environmental services association

UK Residual Waste: 2030 Market Review

Final

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Written By:

TOLVIK CONSULTING

The Environmental Services Association has engaged Tolvik Consulting to undertake an independent review of third party reports and analysis relating to the Residual Waste market in the UK in order to:

- Identify areas of "**common ground**" between the different reports and analysis;
- Identify **differences in methodology** between the reports and, where possible, both identify the reasons for these differences and, critically, the impact of the differences upon the overall assessment of the market;
- Develop a set of forward looking **assumptions** to drive future projections of the market.

ABOUT THE ENVIRONMENTAL SERVICES ASSOCIATION

The Environmental Services Association ("ESA") is the trade association representing the UK's resource and waste management industry. ESA's work helps enable its members to turn Britain's waste into valuable resources whilst protecting the environment. ESA engages with all levels of government, regulators and the public to help deliver a more sustainable waste and resource management solution for the UK.

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Disclaimer

This review has been prepared by Tolvik Consulting Ltd on an independent basis using its knowledge of the current UK waste market and with reference inter alia to various published reports and studies and to its own in-house analysis. This knowledge has been built up over time and in the context of its prior work in the waste industry. This review has been prepared by Tolvik Consulting Ltd with all reasonable skill, care and diligence as applicable and Tolvik Consulting does not warrant the accuracy of information provided. Whilst all reasonable precautions have been taken to check the accuracy of information contained herein, Tolvik Consulting Ltd shall not be responsible for the consequences (whether direct or indirect) of any decisions arising from this review.

EXECUTIVE SUMMARY

- Tolvik has been commissioned by the ESA to undertake an independent review of third party reports and analysis relating to the Residual Waste market in the UK. The review follows the recent publication of a number of reports which suggest a potential "under-capacity" in the Residual Waste treatment market in 2030 of 10.4Mt through to an "over-capacity" of 9.5Mt.
- The basis upon which the six reviewed reports were prepared varies greatly, as does the purpose for which they were designed. There is therefore limited benefit in directly comparing the headline findings in each report. Instead, this review seeks to identify areas of common ground, differences in methodology and to use the reports to help develop a series of forward looking assumptions.
- The focus of the reports and this review is upon Residual Municipal Waste – being Residual Waste which can be treated alongside residual Household Waste. Estimates in the reports of the tonnage of Residual Waste in 2016, the baseline year for the analysis, range from 26.0Mt to 27.9Mt.
- Following an analysis of the detail underpinning the 2016 figures in the reports, the review has assumed a 2016 baseline of **27.1Mt** of Residual Waste in the UK with a margin of error of c. +/- 2.0Mt.
- Across the six reports the projected tonnage of Residual Waste in 2030 varies greatly, ranging from a low of 13.5Mt to a high of 31.7Mt. The variations between the projections are primarily a consequence of differences in the recycling rates assumed in 2030.
- A simplified Tonnage Model has been developed in support of this review based on six key assumptions. Where possible, the Tonnage Model has been used to replicate the projected Residual Waste tonnages in the reports in 2030 to within a 5% margin.
- In the absence of long term waste policy, particularly in England, the Tonnage Model has then been used to develop five scenarios. These range from a No Change scenario (in which recycling rates, as currently measured, do not rise) to a High Recycling scenario which assumes a 65% recycling rate for Household Waste and a 78% recycling rate for municipal-like C&I Waste.

Scenario	2030 UK Recycling Rate			2030 Residual Waste (Mt)
	Household Waste	Municipal C&I Waste	Combined	
No Change	44%	61%	52%	29.5
50% Household	50%	63%	57%	26.8
55% Household	55%	65%	60%	24.5
CE Target	60%	70%	65%	21.0
High Recycling	65%	78%	71%	17.3

