not attributable below the South East region and 4.36 million tonnes was not attributable to regional level. Therefore there is considerable scope for loses in reporting waste actually from Oxfordshire.

Omissions Identified by Comparisons with Wastedataflow returns.
Since Wastedataflow returns are completed by local authorities it is taken to be a more reliable source than the WDI. The previous exercise reported in BPP 2014 discovered that LACW tonnages reported through WDF as going to certain landfill sites were under reported in the WDI. Comparison of the dataset obtained from WasteDataFlow for 2014 with WDI 2014 does indicate some omissions albeit on a more minor scale. For example, 7,512 tonnes of LACW reported in WDF as having gone to the Crapper & Sons Landfill Ltd site in Wiltshire does not appear in the WDI dataset against Oxfordshire. A check of the site inputs on the WDI shows all inputs are being recorded as coming from Swindon. Hence that value should not be deducted.

3.2.2 Attributing Unattributed Waste

1. Unattributed Inputs to Oxfordshire sites

Addressing unattributed inputs to sites in Oxfordshire the WDI indicates that 43,386 tonnes of waste was accepted at Oxfordshire sites that was not attributed below the South East regional level. Of this 41,906 tonnes was received at two sites, Banbury Transfer Station and Grundon Waste Management MRF. Closer examination of the attributed sources for these two sites shows that in the case of the former 98% of attributed inputs came from Oxfordshire. Therefore it would be a reasonable assumption that this site is primarily serving Oxfordshire and the unattributed tonnage of 18.269 tonnes should be attributed to Oxfordshire too. In the case of the latter site 78% of attributed inputs came from Oxfordshire. This suggests the site is serving a wider catchment than solely Oxfordshire and therefore only 78% of the unattributed value would be attributed to Oxfordshire i.e. 23,637 tonnes x 78% = 18,552 tonnes. This gives a total of 36,821 tonnes to be added to the total above plus the unattributed Crapper landfill value of 7,512 tonnes giving a revised total for waste managed at permitted sites of 335,395 tonnes. If this revised figure is input into Table 18 below.

Table 18: Breakdown of Local Estimate of C&I Arisings excluding waste management activities

Element	Value (tpa)
Permitted	335,385
Incineration	16,638
Hazardous	28,583
Sub-Total	373,104

If exemptions are assumed to represent the same proportion (19%) as that shown nationally after wm activities are excluded this suggests a value of 88,045 tonnes (or giving an **overall revised total of 468,661 tonnes.**

2 Unattributed Inputs to sites outside Oxfordshire receiving Oxfordshire waste

Examination of WDI data for sites outside Oxfordshire shows that there are three sites that received over 1,000 tonnes of waste from Oxfordshire in 2014 and received over 10,000 tonnes of waste not attributed below South East attribution. Applying the same logic as that used for the in-Oxfordshire sites the inputs were examined. In all three cases it was found that the only WPA to which inputs were attributed was Oxfordshire. This would suggest that all the unattributed waste should also be allocated to Oxfordshire. On that basis a further 52,627 tonnes could be added to the Oxfordshire 'as managed' total.

Repeating the process presented above this would give the following total:

Table 19: Breakdown of Local Estimate of C&I Arisings excluding waste management activities

Element	Value (tpa)
Permitted	388,022
Incineration	16,638
Hazardous	28,583
Sub-Total	433,243

If exemptions are assumed to represent the same proportion (19%) as that shown nationally after wm activities are excluded this suggests a value of 100,219 tonnes giving an **overall revised total of 533,462 tonnes.**

This value corresponds to between a 18% to 25% difference on the 'Point of Production' values generated (i.e. 652,000 tonnes and 710,000 tonnes). The mean between these values of 21% directly matches the reduction between the 'Point of Production' and 'as managed' values nationally.

3.3 Conclusion

National government made a decision to switch from a 'point of production method to an 'as managed' method to estimate C&I waste arisings. This came from a need to develop a simplified and more directly relevant method for EU reporting purposes. This need has a parallel with the needs of Plan making authorities. In particular, the need to monitor and report on arisings on an annual basis, through their Authority Monitoring Reports, to ensure the forecasts against which capacity needs will have been assessed are still realistic.

A 'point of production' arising estimate might be potentially useful if it is anticipated that current arrangements for management that fall outside the permitted system are likely to change. For example, when the Landfill Directive was introduced many industrial sites operating their own in-house landfills closed them resulting in significant quantities of waste that had previously not been planned for, requiring management offsite through the 'established' system.
A similar situation arose when crown immunity was removed from waste incinerators located on hospital sites in the 1990's. However, it is not considered that any 'future shock' events such as these are likely to occur going forward so consideration of production at source is not considered to be necessary for effective local planning.

Having said that, there is considerable uncertainties associated with the 'as managed' value in particular arising from under-reporting in the WDI plus the unknown of exemptions. While these introduce uncertainty it can be said that any value generated solely reliant on the WDI can be considered an underestimate. The above working suggest that as much as a further third should be added.

3.4 C&I Waste Forecasts

3.4.1 Projected Growth Rates

The National Planning Practice Guidance on Waste recommends that:

"Waste planning authorities should assume a certain level of growth in waste arisings unless there is clear evidence to demonstrate otherwise." Paragraph: 032 Reference ID: 28-032-20141016

This suggests that in the absence of local data indicating to the contrary, a positive growth rate should be assumed.

The latest forecasting work by DEFRA[7] projects C&I arisings for England to 2020 using the national 2009 survey data as a baseline. Revised upper, lower and central forecasts were produced to 2020 defining what might be called a 'cone of possibility'. These are shown in Figure 3 below.

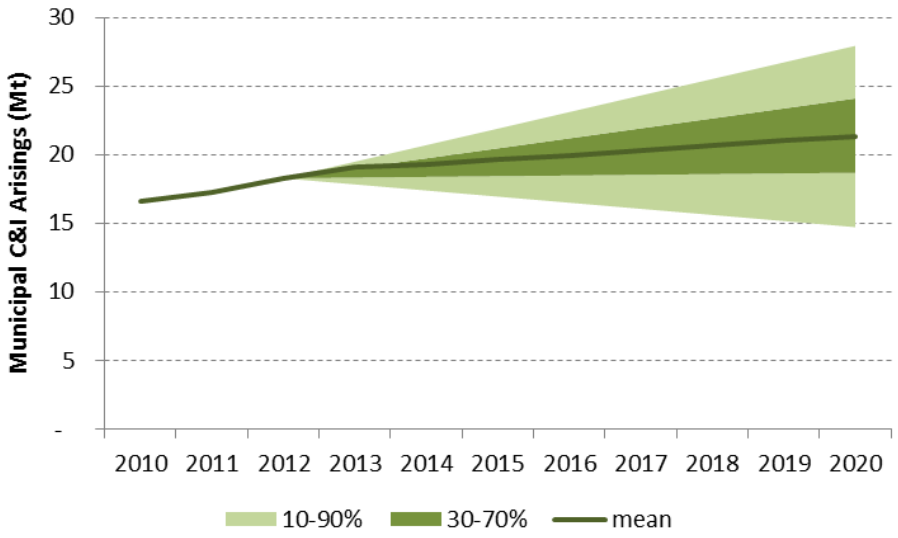


Figure 3: Municipal and C&I Arising Forecasts for England to 2020

Source: Defra Forecasting Report (2014)

Each of the forecasts present relatively linear trajectories. This is in distinct contrast to that generated in the 2013 version where they were represented by a 'drooping' curve.

Of most significance is the fact that two of the three projections in the 2014 forecast reach values in 2020 that are greater than the arisings baseline figure for 2010. As a consequence the mean arisings value is higher than the 2010 value.

[7] *Forecasting 2020 Waste Arisings and Treatment Capacity* Revised October 2014 Report DEFRA Analysis to inform the review of Defra financial support for the Hertfordshire County Council residual waste treatment project.

This reflects the use of new arisings estimates for 2012 and that wider economic forecasts predict growth. This is in contrast to the previous version released by Defra referenced in BPP 's report of last year where all three forecasts projected a fall in arisings in the initial period with two of the three arriving at a point where values in 2020 were lower than the original starting baseline value.

