NORTH LINCOLNSHIRE GREEN ENERGY PARK

Planning Act 2008

North Lincolnshire Green Energy Park

Volume 9

9.15 Footprint Services: North Lincolnshire Green Energy Park Supplementary Information

PINS reference: EN010116

December 2022

Revision number: 0

Footprint Services

Sustainability for good

NORTH LINCOLNSHIRE GREEN ENERGY PARK

REGIONAL WASTE ASSESSMENT

REPORT PREPARED FOR SOLAR 21 LTD
AUGUST 2021 (V1.3)

[redacted]

CONTENTS

ABOUT FOOTPRINT SERVICES

Footprint Services ("*FPS*") is a consultancy based in Lincolnshire dedicated to the transformation, interpretation and presentation of information relating to industrial waste and resources. Underpinning this work is a desire to maximise the efficient stewardship of finite resources within the framework of ethical and sustainable enterprise.

Combining data-based analytical investigation with almost fifteen years of Industrial Symbiosis experience, Footprint Services seeks to provide insight, options and opportunities for companies with waste-related challenges.

1. EXECUTIVE SUMMARY

While some landfill sites are currently of regional and national significance, the unavoidable and inescapable truth is that landfill capacity is set to decline over the next decade as the UK Government strives to meet its obligation to reduce general waste disposed of in landfill to 10% of the Municipal Solid Waste (MSW) produced. That will have a direct impact on the region within 100 miles of Flixborough, where 2.9 million tonnes of general waste were sent to landfill in 2019.

Over the next few years, landfill operators will have pressure exerted upon them to facilitate non-recyclable waste. This may be through the approval and development of additional energy recovery facilities (ERFs), which diverts waste tonnage away from landfill, thereby hastening their demise through unprofitability. The reintroduction of a Landfill Tax Escalator, which was previously successful in stimulating the development of Anaerobic Digestion and Energy from Waste facilities across the country as well as creating the option of baling, wrapping and exporting Refuse Derived Fuel (RDF). Ultimately, there is the possibility of a blunt legislative order for enforced closure of landfill sites.

At least 50% of the general waste in the geographical zone of this study is managed by large national or multinational corporate waste companies such as Biffa, SUEZ, Viridor etc. and it will be necessary to engage with such organisations to secure sufficient feedstock. Biffa owns and operates the Roxby landfill facility near Flixborough which received 844,000 tonnes of general waste in 2019, making it the largest such site across the whole of England and Wales. Biffa appears to be confident about the future of the Roxby landfill, this being the flagship site for their waste-by-rail strategy, but this confidence must nonetheless be weighed up against the overt political intent to reduce the percentage of active waste going to landfill.

This study concludes that the EfW provision within 100 miles of Flixborough is currently able to process the residual waste arisings *only because* landfill and RDF export provision provide a combined additional flexible capacity of over three million tonnes. As landfill capacities decline in line with Governmental intent or decree, the existing EfW facilities will be unable to receive the additional volumes since they are already operating at or close to their headline capacity. This is particularly the case in the area up to 50 miles from Flixborough. Decisions made by EU nations, such as the application of the Waste Import Tax in the Netherlands, have been shown to cause shockwaves to the UK waste processing system, as have unforeseen events such as the Coronavirus pandemic. In both these cases, the outcome has been volumes of RDF (or RDF feedstock material) being sent directly to landfill. Taken together, there is certainly scope for a higher level of flexibility in the regional EfW provision.

The Green Energy Centre development at Flixborough is therefore ideally positioned to provide a necessary service as part of a broad tapestry of sustainable solutions in the North of England.

INTRODUCTION

2.1 ABOUT SOLAR 21

Solar 21 is a renewable energy infrastructure company based in Dublin with offices in Italy and the UK. The business began as a developer of commercial solar farms in Italy before diversifying into other renewable energy technologies such as biomass, biogas and Energy from Waste. Their first large-scale power plant, Tansterne Advanced Biomass (23MWe), was commissioned in 2018, powered by waste wood. Currently, they hold a portfolio and pipeline of development projects in the UK.

2.2 NORTH LINCOLNSHIRE GREEN ENERGY PARK

The Project consists of an Energy Recovery Facility (ERF) converting up to 760,000 tonnes per annum of Refuse Derived Fuel (RDF) to generate a maximum of 95MWe and/or 320 MWt to provide power, heat and steam on the site of the operating Flixborough Wharf on the River Trent, North Lincolnshire. The Project will incorporate battery storage, hydrogen production from the electrolysis of water, hydrogen storage, heat and steam storage. It will also include the treatment of bottom and fly ash, concrete block manufacturing, carbon dioxide capture and utilisation and an extended district heat network of 12km, plus a power and gas network to service a nearby proposed housing development. Development at the site will also include the upgrading of rail infrastructure to facilitate the delivery of RDF by low-carbon transportation, as well as improving road access to ease the flow of traffic.