Figure E1: UK 2030 Residual Waste Projections

- Using the analysis in the reports, the review then considers the capacity for the treatment of Residual Waste in 2030. It estimates capacity in the UK which is currently operational or in construction to total 16.6Mt - being 14.5Mt of dedicated EfW capacity, 1.3Mt of cement kiln/IED biomass capacity and 0.8Mt representing the net impact of Mechanical Biological Treatment.
- On this basis, it is projected that in 2030 in the No Change scenario there will be a "gap" in Residual Waste treatment capacity of **13.0Mt,** whilst in the High Recycling scenario, by 2030 Residual Waste treatment capacity is projected to be 16.6Mt - just **0.7Mt** short of the tonnage of Residual Waste. In this scenario, the construction of Additional EfW capacity in the UK would therefore result in over-capacity. In the 55% Household scenario the projected "gap" is **8.0Mt.**

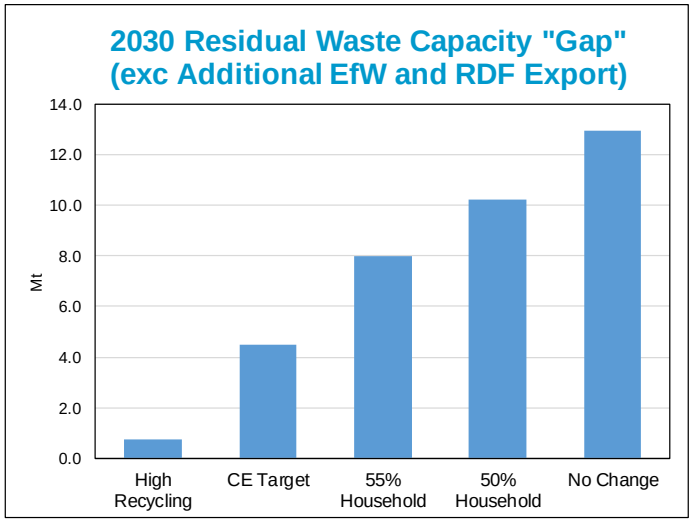

Figure E2: Projected UK 2030 Residual Waste Gap – excluding Additional EfW and RDF exports

- Five of the reports identify that, on the balance of probabilities, c.2.0Mtpa of Additional dedicated EfW capacity will also be constructed in the UK before 2022. When this is combined with a projected 2.5Mtpa of RDF exports in 2030 (the median figure from the estimates included in the reports), in the 55% Household scenario the 2030 capacity "gap" reduces to **3.5Mt.** In the High Recycling scenario the analysis suggests an overcapacity of **3.8Mt** whilst in the No Change scenario the "gap" would be as high as **8.4Mt**.

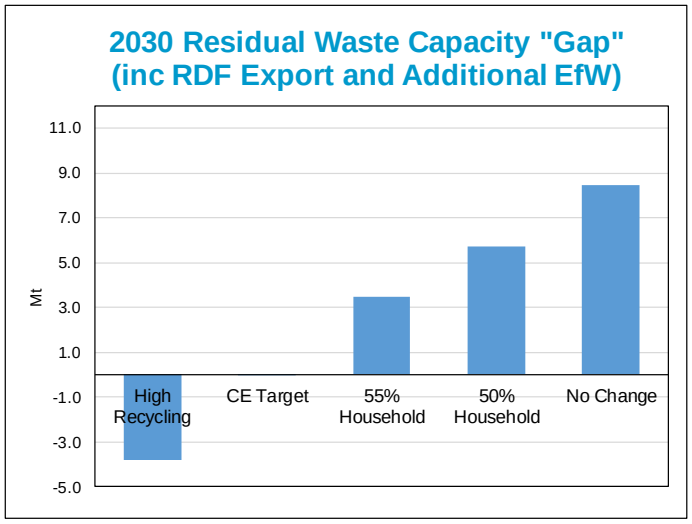

Figure E3: Projected UK 2030 Residual Waste Gap – including Additional EfW and RDF exports

- The modelling suggests that, notwithstanding the role landfill has to play in the future management of those wastes for which there is no alternative treatment, it will have a key role to play in providing the "balancing" capacity in the Residual Waste market through to 2030. For example, in the 55% Household scenario it is estimated that 69Mt of Residual Waste would need to be landfilled between 2018 and 2030.
- The review demonstrates the specific sensitivity of market projections to recycling assumptions. The current policy uncertainty, particularly for England, consequently increases the risk of a mismatch between Residual Waste tonnages and available treatment/disposal capacity. Such policy uncertainty may also serve to discourage capital investment into the sector, whether for infrastructure in support of recycling or for the treatment of Residual Waste.
- There are also a number of areas which were "out of scope" but which have the potential to impact on the findings of this review and which would benefit from further analysis/discussion.