The scenario range seeks to make some provision for the possibility that, a more pronounced than expected economic recovery could potentially cause waste arisings to increase compared to past trends. To reflect such an eventuality, the possibility of an upward 'future shock' to arisings trends has been included in the analysis. The quantum of this shock is based on a reversal of the observed downward shift in waste production that occurred after 2002-03. A 20% upward shock is used, occurring with a probability of 20% between now and 2020. Therefore, when the upward shock occurs in the analysis, it shifts the distribution of waste arisings forecasts upwards by 20%.

Applying the growth trajectories generated nationally to Oxfordshire using the 2014 'as managed' baseline value produces the forecast ranges shown in Figure 4 below:

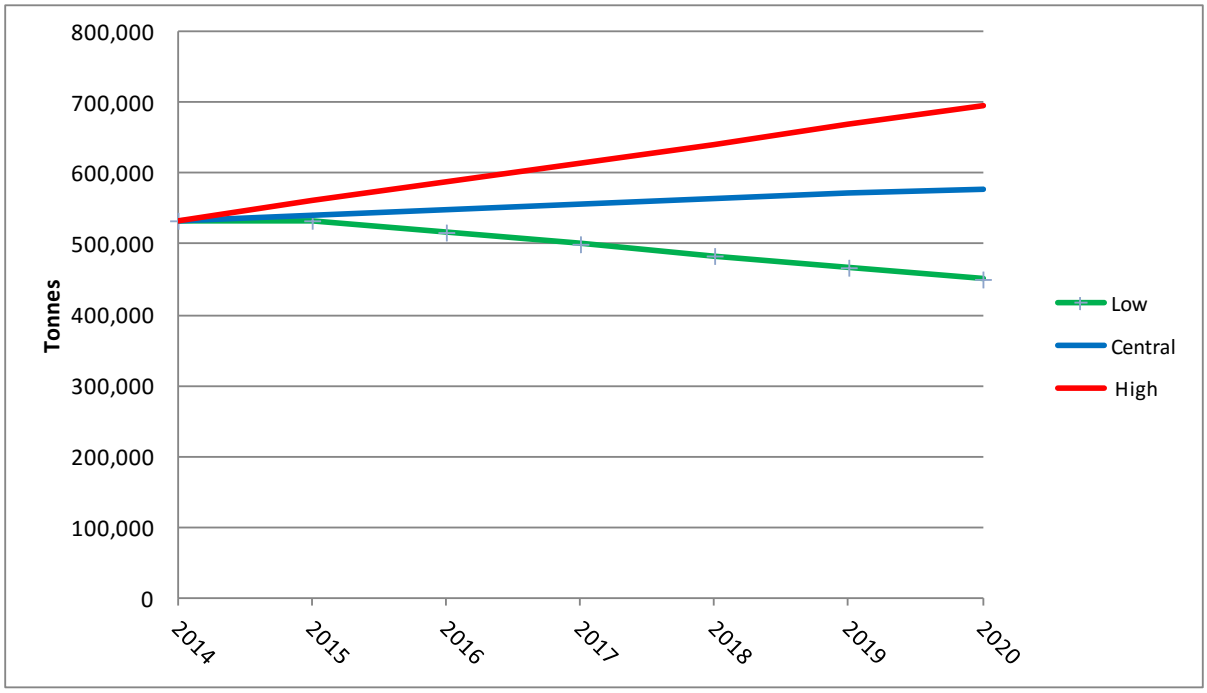


Figure 4: C&I Arising Forecasts for Oxfordshrie derived from DEFRA C&I Arising Forecast (tonnes per annum) (After Defra Forecasting Report 2014)

The curves shown correspond to the following growth rates:

Table 20: Growth Rates for Oxfordshire to 2020 derived from DEFRA C&I Arising Forecast

	Growth Rate over 6 yr period	**Compound Annual Growth Rate**	**Tonnage at 2020**
Lower	minus 16%	minus 2.78%.	450,500 tpa
Central	plus 8%	plus 1.4%	578,400 tpa
Upper	plus 30%	plus 4.51%.	695,200 tpa

This shows that two out of three C&I waste forecasts for 2020 predict 'as managed' arisings would be greater than the 2014 value. This is in contrast to the forecast curves generated in the 2013 forecast[8].

The difference between the lower and the higher estimate is 245,000 tonnes at 2020. This seems quite an extreme range to develop over a 6-year period and it is considered that it is overly exaggerated. It can be understood because the modelling takes into account the possible effect of an upward future shock of the order of 20%. However as the time span of the forecasts reduce (from the national original 8 yrs 2012-2020 down to 6 yrs 2014-2020) the likelihood of such shocks occurring without any forewarning reduces and hence it is reasonable to assume that providing for such a wide range is not necessary.

As the above forecasts are based on UK predictions, they do not acknowledge local economic conditions. Therefore the BPP 2014 report presented the outcome of examination of a set of local forecasts produced by OCC for economic development in Oxfordshire have also been examined[9]. This proposed three forecasts as follows: baseline; higher population growth; and policy driven. It should be noted that economic activity is measured by employment in these studies. This is considered to be a less reliable indicator than GVA when using economic data in forecasting waste arisings. GVA was used in the Defra forecasts.

The BPP 2014 report applied the projected OCC study growth rates through to 2031 on a sector by sector basis to the Oxfordshire C&I baseline data (2011). As the revised baseline is based on an 'as managed' value it is not possible to replicate the process with such precision. However if it is assumed that the waste managed is to the same profile i.e. composition remains identical, then the method can be applied by using the growth rates derived (presented in BPP 2014 Tables 5 & 6).

[8] Forecasting 2020 Waste Arisings and Treatment Capacity Revised February 2013 Report DEFRA October 2013

[9] Economic Forecasting to Inform the Oxfordshire Strategic Economic Plan and Strategic Housing Market Assessment Final report for Vale of White Horse District Council and partners 5 December 2013 DRAFT

Table 21: C&I Arising Forecast Growth Rates & Corresponding Tonnages for Oxfordshire 2014 to 2031 (tonnages rounded to nearest '000')

	2021		2031	
	Growth Rate over period	**Tonnage**	**Growth Rate over period**	**Tonnage**
Baseline (Lower):	plus 1.57%	542.000tpa	plus 1.98%	553,000tpa
Higher Population (Mid)	plus 1.68%	542,000 tpa	plus 2.29%	555,000 tpa
Policy Driven (higher):	plus 3.92%	554,000 tpa	plus 3.37%	573,000 tpa

This generates the results shown in Figure 5 below.

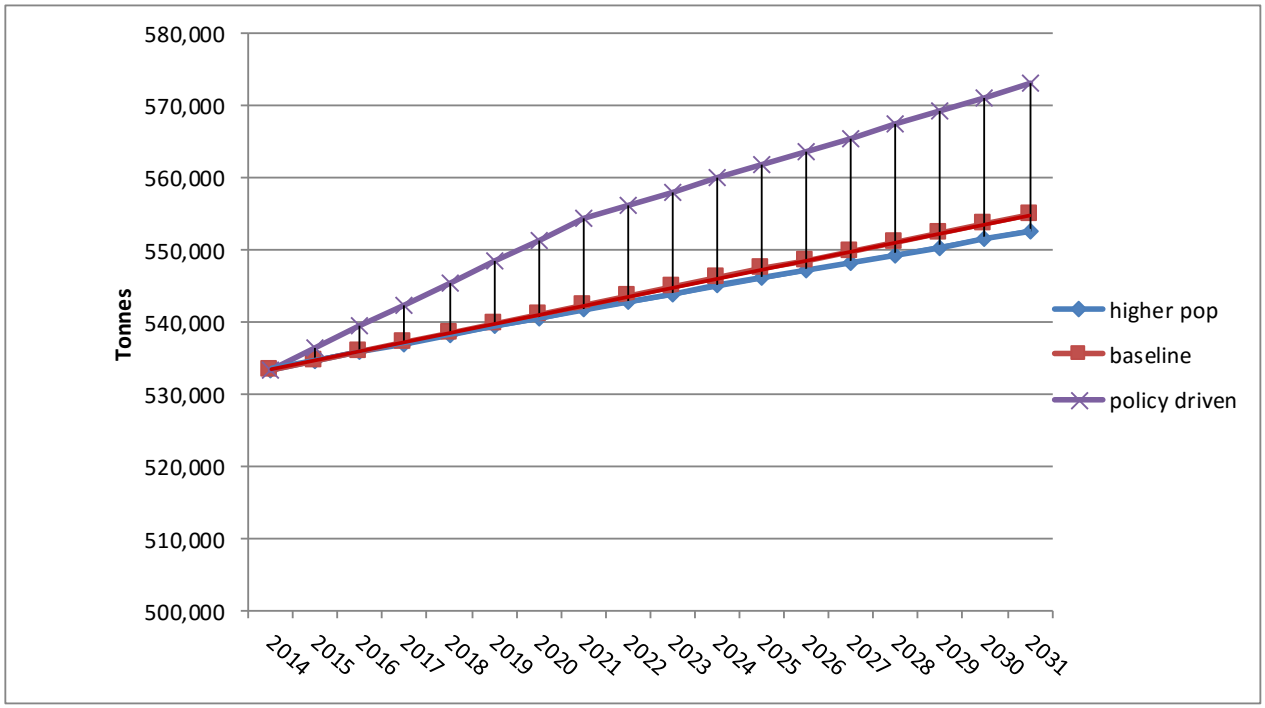


Figure 5: C&I Arising Forecasts for Oxfordshire to 2031 Applying OCC Forecast Growth Predictions to amended baseline

(After OCC Forecasting Report 2013) NB: y axis scale not at zero.