2.3 AIM OF THIS REPORT

The purpose of this study is the assessment, quantification and interpretation of waste flows within a catchment radius of up to 100 miles of the Green Energy Park site near Flixborough, North Lincolnshire (including assessment of wastes entering and leaving the zone, along with the export of RDF), with a particular emphasis on wastes at the 'residual' end of the scale such as Municipal Solid Waste (EWC 20 03 01), RDF (19 12 10) and other sorting fines (19 12 12).

Key questions addressed in this report include:

- **Distance Tiers:** Within the geographical tiers of (A) 0-25 miles, (B) 26-50 miles, (C) 51-75 miles and (D) 76-100 miles, what are the key observations about the waste profile in each of those tiers? Who are the main operators? Where is the waste coming from (i.e. is it 'native' to that tier or are there large transfers in from or out to elsewhere)?
- **Landfill Sites:** What landfill sites are there within each tier? What waste streams are they receiving? What is known about their capacity and expected lifespan remaining?
- **Energy from Waste (EfW) Sites:** What EfW facilities are there within each tier? What is their headline capacity and what is their actual reported throughput? What waste streams are they accepting? Where are they getting their feedstock from? What facilities are in the 'Planning Accepted' or 'Development' phase in each tier?
- **Trends:** For each of the above, what is the latest position and what further insight can be gleaned from a multi-year trend analysis?

2.4 DATA SOURCES

The primary data sources used within this report include:

- ***Site Waste Returns:*** all regulated waste sites are obliged to submit waste input / output records to the EA and this information is made available as public record for strategic review, showing waste flows entering and leaving the site or area. This data is produced annually rather than real-time, so there is always a lag between actual year and 'data year'. The latest available 'data year' is 2019.
- ***RDF Transfrontier Shipment Records:*** the EA release certain data pertaining to RDF exports either on a scheduled basis or via Freedom of Information requests. This information covers month-by-month exports of waste fuels categorised as EWC 19 12 10 (although with some volumes of 19 12 12 that are due to be

refined to 19 12 10 in the destination country), along with country of destination and port of exit / entry. This data has a lag of around three months; therefore, this report uses information up to and including April 2021.

- ***Incineration Trends:*** data tables are available for incineration inputs and capacity across England, down to the level of individual sites. 2019 is the latest activity reported.
- **Landfill Capacity**: datasets for remaining landfill capacity by site in England at the end of 2019.

2. APPROACH

3.1 EWC CODES OF RELEVANCE

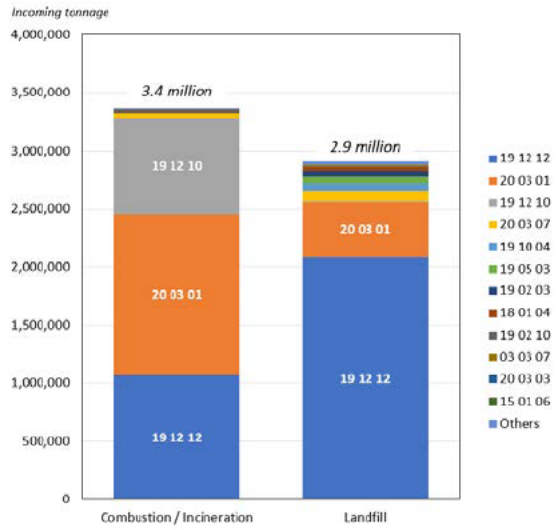


Fig. 3.1 – Main EWC Codes in Landfill / EfW [1]

Given that the facility being developed at Flixborough is an EfW process intended for the recovery of unrecyclable general wastes that might otherwise be sent to landfill, the analysis and data presented in this report makes such waste streams the key focus rather than including higher-value resources such as segregated plastics or cardboard (or non-combustible materials e.g., glass, inert spoil etc).

What, then, are the EWC codes of relevance? The main general waste codes received by either EfW or landfill sites within 100 miles of Flixborough are identified in Fig. 3.1. These 12 specific codes account for 98% of general waste feedstock to EfW and 93% to landfill sites. Within this code selection, it is apparent from Fig. 3.1 that most of the incoming general waste is categorised as either 19 12 12, 20 03 01 or 19 12 10. Fig. 3.2 then shows the total recorded volume of these EWC codes of relevance received by all permitted sites within 100 miles of Flixborough (except Transfer Stations), totalling almost 12 million tonnes.