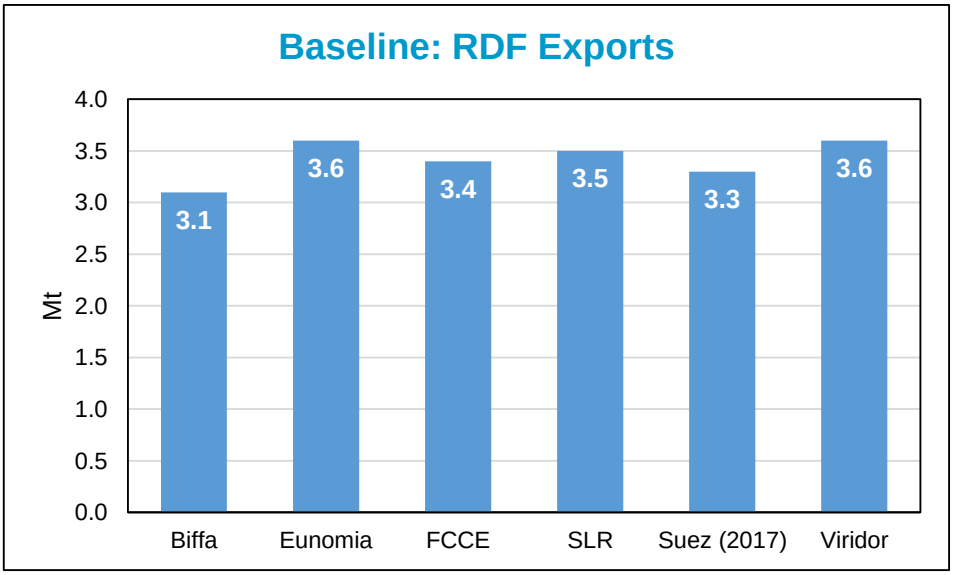

Figure 10: RDF Exports Sources: Reports

	Data Source	2016 ktpa
England	*Eunomia FoI request to EA*	3,353
Wales	*Estimated*	c.50
Scotland	*SEPA FoI - Mid June 2016*[x]	c.70
N Ireland	*NIEA*[xi]	143
Total RDF Export		**3,616**

Figure 11: Estimates of RDF Exports Sources: As shown

3.6. 2016 Facility Inputs: Landfill

3.6.1. The Reports

Figure 12 shows the estimated tonnages of Residual Waste (as defined in this review) to landfill in 2016. These vary in the reports (recognising, as discussed in Section 3.3, the different Eunomia methodology) between 8.9Mt and 13.6Mt. The tonnage of all waste sent to landfill in the UK was significantly higher, with 44.7Mt being sent to landfill in England alone in 2016[xii].