This suggests a difference at 2021 of 12,500 tpa rising to 20,500 tpa at 2031.

3.4.2 Combining the Two Datasets

In BPP 2014 the Oxfordshire economic forecast-based datasets were considered to offer a very limited range of growth possibilities to explore, while the Defra-based forecasts resulted in a fall in arisings in all but one of the scenarios. This was considered to be an overly conservative position when considering the relative resilience shown by the Oxfordshire economy in the face of the recession illustrated by consistent growth in GVA. Hence the local and national growth rates were combined to achieve a range of possibilities that provide flexibility to account for potential growth in Oxfordshire and therefore make provision for a greater quantity of C&I waste to avoid running the risk of underprovison.

The updated Defra forecast now indicates growth in two of three scenarios and it is now considered that the central scenarios forecast presents a reasonable optimistic prediction.

Table 22: C&I Arising for Oxfordshire: Proposed Forecast Growth Rates

	Compound Annual Growth Rate to 2020	**Source**	**Compound Annual Growth Rate 2021 to 2031**	**Source**
Lower	0.16%.	OCC baseline	0.2%.	OCC baseline
Central	0.39%.	OCC policy driven	0.33%.	OCC policy driven
Upper	1.16%.	Defra Central	0.2%.	OCC baseline

Applying these growth rates yields the following tonnages

Table 23: C&I Arising for Oxfordshire Applying Preferred Forecast Growth Rates
(tonnages rounded to nearest '000')

	Tonnage at 2021	**Increase on 2014**	**Tonnage at 2031**	**Increase on 2021**	**Total difference**
Lower	542,000	9,000	553,000	11,000	20,000
Central	553,000	20,000	572,000	19,000	39,000
Upper	593,000	60,000	605,000	12,000	72,000
Diff	51,000		52,000		
Mean		30,000		14,000	

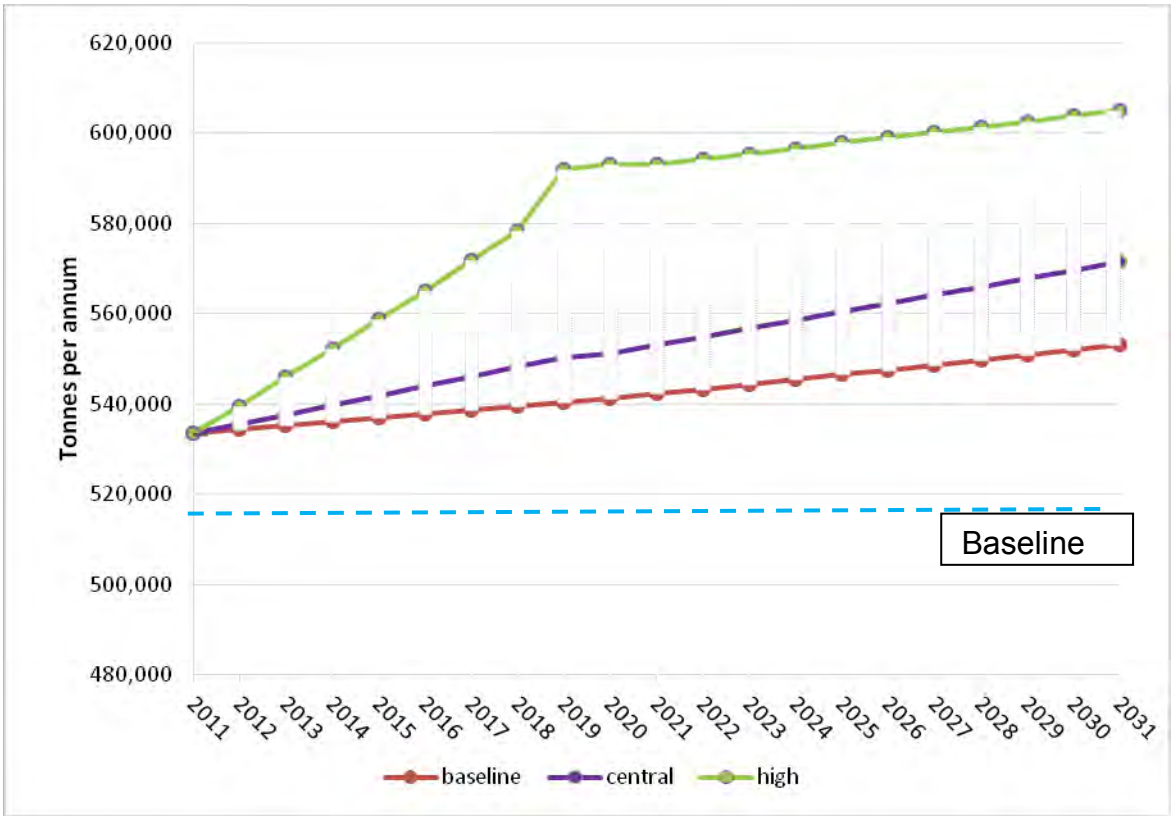


Figure 6: C&I Arising Forecasts for Oxfordshire to 2031 Applying Combined Growth Factors
NB: y axis scale not at zero.

3.4.3 Conclusions on Commercial & Industrial Wastes Arisings

To provide flexibility and help ensure that the market has sufficient opportunities to develop facilities, it is considered prudent to provide for waste management capacity based on predicted levels of waste arisings that follow a positive growth path. This is consistent with the advice given in the National Planning Practice Guidance on Waste. However the uncertainty associated with such predictions is apparent from the shift in the national scenarios produced by Defra in 2013 and 2014

The selected forecasts show moderate growth with the highest showing a final maximum figure in 2031 72,000 tonnes above the revised 2014 baseline. This represents capacity of one moderately sized facility or two smaller facilities. However it is suggested that to moderate the growth rate in the early part of the plan period the mean of the values be taken giving a capacity requirement as follows:

- 2021 30,000 tonnes
- 2031 19,000 tonnes

Hence the predicted additional need might be reduced to provision of a single moderately sized additional facility by 2021 after which it is recommended that needs be monitored against and adjusted accordingly. This fits with the Plan commitment to a rolling review on a 5-year cycle.

3.5 Proposed C&I Waste Targets

The OCC Proposed Submission Core Strategy August 2015 proposed a progressive reduction in landfilling of C&I waste such that the following profile is achieved:

Table 24: Proposed C&I Waste Landfill diversion Target Proposed in OCC Submission Core Strategy August 2015

	2016	2021	2026	2031
Landfill	25	10	5	5
Implied Landfill diversion	75	90	95	95

These targets appear to be quite ambitious by comparison with the 5 comparator WPAs in Table 26 (taking combined recovery targets as the implied landfill diversion rate where an explicit one is not specified) and rely on the development of alternative capacity within Oxfordshire, the availability of existing capacity or availability of surplus capacity elsewhere. It should be noted that since C&I waste does not tend to be contracted for extended periods (a rolling year is the norm), given the choice between serving LACW markets or C&I market, most facility operators will prefer LACW. Therefore, given surplus capacity being available at Oxfordshire's own non-landfill capacity, it is probable this would be filled by imports of LACW rather than substantive indigenous C&I inputs in the first instance. This assertion is supported by the fact that inputs to the Ardley ERF from Oxfordshire are solely LAWC and the remainder comes from outside the county, this then leaves C&I to the spot market, which may tend towards landfill if capacity remains readily available.