EWC Code	0-25 miles	26-50 miles	51-75 miles	76-100 miles	TOTAL
20 03 01 (Mixed municipal waste)	498,017	1,570,793	1,289,332	2,319,297	***5,677,439***
19 12 12 (Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11)	1,145,009	770,588	419,070	1,712,222	***4,046,889***
19 12 10 (Combustible waste (Refuse Derived Fuel))	106,399	670,971	57,977	165,006	***1,000,353***
20 03 07 (Bulky waste)	8,523	36,965	74,105	158,377	***277,970***
19 10 04 (Fluff-light fraction and dust other than those mentioned in 19 10 03)	13,425	11,581	0	161,914	***186,920***
19 05 03 (Off-specification compost)	22,895	31,634	31,315	80,645	***166,489***
20 03 03 (Street-cleaning residues)	17,646	54,008	13,681	70,181	***155,516***
19 02 03 (Premixed wastes composed only of non-hazardous wastes)	30,743	2,832	1,976	76,628	***112,179***
15 01 06 (Mixed packaging)	5,482	9,552	22,009	18,593	***55,636***
19 02 10 (Combustible wastes other than those mentioned in 19 02 08 and 19 02 09)	21,681	1,580	7,749	24,424	***55,434***
18 01 04 (Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers))	346	13,462	2,656	22,762	***39,226***
03 03 07 (Mechanically separated rejects from pulping of waste paper and cardboard)	0	3,796	0	17,585	***21,381***
TOTAL:	***1,870,166***	***3,177,762***	***1,919,870***	***4,827,634***	***11,795,432***

Fig. 3.2 – General Waste EWC Codes of interest in this report received at all permitted sites exc. Transfer Stations

Hereafter in this report, unless specified otherwise, the analysis pertains to the 12 EWC codes listed above, ensuring that the conclusions drawn are relevant to an EfW context.

[1] *Within 100 miles of Flixborough*

3. OVERVIEW

4.1 WITHIN 100 MILES OF FLIXBOROUGH

Taking as a starting position the question of the recorded waste volumes within 100 miles of Flixborough, EA figures account for a total of 63 million tonnes received by permitted waste sites in 2019 (the latest dataset available at the time of production of this report). That number includes materials not relevant to this investigation such as construction and demolition spoil, segregated biomass, textiles, plastics etc. Refining the search to general waste codes,[2] this total reduces to 11.8 million tonnes, which encompasses all sources irrespective of whether they are from municipal or commercial / industrial collections.

		General Waste codes only				
Distance	**Incoming Tonnage (all waste)**	**Landfill**	**Combustion / Incineration**	**Physical / MRF**	**Other**	***TOTAL***
0-25 miles	7.2 million	866,000	30,000	777,000	197,000	*1.9 million*
26-50 miles	18.6 million	588,000	1.4 million	775,000	422,000	*3.2 million*
51-75 miles	10.9 million	280,000	634,000	597,000	409,000	*1.9 million*
76-100 miles	26.3 million	1.1 million	1.3 million	1.2 million	1.2 million	*4.8 million*
TOTAL	***63.0 million***	***2.9 million***	***3.4 million***	***3.3 million***	***2.2 million***	***11.8 million***

Fig. 4.1 – Waste Incoming to Permitted Facilities Within 100 Miles of Flixborough

Of the 11.8 million tonnes accounted for in Fig. 4.1, 2.9 million tonnes were received at landfill sites, 3.4 million tonnes at EfW facilities etc. Within 50 miles of Flixborough, 1.5m tonnes of general waste was received at landfill, whereas in the (geometrically larger) 50 - 100 mile 'doughnut', the volume was 1.4m tonnes, suggesting an over-representation of, or reliance on, landfill in the area surrounding Flixborough.

Risk Of Double Counting: Of the 3.3m tonnes received at Physical / MRF processing sites, it is likely that some of the general waste handled by such sites would be sent to either landfill or EfW, again under a general waste code. That volume would logically appear in the data twice since it has passed over the incoming weighbridge of two distinct facilities. Unfortunately, there is no way of eliminating such double counting that would not simply impair the wider validity of the data through the application of questionable guesswork. The trends and narrative revealed by the data are sufficiently informative and robust to draw valid conclusions, but such scenarios should be borne in mind rather than viewing the figures as accurate and unique down to each tonne.

It is evident that the greatest risk of double counting arises when waste arrives at one site, is dispatched and subsequently is received by another permitted facility. Such fluidity would not be expected to occur between landfill sites and EfW, insofar as volumes received at each such site remain there, either for burial or combustion in an end-of-life process. Therefore, the figures recorded as landfill (Fig. 4.2) or EfW (Fig. 4.3) are logically more trustworthy than for 'throughput' sites.