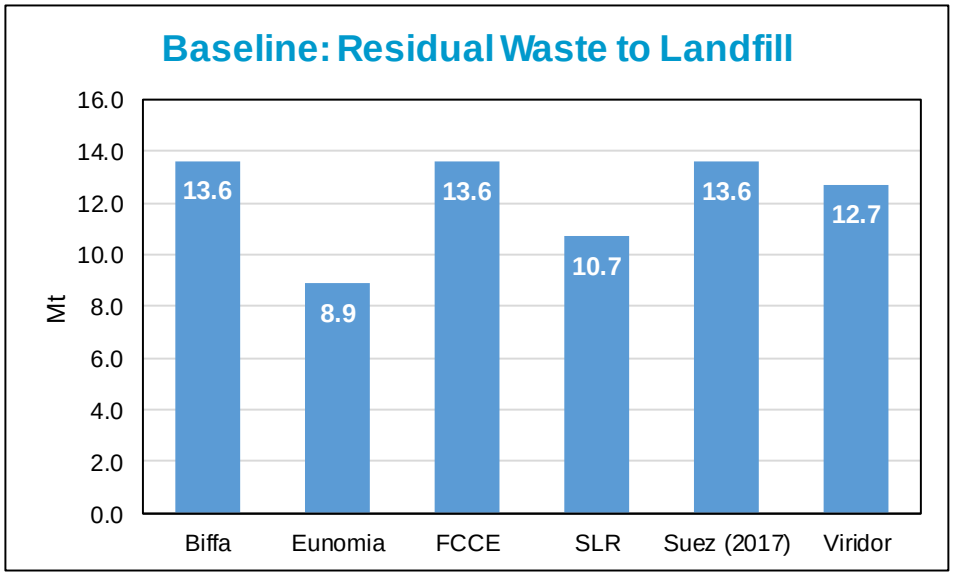

Figure 12: Residual Waste to Landfill Source: Reports (NB Viridor adjusted for N Ireland)

In theory it should be relatively easy to assess the tonnage of Residual Waste sent to landfill in 2016. However, it is widely acknowledged that there are significant differences in the tonnages reported by operators in their quarterly site returns to the regulators (EA, SEPA, NRW and NIEA), DEFRA assessments of Municipal Residual Waste sent to landfill (as part of its reporting requirements under the EU Landfill Directive) and the combined landfill tax data from HMRC and Revenue Scotland.

In 2015 (at the time of this review, the last year for which data is fully available) the variation between assessments based on the different data sources was c.4.9Mt (ranging from 10.4Mt to 15.3Mt).

Basis for Estimate	Household, Commercial and Industrial ("HIC")	Municipal Residual Waste	All Standard Rate Landfill Tax (All)	Standard Rate Landfill Tax (exc Hazardous)	Standard Rate – Municipal Waste only
Ref	**A**	**B**	**C**	**D**	**E**
Source/ Calculation	*Estimated from England + Scotland EA/SEPA data*	*DEFRA Landfill Directive Return*	*HMRC/ Revenue Scotland*	*C – Hazardous Tonnages*	*D x B/A*
2014	20.7	**18.2**	15.5	14.6	**12.8**
2015	18.6	**15.3**	13.7	12.7	**10.4**
2016	17.8	***15.0 (est)***	12.1	11.3	**9.2**

Figure 13: Estimates of Residual Waste to landfill Sources: As shown

Landfill Tax data provides the lowest figure and there is little doubt that this sets an absolute "floor" to potential tonnages of Residual Waste sent to landfill. This is estimated in Figure 13 to be circa 9.2Mt. This is broadly consistent with Eunomia's analysis:

"The UK landfilled around 11 million tonnes of waste at the standard rate of landfill tax last year, but probably no more than nine million tonnes would be suitable or available for treatment by incineration."

However, HMRC have estimated[xiii] in 2014-15 that for landfill tax there was a "tax gap" of 12% - suggesting that landfill tax potentially under-estimates the tonnages of Residual Waste to landfill. 360 Environmental[xiv] have noted that in 2016 there is some evidence to suggest that the gap had widened. Assuming for simplicity that the 12% avoidance applied equally across all tax bands, then it could be argued that the "floor" in Figure 13 of 9.2Mt for 2016 would rise to **10.5Mt**.

The issue can also be considered on a "top down" basis. DEFRA reported that in 2015 15.3Mt of (Residual) Municipal Waste was landfilled. However, this potentially over-estimates the tonnage of Municipal Waste to landfill.

Separate analysis of publicly available data suggests that (with the probable exception of Scotland), the DEFRA figure includes all waste to landfill coded under the European Waste Catalogue as 19 12 12. In fact, a review of waste treatment facilities in England producing 19 12 12 reveals that this code is being used for a range of different outputs, some of which are almost certainly inert and fall within the lower landfill tax band (and so not suitable for treatment alongside Household Waste). Analysis of all sites in England would suggest that at least 65% of 19 12 12 was derived from active waste inputs. Further analysis is contained in Appendix 1.