The profile proposed in the Core Strategy is shown below with a heavy reliance on dry recycling, the growth of treatment and the stable retention of a low level of organic (bio)waste treatment.

Table 25: Breakdown of non Landfill Management Target Proposed in OCC Submission Core Strategy August 2015 (%)

	2016	2021	2026	2031
Composting & food waste treatment	5	5	5	5
Dry Recycling	55	60	65	65
Treatment of residual waste	15	25	25	25

With inherent instability in recycling markets, it might be questionable whether reliance on dry recycling to such a degree is sustainable in the long term.
While there are targets for elements of the C&I waste stream, such as the Packaging Waste Directive, few if any actually necessarily require the waste produced by businesses within Oxfordshire to actually be separated for recycling since proof of compliance from waste managers outside the Plan Area can simply be purchased instead, which may be likely if it is more economically advantageous.

The adoption of the landfill diversion targets proposed seems quite ambitious but could be achievable given availability of alternative capacity. We suggests that actual timings be set by comparison with the predicted availability (depletion) of consented landfill void.

3.5.1 Comparing proposed targets with those adopted by up to 5 comparable Waste Planning Authorities;

The following table summarises the approaches taken to recycling targets by selected WPAs.

Table 26: Comparator WPA targets for C&I waste

Authority			Milestone Year				
	Target Type	Baseline Value	2016	2021	2026	2031	Comment
Devon County Council	Recycling (inc composting)	55 (2009)	58	60	62	64	
Suffolk County Council	Recycling (inc composting)	67 (2009/10)	75	75	75	75	
Cambridgeshire County Council	Recycling (inc composting)	75 (2010)	84.2	88	88		
	Recovery		92	99	99		
Warwickshire County Council	Recovery	Not specified	75.8	75.8	75.8		
	Max landfill	46 (2002/03)	30	25	25		RSS
Buckinghamshire County Council	Recycling (inc composting)	Not specified	55	60	65		RSS
	All Recovery	Not specified	75	81	84		RSS

Assessment: The OCC Plan of February 2014 proposed the following targets:

Table 27: Management route Targets Proposed in OCC Plan of February 2014

	2010	2015	2020	2025	2030
Recycling composting & food waste treatment	50	60	65	70	70
Treatment of residual waste	0	15	25	25	25
Landfill	50	25	10	5	5

The 2014 BPP report reached the following conclusion:

> "The analysis indicates that the target of 70% recycling or composting of C&I waste by 2025 proposed in the OWNA is ambitious. Indeed, if the lower baseline estimate is applied, then it could be overly ambitious and it may be advisable to extend the timescale for delivery of the target to nearer the end of the Plan period.ie 2030.

The ambition of the proposed target will be more challenging were the lower baseline to be realised and combined with higher growth forecasts. This would require provision of approaching 200,000 tonnes of capacity over the period at an initial rate of 50,000 tonnes every four years to 2025. This may present a challenge in terms of availability of deliverable sites and the market ability to deliver to the Plan. Therefore, we suggest the target be reviewed to align with the approach proposed in the West Sussex WLP but with a target of 65% by 2025 and the 70% target being set for the year before the end of the Plan period i.e. 2030."

The Proposed Submission Core Strategy proposes the following targets:

Table 28: Management route Targets Proposed in OCC Submission Core Strategy August 2015

	2012	2016	2021	2026	2031
Composting & food waste treatment	0	5	5	5	5
Dry Recycling	50	55	60	65	65
Treatment of residual waste	0	15	25	25	25
Landfill	50	25	10	5	5

Assessment: When comparing the proposed targets with those adopted by other WPAs they do not appear to be excessively ambitious given development of appropriate infrastructure. Indeed, the R&C target of 70% appears to be relatively conservative when compared with those proposed by the WPAs with corresponding targets - Cambridgeshire (88%), and Suffolk at 75%. However, the concern raised by BPP related more to the proposed rate of increase rather than the actual target itself. This was on the basis that there is a considerable range of uncertainty associated with the actual R&C rate of C&I waste. If the lowest value were found to be true, then meeting the target was considered to be challenging. To over-provide R&C capacity runs the risk of facilities becoming unviable and is to be avoided. This has occurred in a number of instances in the South East (Ideal Paper MRF Kent, D S Smith MRF Hants).

It should also be borne in mind that dry recycling of a tonne of waste does not necessarily require a tonne of dry recycling capacity to be provided within Oxfordshire if waste is source segregated as is now required by law for the principle fractions. Separated fractions can be directly transported to a suitable reprocessing facility outside Oxfordshire, or bulked up within Oxfordshire for onward transportation and 'MRFing'. Such bulking facilities may not require planning consent as waste management facilities being considered B2/B8 uses[10] and therefore may not need to be provided for in the Waste Plan.

[10] The Planning Portal Guidance Notes for Waste Management Applications states "Applicants should not automatically assume that an application for waste development will be sui generis and should consider whether the processes their facility will use could be considered to be a B1, B2 or B8 industrial process."

3.5.2 Splitting C&I R&C target for dry recycling and composting/food waste treatment

Drawing on the results of the Defra 2009 survey the National Waste Management Plan for England 2013 in Figure 2 assesses the organic element of C&I as 13% of the total arisings. If it were to be assumed that all that material could be effectively captured for separate treatment then that suggests between 69,400 (using the 'as managed' value and 92,000 tonnes (using the original point of production value) of biowaste might be available for capture each year. This would equate to a single medium/large size facility or two small/medium facilities.

Realistically only a proportion of the theoretically available biowaste will actually be available however. The current proposed target suggest 5% of the total stream be provided through this route which is just under 40% of the material theoretically available. This is considered to be a reasonably achievable estimate although might be increased over time as:

- other materials get separated out leaving biowaste more available in the residual waste steam; and
- the wider adoption and establishment of separate collection rounds for food waste from businesses.

It is notable in this context that the Hospitality & Food Service Agreement brokered by WRAP commits signatories to increase the overall rate of food and packaging being recycled, sent to anaerobic digestion or composted to at least 70% by the end of 2015. This would equate to a target of 9% of the whole C&I waste stream assuming that the whole target was met by biowaste and not packaging.

3.6 Revisiting CDE Waste Baseline

3.6.1 Baseline

- Adopt the method for establishing the CDEW baseline to reflect that now used to estimate CDEW arisings nationally for Waste Statistics reporting purposes.
- Assessment of permitted site inputs and flows, relating to waste originating in Oxfordshire and associated management requirements using Waste Data Interrogator and Exempt site listing for the year 2014.
- Review and integration of recycled aggregate data sources as reported through the latest Local Aggregate Assessment (LAA). Update to include use of most current industry sources.

BPP Consulting defined a baseline value for CDE waste production of 1,358,000 tonnes using data for 2008/9. This was a Point of Production - rather than management - estimation using construction activity statistics data as a proxy for waste production. This was considered to provide the best available estimate at that time. However, the Government no longer produces the construction activity statistics data down to sub-regional level and it is therefore not possible to reliably replicate the method used by BPP to generate a value for 20142.

3.6.2 Revised Estimate of Baseline Arisings

The method used to derive an arisings figure for 2014 is based on the methodology [11] developed by Defra for measuring CDEW arisings across the UK to report on progress made towards meeting the revised Waste Framework Directive (rWFD) target.

The method has been modified from that applied to generate the national baseline for a number of reasons. In particular:

1. The age of the original source data used to generate values for CDEW converted to recycled materials inc aggregates and soil. This was based on the DCLG survey originally conducted in 2004.
   As this data is over a decade old it cannot be said to represent the "best available" dataset on which to base this, and subsequent, baseline calculation exercises.
   In addition, with the introduction of permitting of activities involving the management of CDEW which were formerly exempt, such as use in

[11] Methodology for estimating annual waste generation from the Construction, Demolition and Excavation (CD&E) Sectors in England 20th March 2012
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/119680/CDE-generation-methodology.pdf

construction and soil screening, greater reliance can be placed on the Environment Agency's Waste Data Interrogator dataset that reports on waste managed at permitted sites, so this data is to be used instead.