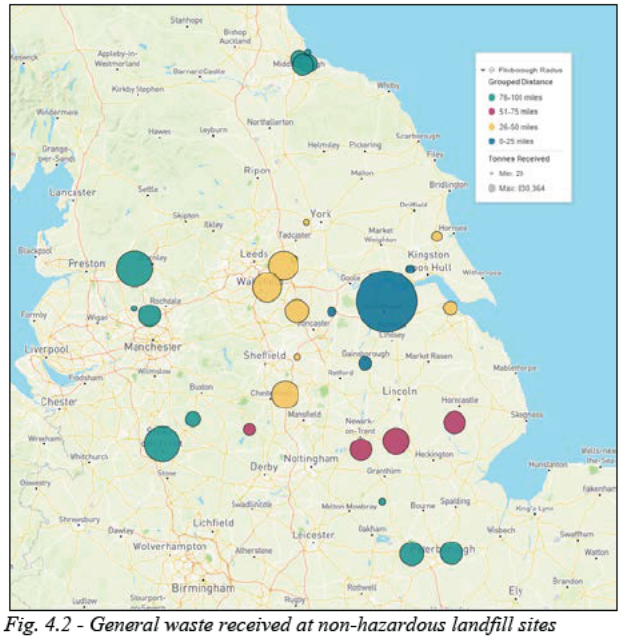


Fig. 4.2 - General waste received at non-hazardous landfill sites

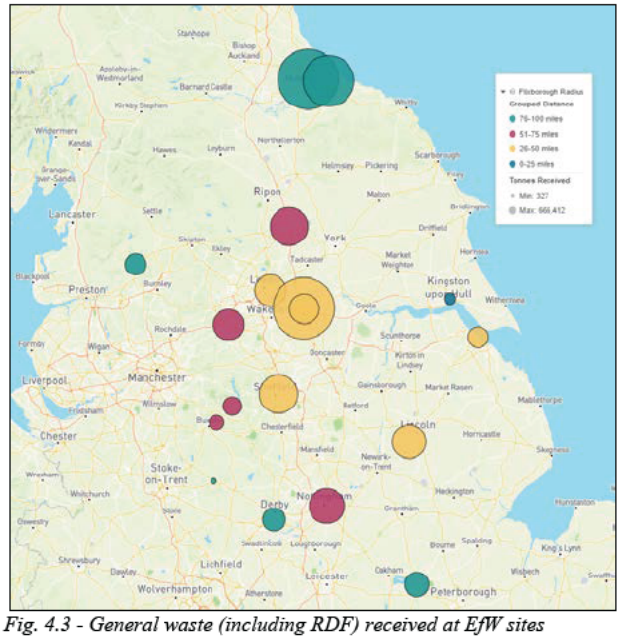


Fig. 4.3 - General waste (including RDF) received at EfW sites

[2] *Using EWC codes – see Section 3.1*

4.2 TRANSFER STATIONS

Transfer Stations warrant special mention. A Transfer Station, being a building or processing site for the temporary storage, consolidation and aggregation of waste, typically carries out very little segregation processing; they tend to be relay points rather than facilities where value is added. Such facilities have been excluded in Fig. 4.1 to reduce the risk of overstating the figures. However, there will be times in this report where it is helpful to be aware of regional Transfer Stations, and so the intention is to be clear as to whether they are included or not.

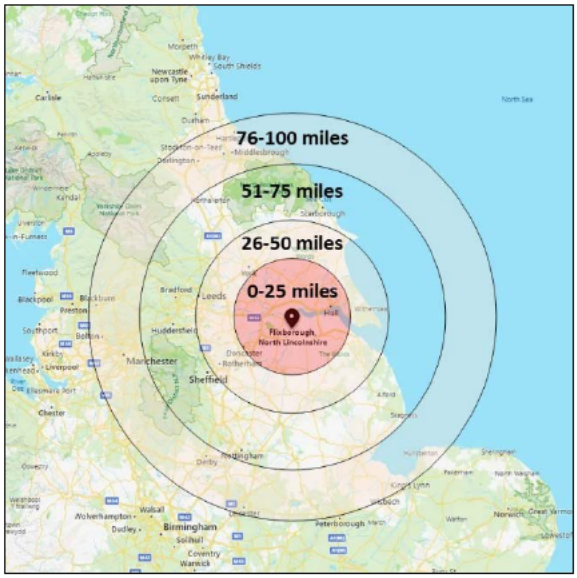


Fig. 4.4 – Radial Zones from Flixborough (Map)