Across the UK as a whole in 2016 it is estimated that around 8.8Mt of 19 12 12 was produced and sent to landfill of which it is therefore estimated circa 2.8Mt was inert-derived. This would suggest that the total tonnage of Residual Waste sent to landfill in 2016 was 15.3Mt less 2.8Mt, i.e. **12.2Mt.** If instead it is assumed that c.80% of 19 12 12 was active waste, then the total tonnage of Residual Waste to landfill in 2016 is estimated to have been **13.6Mt**.

On balance this review assumes a figure of 12.2Mt.

APPENDIX 1 – DATA TABLES

2016 Residual Waste Inputs into Cement Kilns

Facility	19 02 10	19 12 10	19 12 12	Total ktpa
Cauldon		12		12
Hope		14		14
Ketton	1	1	50	51
Ribblesdale		27	2	28
Rugby	45	127		172
South Ferriby	24			24
Tunstead		17		17
Aberthaw (Est)		15		15
Padeswood (2015)		32		32
Grand Total	**70**	**245**	**52**	**366**

Figure A1: Estimates of Residual Waste to UK Cement Kilns in 2016 Sources: WDI 2016, Tolvik data

19 12 12 Impact on Landfill Tonnages

Mt	All HIC (Estimate)	Municipal Waste (Estimate)	Adjust for 19 12 12	Residual Waste
England	14.4	12.2	2.6	9.5
NI	0.6	0.5	0.1	0.4
Scotland	2.2	1.9	0.0	1.9
Wales	0.5	0.5	0.1	0.4
Total	**17.8**	**15.0**	**2.8**	**12.2**

Figure A2: Estimates of Residual Waste to landfill Source: EA, SEPA, Tolvik analysis

Assumed 2016 Household Waste

Region	Arisings (Mt)	Residual Waste (Mt)
England	23.5	13.4
Scotland	2.5	1.3
Wales	1.4	0.6
Northern Ireland	0.9	0.5
UK Total	**28.2**	**15.9**

Figure A3: Household Waste Baseline Data for 2016 Source: Tolvik estimates from DEFRA/SEPA/StatsWales/NIEA

APPENDIX 2 – SOURCE REFERENCES

i https://www.gov.uk/government/publications/energy-from-waste-a-guide-to-the-debate

ii https://www.google.co.uk/search?source=hp&q=CIWM+Report+2013+%E2%80%93+Commercial+and+Industrial+Waste+in+the+UK+and+Republic+of+Ireland&oq=CIWM+Report+2013+%E2%80%93+Commercial+and+Industrial+Waste+in+the+UK+and+Republic+of+Ireland&gs_l=psy-ab.3...2521.2521.0.3805.4.3.0.0.0.0.71.71.1.3.0....0...1.2.64.psy-ab..1.0.0.0...73.sMcUwB2UOe4#

iii https://www.imperial.ac.uk/environmental-policy/research/environmental-quality-theme/current-projects/veolia-partnership/infraneedsproj/

iv http://greeninvestmentgroup.com/media/25376/gib-residual-waste-report-july-2014-final.pdf

v https://www.gov.uk/government/publications/forecasting-2020-waste-arisings-and-treatment-capacity

vi https://data.gov.uk/dataset/waste-data-interrogator-2016

vii http://www.tolvik.com/wp-content/uploads/UK-EfW-Statistics-2016-report-Tolvik-June-2017.pdf

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x http://apps.sepa.org.uk/disclosurelog_admin/uploads/F0186521_DOCBD14949CEB_f0186521%20data.pdf

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xiii https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/561312/HMRC-measuring-tax-gaps-2016.pdf

xiv https://www.letsrecycle.com/news/latest-news/how-much-waste-is-avoiding-the-correct-landfill-tax/

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xvi https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29/relateddata

xvii http://www.sita.co.uk/wp-content/uploads/2017/08/SUEZ-AtThisRateReport-1509-web.pdf

xviii http://www.mineralproducts.org/documents/MPA_Cement_SD_Report_Mar17.pdf

xix http://anthesisgroup.com/uk-wood-waste-energy-market/

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