2. A recent change in definition of 'inactive' waste as it applied to residues from the treatment of CDEW, commonly referred to as 'trommel fines', under the landfill tax. Previously much of this material leaving 'intermediate sites' e.g. transfer stations would have been classed as soils (17 05 04) as it would go for use in restoration, however, since the clarification of the definition of 'active' waste a significant quantity of this material is now classified as residues from mechanical processing (19 12 12). Since CDEW is primarily defined as Chapter 17 waste a proportion of outputs formerly counted as CDEW (being 17 05 04) has been reclassified as non CDEW waste (19 12 12). To account for this 'loss' it is considered appropriate to include a proportion of this class of waste that is leaving intermediate sites located in the Plan Area which treat C&D waste within the calculation.

3. It is considered that direct application of the national estimation approach applied by Defra for accounting for flows to and from intermediate sites (outputs minus inputs) is inappropriate to apply at Plan Area level (because flows are at Plan Area level), but it is considered appropriate to factor in flows of waste arising in the Plan Area which are transported to intermediate sites beyond the area.

The table below considers all the elements which contribute to the baseline calculation and considers issues which may lead to inaccuracy. The elements of the calculation considered are:

- Waste dealt with at facilities-such as transfer stations and treatment sites where waste is passed on for management at a different facility referred to as 'intermediate facilities'.
- Waste sent to landfill sites
- Waste recovered at formerly exempt sites
- Waste processed as recycled aggregate

Table 29: Critique of Defra Estimation Methodology and approach adopted to generate 2014 CDEW Baseline Arisings Value

Element	Element of baseline calculation	Method of calculation	Comment	Proposed value for use in 2014
1	**Waste dealt with by intermediate sites**	Waste inputs to non Plan Area sites	The approach taken when calculating on a national basis is to simply take output values away from input values for the whole UK intermediate site estate. However, this method is problematic when dealing at Plan Area level as the value assumes that the transfer stations and treatment facilities which received Plan Area waste did not receive waste from any other areas. If they did, then there is no certainty that the output material originally arose in the Plan Area i.e. one cannot be sure if any difference between the input and output values is attributable to the waste received from the Plan Area or from waste received from elsewhere. Also, differences between inputs and outputs at a single site may be due to on-site stockpiling of materials across the year, rather than activity resulting in waste being processed into a non-waste material. However, to ignore these inputs entirely would be to miss a significant amount of waste managed through the permitted system, some of which is produced in the Plan Area. Movements of waste to Plan Area intermediate facilities can be discounted on the assumption that all materials going through such sites ended up in an outlet that would be counted elsewhere as waste arising in the Plan Area. For example, residues will go on to landfill and will appear in WDI data, hardcore going for crushing is captured by recycled aggregate production data, soil going to formerly exempt sites is captured, heavy recyclables such as wood and metal appear under WDI entries too. Therefore because of the above, no entry is made for waste inputs to intermediate sites located within the Plan Area. That leaves CDEW exported from the Plan Area to intermediate sites outside the Plan Area only. This gives a value of 28,816 tonnes.	28,816
2	**Waste sent to landfill sites**	CD&E waste known to be sent to landfill	The value reported in the WDI for CDEW input to landfill in 2014 is used which is 442,113 tonnes. This covers disposals direct to landfill and those from intermediate sites within Oxon	442,113
3		CD&E waste sent from intermediate sites in the Plan Area to landfill	Including movements from Plan Area intermediate sites to landfill runs the risk of double counting as the value for inputs going to landfill from the Plan Area will already include that from Plan Area intermediate sites. However, that risk only occurs where outputs from the Plan Area intermediate sites are classed under waste codes counted as CDEW. Residue from the intermediate sites classed as residue from mechanical treatment is normally coded as 19 12 12 -. If these outputs are ignored it runs the risk of underestimating arisings due to recoding at the	15,211

			intermediate site following processing. Therefore, to avoid this loss and gain a comprehensive picture of CDEW managed, the following method was adopted. The total of quantity of this waste type (19 12 12) produced by Plan Area sites taking CDEW in 2014 was ascertained as 89,408 tonnes. To estimate the element of this attributable to the Plan Area it was apportioned according to the origin of the inputs. 39% of inputs to the intermediate sites shown as receiving CDEW and producing 191212 that went to Landfill came from the Plan Area. Applying that to the total production gives the value 35,215 tonnes. To account for non-CDEW inputs that contribute to the tonnage of waste classed as 19 12 12 the value used in the C&I estimate was apportioned to the landfill only element giving the value entered.	
4	**Waste managed at formerly exempt sites**		Post-2010 the range of activities exempt from permitting was revised with thresholds on activity introduced above which a permit is required. The WDI data shows how inputs to formerly exempt sites are now captured in the formal reporting system and how this largely compensates for the 'leakage' from the formal system that was observed before 2010. 2014 WDI value records this waste now managed at permitted facilities as 136.633tonnes. This captures amongst other activities golf courses construction, use of soil for recovery	136,633
5	**Waste recycled as product**		While a value generated by the Minerals Product Association is used in the national methodology, further investigation has revealed that this is founded upon the DCLG survey of 2005 and 2008 rather than direct survey of MPA members. Since that dataset is now approaching a decade in age (originally 2004 updated to 2008) it is determined not to be reliable. Therefore, the value applied for recycled aggregate in the LAA (337,000 tonnes) has been used. plus screening of soil from the WDI (73,662 tonnes).	410,662
			Total	**1.03 mtpa**

3.6.3 Calculating a Revised Baseline

Table 30: 2014 CDEW Baseline Arisings Cumulative Totals

Element	2014 Cumulative Total
Waste dealt with by intermediate facilities	28,816
Plus Waste sent to landfill sites (CDEW plus 191212)	486,140
Waste managed at formerly exempt sites	622,773
Waste recycled as aggregate (LAA data plus WDI soil screening)	**1,033,435**

3.6.4 Preliminary Conclusion

The 'as managed' value obtained is some 325,000 tonnes lower than the 'point of production' value generated by BPP in 2012 (1.36mtpa). That represents a drop of 24%. A drop is to be expected with a switch in approach as some waste such as demolition will largely be managed on the site of production. In fact, if the demolition recycling element of the original estimate of 492,000 tonnes that might be managed on-site calculated to be 272,000 tonnes (492,000x55%) is disregarded, the totals are reasonably similar (1.07mtpa vs 1.03 mtpa).

How this indicated reduction relates to actual development (house building plus) and demolition activity is not clear but further comparative analysis may reveal some insights.

3.6.5 'Managed waste' baseline estimate vs ‘point of production’ arising estimate

An 'as managed' waste baseline focuses attention on that element of the waste stream most likely to require specific provision of management capacity for the future. 'As managed' should in theory be easier to generate relying on established datasets, but can as with C&I only be relied upon to the extent that the datasets relied on accurately represent management flows. If the WDI is not capturing all flows then reliance on it runs the risk of under estimating and, in due course, under-providing. In addition there is a substantial reliance on estimates for recycled material (aggregate and screened soil) production, which may not be captured by the WDI at all - although should ideally be reported through the annual Local Aggregate Assessment.

Considerable reliance of demolition waste management in particular is placed upon onsite crushing and on-site incorporation of the material into developments, and while this continues the need for off-site facilities for the management of this waste is avoided. The continuation of these activities might, however, be adversely affected by:

- the need to mitigate against flood risk constricting the ability to incorporate fill in development site landscaping so as to not compromise flood plains, and;
- the closer proximity of development to existing sensitive noise receptors might constrain the use of crushers on development sites.

Either or both of these might drive a greater need for offsite management arrangements. Similarly a tighter interpretation of permitting requirements by the Environment Agency of land recountouring schemes may restrict the use of waste and force inert material into permitted sites such as landfill.

3.6.6 Comparing the output of the preferred estimate approach against the approaches taken by other Waste Planning Authorities.

The following table summarises the approaches taken

Table 31: 5 Comparator WPA approaches to estimating CDEW baseline

WPA	Method	Value (m tpa)	Baseline Year	Comment
Devon	National estimates apportioned down using DCLG surveys & then Plan Area	1.2	2010	Defra CDEW estimates for 2008, 2009 and 2010 considered to represent the most up to date, but
Suffolk	None - only inert waste inputs to landfill accounted for	0.4	2008/9	Not clear where financial year data for landfill inputs sourced from as WDI is by calender year
Cambridgeshire	Data from the Environment Agency" Probably from SWMA	2.6	2006	Not clear whether source relates to 'as managed' and if so if just licensed site inputs (2006 is pre WDI) or
Warwickshire	Apportionment of regional study values	0.907	2010/11	C&D waste is extremely difficult to calculate and monitor.
Buckinghamshire	Not specified	1.03	2009/10	

Assessment: The methods selected are less than transparent in all but the case of Devon. The Devon estimate is open to some criticism as it applies WDI inputs as representing a proxy for total arisings i.e. an 'as managed' proportion, to a 'point of production' national estimate. In reality few WPAs are applying the national 'as managed' methodology at present meaning there is little basis for direct comparison.

A suggested means of testing the representativeness of the values arrived at (and hence of methods applied) is to:

1. compare the values obtained with that obtained for Oxfordshire (1.03mtpa) to assess the % difference between them; and then
2. compare the % difference between these values with the % difference between data for construction activity in each of the Plan Areas. In this case the 4-year average of construction orders for 2009-2012 has been used as a proxy for activity with the % contribution of the national total each WPA plan area accounts for.

This yields the results shown in Table 32.

Table 32: Comparison between Comparator WPA CDEW baseline estimates and Construction Order value

	Arising Estimate (m tpa)	4yr av % national order value
Cambs	2.6	1.93%
Devon	1.2	1.78%
Oxon	1.03	1.70%
Bucks	1.03	1.35%
Warks	0.907	1.00%
Suffolk	0.4	1.36%

The above comparison suggests there is some correlation between the arisings estimates and construction activity.
To summarise:

- Both Cambridgeshire and Devon have higher estimates of arisings and accounted for a greater proportion of construction orders; while
- Warwickshire has a lower estimate of arisings and also accounted for a smaller proportion of construction orders;
- Suffolk has a lower estimate of arisings and also accounted for a smaller proportion of construction orders. However as stated previously the value generated for Suffolk is considered to significantly underestimate arisings for the stream as a whole as it is only based on inert waste sent to landfill so this value should be treated with some caution.
- Buckinghamshire is the only WPA that 'bucks the trend' as it has a similar estimate but accounted for a smaller proportion of orders

3.6.7 CDE Waste Landfill Diversion Targets

Assessment: The withdrawn Oxfordshire Minerals & Waste Core Strategy proposed submission document May 2012 proposed the following targets for Construction, Demolition and Excavation waste:

Table 33: Original Proposed CDEW Targets

	2015	2020	2025	2030
Recycling	50%	60%	60%	60%
Landfill/Restoration	50%	40%	40%	40%

BPP Consulting in its report 10.02.14 made the following assessment:

"The data review indicates that at least 53% of Oxfordshire CDEW arisings is either recycled or reprocessed into a product. This leaves 24% of CDEW being either subject to a recovery process which in the case of CDEW could include:

- being further processed at a CDEW MRF to extract materials for recycling,
- thermal treatment for energy production (combustible element)
- utilisation in onsite construction and engineering ,
- use in offsite activities either at exempt or permitted landfill sites.

The remaining 23% is considered to go to landfill which may include the backfilling of mineral voids.
This profile suggests that the current targets proposed are quite unambitious and that this stream in particular offers greater opportunity to move waste up the hierarchy through conversion to product."

It then went on to state:
" Bearing this in mind it is considered that the following targets should be adopted.

Table 34: Proposed Amended CDEW Targets

	2010	2015	2020	2025	2030
Recycling, Use or Conversion to Product	54%	55%	60%	65%	70%
Recovery	24%	25%	25%	25%	25%
Landfill/Restoration	22%	20%	15%	10%	5%

To promote movement of waste management up the waste hierarchy, ultimately more material needs to be converted to products which replace primary materials, with only the minimum amount of material - such as clays and hazardous materials such as asbestos – continuing to be landfilled. "

It should be noted that the 70% target included the production of aggregate from demolition materials, much of which are processed on the site of production and hence fall outwith the 'as managed' estimation method. Applying an 'as managed' approach means that the benefit of the very high recycling rates achieved by the sector cannot be relied upon to boost achievement of targets. Hence the adoption of

less ambitious ones - while demolition sector recycling continues unmeasured - may be advisable.

The OCC Proposed Submission Core Strategy August 2015 proposed an additional reduction in landfilling of CDEW in 2016 such that the following profile is achieved:

Table 35: Proposed CDEW Landfill diversion Target Proposed in OCC Submission Core Strategy August 2015

	2016	2021	2026	2031
Landfill	45	40	40	40
Implied Landfill diversion	55	60	60	60

The profile proposed in the Core Strategy is shown below with a moderate increase in recycling, which would be primarily achieved through recycled aggregate production. Based on data supplied by OCC as reported in the LAA, this method of management currently only accounts for between 33%-39% (inc soil) of arisings when measured at the 'point of management', so to achieve the 55% would involve a substantial jump if the contribution of on-site recycling particularly made by the demolition sector were to be ignored.

Table 36: CDEW Recycling Target Proposed in OCC Submission Core Strategy August 2015

	2016	2021	2026	2031
Recycling	55	60	60	60

These targets still appear to be quite unambitious by comparison with the targets adopted by the 5 comparator WPAs in Table 37. But it is noted that they are intended to include "waste disposed as part of a recovery operation."(footnote to the table in policy W2) We understand this is intended to capture legitimate recovery operations such as landscaping along with the use of inert waste for backfilling and restoration and that it is framed as 'waste disposal' because of the practical difficulty of distinguishing between deposits of inert waste for restoration as recovery or disposal. In this context the national policy approach to the waste hierarchy, prescribed in the National Waste Management Plan 2013, classes the use of certain inert waste for backfilling mineral working as 'other recovery' on a par with anaerobic digestion and thermal treatment, it being an activity that is specifically excluded from the national target for recycling/landfill diversion of CDEW introduced by the revised Waste Framework Directive. The National Waste Management Plan 2013 also states that "…the disposal of inert waste in or on land i.e. landfill, remains a valid way of restoring quarries and worn out mineral workings where this is a planning requirement.“ It is not clear whether the stated "waste disposed as part of a recovery operation." is intended to capture both possible operations i.e. use of inert waste as recovery and disposal of waste for restoration or what otherwise might be referred to as 'the permanent deposit of waste'.

3.6.8 Comparison of Preferred Targets with those set by up to 5 comparable Waste Planning Authorities

Table 37: Comparator WPA targets for CDE waste

Authority		Milestone Year			
	Target Type	2016	2021	2026	2031
Devon County Council	Recycling (inc aggregate)	88	89	89	90
Suffolk County Council	Recycling (inc aggregate)	not specified	not specified	not specified	not specified
Cambridgeshire County Counc	Recycling (inc aggregate)	65	70	70	
Warwickshire County Council	Recovery		70	70	
Buckinghamshire County Cour	Recycling (inc aggregate)	50	60	60	
	All Recovery	86	88	90	

3.7 LACW Baseline Update

3.7.1 Historical MSW Arisings

Figure 7 plots the data for MSW (or LACW) arising within Oxfordshire. Analysis of the trend in municipal solid waste arisings between 2001/02 and 2014/15 suggests that the trend remains towards decline. This is shown by the trend line in Figure 7 below. However the overall Compound Annual Growth rate has moved from negative 0.11% to positive 0.03% for the period, reflecting the fact that recent values has seen a reverse of the decline observed in the period 2007/8 to 2011/12:

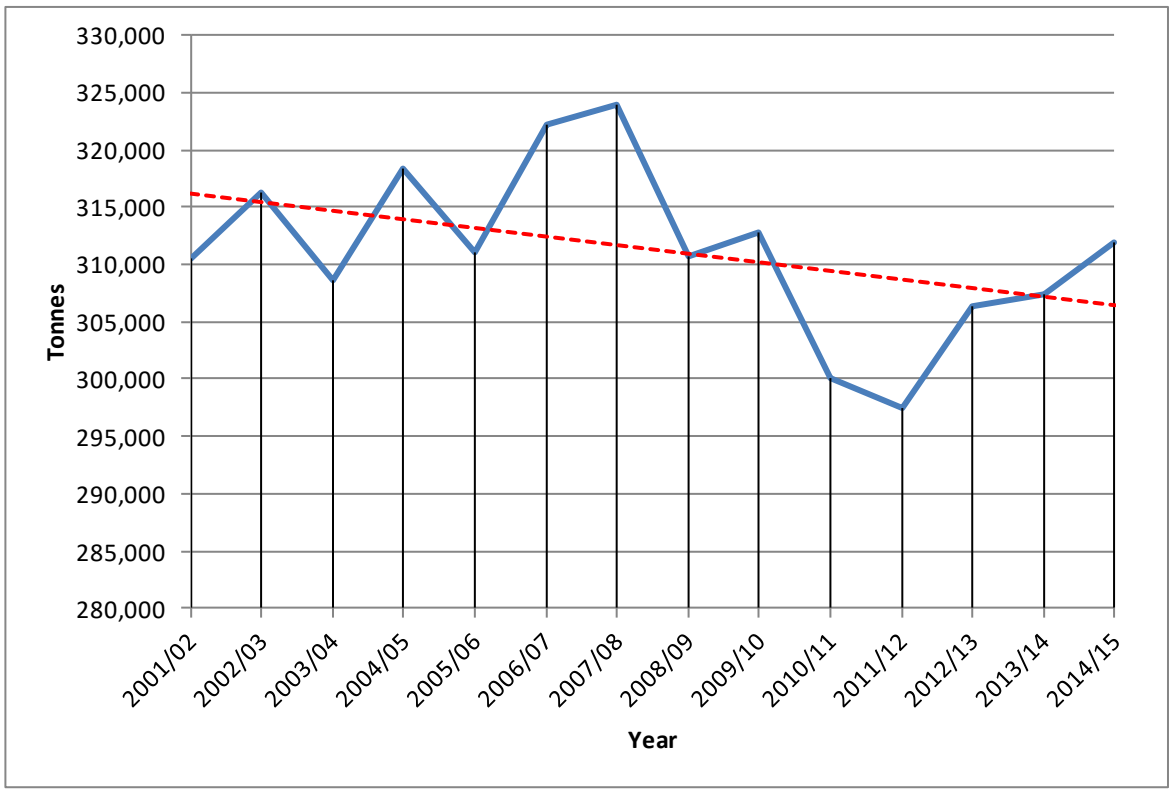


Figure 7: Trend in MSW Arisings 2001/02 to 2014/15

(*dashed red line is trend line.).*

3.7.2 Future Household Waste Growth Prediction

The expectations of the OWP regarding future growth in household waste is set out in paragraph 9.2 of the Oxfordshire Joint Municipal Waste Management Strategy 2013; this states:

"*Early indications are that after several years of continual waste reduction, we will see a small rise in waste arisings in 2012/13.* ***From this point forward we have predicted 0% growth per household, but with overall waste levels increasing due to growth in the number of houses within the county***."

Achievement of 0% waste growth per household from 2012/13 is reflected in policy 3 of the Strategy as follows: "Oxfordshire Waste Partnership will help households and individuals to reduce and manage their waste in order to ensure zero growth or better of municipal waste per person per annum."

Figure 8 compares the JMWMS forecast with actual values showing that the forecast quite closely reflects the current position.

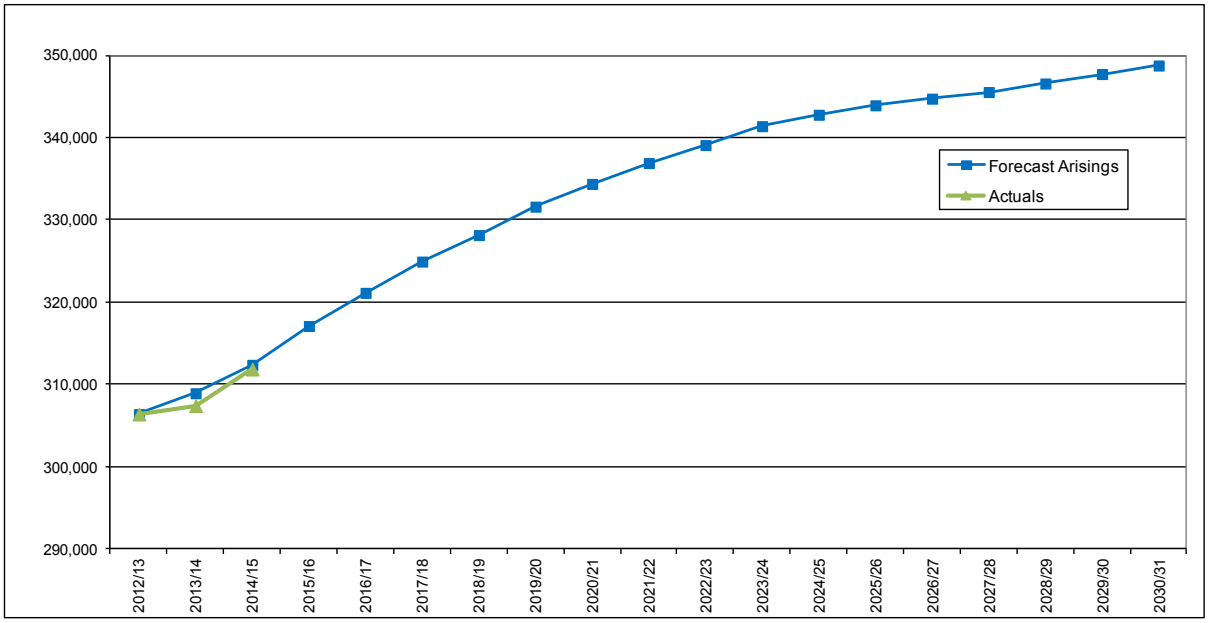


Figure 8: Actuals data vs JMWMS forecast for LACW

Figure 9 compares the implied trend from the JMWMS forecast with the trend from the actual values. This suggests that the JMWMS forecast predicts a higher than actual growth rate for the first part of the Plan period but then the rates converge in the latter period towards a value in excess of 350,000 tpa - which is the limit of the JMWMS forecast. If the actuals trend proves to be more reliable than the forecast it suggests that capacity provision might be reduced somewhat in the first half of the plan period without compromising the plan's objectives.

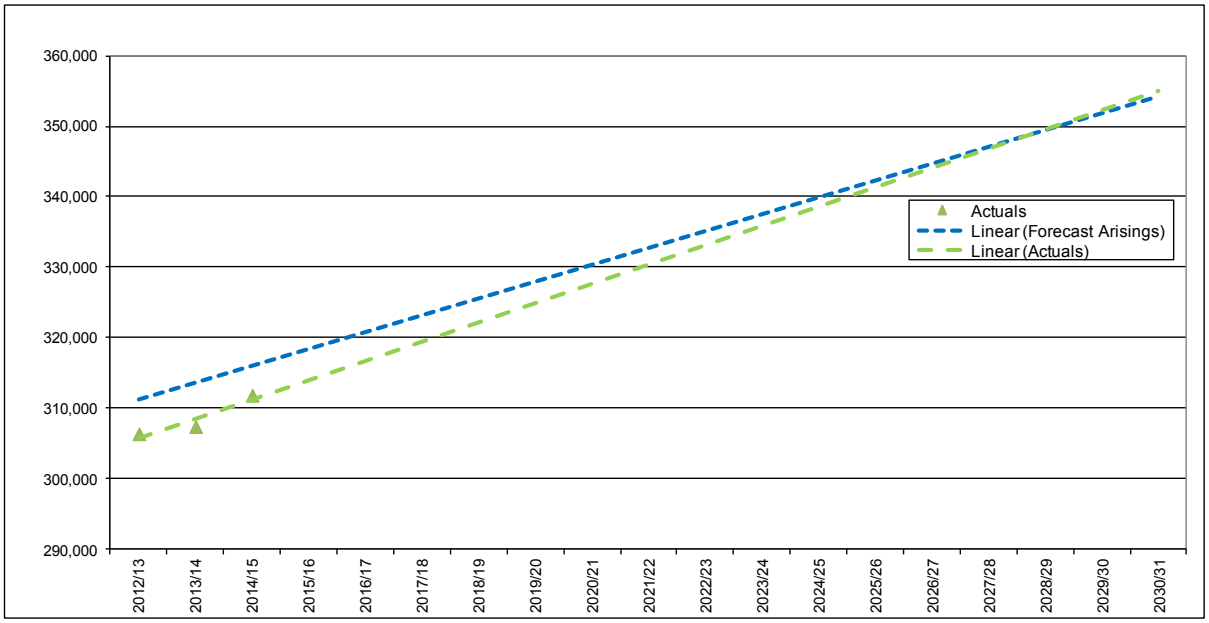


Figure 9: Implied trend lines arising from actuals data vs JMWMS forecast for LACW

4 Cross Boundary Movement of Waste

The data in this section has been updated using 2014 figures from the EA WDI 2014 and 2014 Incineration data. This reveals the profile show in Table 38 below.

Table 38: Origin of waste managed at Oxfordshire facilities 2014

	Oxfordshire		Other Areas		Total
	Tonnes	%	Tonnes	%	
2014	2,044,642		878,508	30	2,923,150

When compared with data for previous years shown in Table 22 of the WNA this shows that:

1. The total quantity of waste managed at Oxfordshire facilities has increased from 1.9 mt in 2013 to 2.9 mt in 2014.
2. The quantity of Oxfordshire waste managed at these facilities has increased from 1.2 mt to 2.0mt.
3. The quantity of out of Plan Area waste managed at these facilities has increased from 0.67 mt to 0.88 mt, even though the % that out of plan area waste represented of the total has fallen from 35% to 30%.

This indicates that Oxfordshire has made significant strides in providing additional capacity and is making an ever-increasing contribution to the management of out of plan area waste.

The facility type breakdown is shown in Table 39 below.

Table 39: Flows balance for Oxfordshire Waste going to permitted sites 2014 (tonnes)

Source: EA WDI & Incineration dataset

	Landfill	MRS	On/In Land	Transfer	Treatment	Use of Waste	EfW/Incin	Total
Oxon to Oxon	570,192	17,236	98,666	229,902	1,060,295	6,726	61,625	**2,044,642**
Oxon to Elsewhere	-62,701	-34,826	-24,099	-59,781	-202,719	-10,695	-1,123	**-395,944**
Elsewhere to Oxon	473,808	16,077	17,303	97,323	192,031	3,798	78,170	**878,508**
Net Balance	**981,299**	**-1,514**	**91,870**	**267,443**	**1,049,607**	**-172**	**138,672**	**2,527,206**

The flows balance is illustrated in Figure 10 below.

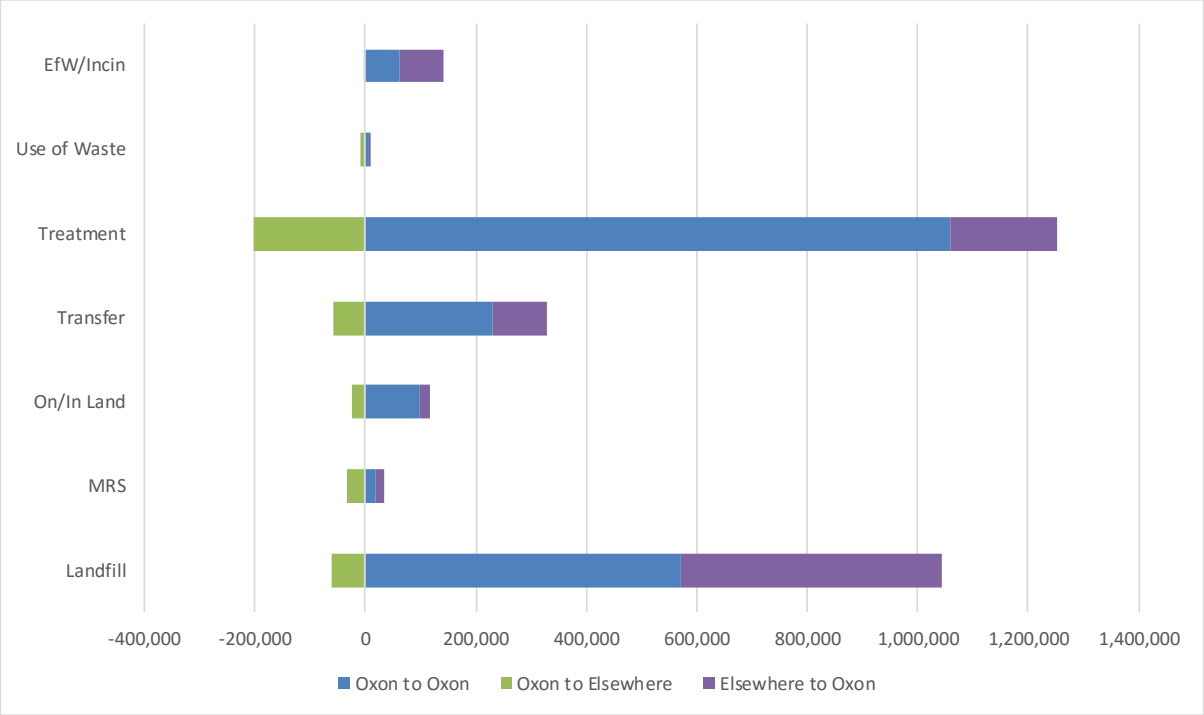


Figure 10: Flows balance for Oxfordshire 2014

Source: EA WDI 2014 plus EA Incineration Data

The profile confirms that not only is Oxfordshire net self sufficient by a significant margin but it is also a net importer of waste. If the capacity used to manage waste in 2014 continues to be available throughout the Plan period then Oxfordshire could export up to 2.5 million tonnes per annum and still maintain net self-sufficiency. Hence it would not be necessary for Oxfordshire to provide additional capacity purely to meet the Plan objective of net self-sufficiency.

The questions that remain are:

1. what type of capacity is being provided by Oxfordshire; and
2. what type of capacity is currently utilised and available to manage Oxfordshire's waste outside the Plan Area.

In particular will it contribute towards meeting targets of the Plan in particular and the general objective of driving waste up the hierarchy where possible.

This question has to be considered within the reality of the waste management capacity market. This combined with the general presumption against the imposition of conditions to restrict inputs to specific catchments such as the plan area, means the plan has little or no control over which waste actually gets managed through a facility once it is built.

4.1.1 Energy Recovery Capacity

The 2014 data shows that of the 139,000 tonnes of capacity provided in Oxfordshire - principally Ardley Energy from Waste plant - 56% of inputs came from outside the county. Bearing in mind that 2014 was a commissioning year and the actual annual capacity when fully operational is circa 300,000 tpa, and the contracted annual tonnage of LACW leaves a substantial headroom for waste either from outside the county or from the plan area C&I waste stream, or a combination of both. Since the capacity is available for the operator Viridor to 'sell' and there is no catchment restriction on the plant, reception of imports could continue indefinitely. If the commercial realities were to change and Plan Area C&I was managed through the plant instead of imports then the plan area's ability to meet landfill diversion targets would be improved whilst its net self -sufficiency would remain unaltered.

5 Waste Management Capacity

5.1 Maximum Capacity vs Actual Capacity

The validity of the argument of the difference between the two must be based on an assessment of actual inputs to sites. The most reliable source of information relating to this is the Environment Agency WDI - providing the site is permitted and reporting.

A comprehensive methodology was developed by OCC where data relating to the historical performance of each site drawn from the WDI was considered against limits imposed both through the environmental permit and through the planning consent where such a limit exists. Operational restrictions were also considered.

Where a theoretical limit had been met or exceeded this would confirm that the limit itself is a reasonable figure to use providing other things remain equal on the site. By way of example in the case of two sites operated by Sheehan both site inputs limits applied in the WNA were exceeded when compared to the WDI 2014 input data as shown in Table 40 below. This confirms the values used in the WNA are reasonable.

Table 40: Example Comparison between WNA & WDI input values

Site	WNA Table	WNA Value (tpa)	WDI 2014 (tpa)
Slape Hill Quarry	A12/4	20,000	24,322
Dix Pit Complex	A12/7	98,000	99,510

Where inputs fall below the theoretical limits this may be due to a number of factors. In the case of recycling facilities it is often limited by the availability of material. This was a point made numerous times during the survey of operators of recycled aggregate facilities[12]. ie they could produce more given the supply of feedstock.

The introduction of targets in the Plan promoting the management of waste further up the hierarchy, combined with targets constraining the management of waste through methods lower down the hierarchy, can assist in making materials available to the market. However history shows that the actual response of the market can be very different to that predicted. For example in the case of recycled materials, materials may simply travel further to regional 'super MRFs' resulting in local MRF capacity becoming unviable. Similarly where the Plan can exercise little control, whether it be through the unconstrained availability of capacity already consented such as landfill in Oxfordshire, or where capacity consented is not subject to catchment restrictions, waste can simply flow from elsewhere to fill the capacity resulting in waste that a Plan seeks to divert from landfill continuing to be landfilled. The Ardley ERF discussed earlier is a case in point.

[12] See Appendix 2 of the BPP 2014 Report on CDEW