4.3 RADIAL ZONES

The objective within this report is to identify the current waste processing profile within radial zones around Flixborough in increasing order of distance, these being (a) 0 - 25 miles, (b) 26 - 50 miles, (c) 51 - 75 miles and (d) 76 - 100 miles. Fig. 4.4 shows the approximate geographical extent of such zoning, notwithstanding the local distance anomalies caused by natural features such as estuaries where there will be a need to travel additional miles to cross over a bridge. Within 100 miles of Flixborough, one reaches Leicester to the South, Bolton to the West and Hartlepool to the North, encompassing major urban areas such as Lincoln, Leeds, York, Manchester, Nottingham, Derby, Bradford and Middlesbrough.

Furthermore, Flixborough benefits from excellent logistical accessibility, with good connections particularly by road, seaports and wharfage (and the Green Energy Park development aims to improve these links even more).

However, when reviewing Fig. 4.4, an issue becomes apparent. Within the 0 – 25-mile zone, useful insight can be gleaned about waste arisings, where waste has come from and where it goes, and such insight is both practical and purposeful in the context of the Flixborough project. Further out, though, the same logic may not hold true; the waste flow profile in the vicinity of Middlesbrough and Hartlepool to the North has little bearing on activity around Nottingham and Derby to the South. Therefore, although simple flow diagrams can be produced for 0 – 25-miles, that becomes much more difficult, complex and obscure within the outer zones.

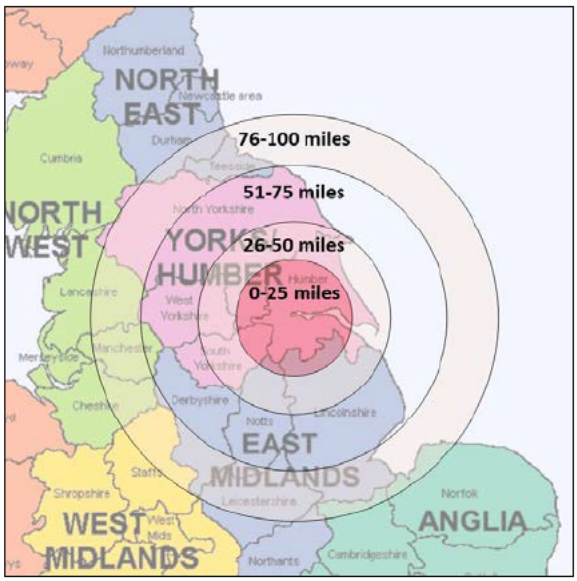


Fig. 4.5 – Radial Zones from Flixborough (Regional)

Mindful of this challenge, an approach has been taken later in this report of splicing the radial zones with traditional regional boundaries (Northeast, Northwest, East Midlands etc), so that distinction can be made between (76 – 100-mile) activity in the Northeast and (76 – 100-mile) activity in the East Midlands.

This leads to the following zoned blocks:

Zone	Miles	Region	Tonnage
A	0-25	Yorks & Humber	1.8 million
B	0-25	East Midlands	22,000
C	26-50	Yorks & Humber	2.8 million
D	26-50	East Midlands	414,000
E	51-75	Yorks & Humber	906,000
F	51-75	East Midlands	1.0 million
G	76-100	Yorks & Humber	42,000
H	76-100	North West	2.0 million
I	76-100	North East	1.5 million
J	76-100	West Midlands	356,000
K	76-100	East Midlands	647,000
L	76-100	East of England	194,000
		TOTAL:	**11.8 million**

Fig. 4.6 – Zoned Blocks Around Flixborough

Zones B, G and L have been highlighted to make the point that some areas will be of less strategic interest than others, either because that geographical region only just appears in a distance radius at its outer edge (such as East of England in the 76 – 100-mile ring), or because a particular area has low population or industrial presence (such as Yorkshire & Humber in the 76 – 100-mile ring).

4.4 WITHIN 50 MILES OF FLIXBOROUGH

The territory of primary interest is the area within 50 miles of Flixborough, this being where most commercially viable sourcing opportunities are likely to exist. Within this radius, just over 5 million tonnes of relevant general waste were received by permitted waste facilities (excluding Transfer Stations); of that volume, just under 3 million tonnes went to landfill or EfW in roughly equal measure (see Fig. 4.7)

The main landfill volumes are within the North Lincolnshire subregion, whereas the bulk of the EfW capacity is in West Yorkshire (see Fig. 4.8).

'Physical / MRF' includes sorting companies with physical processes, picking lines, optical sorting and other physical separation technologies.

'Other' companies in Fig. 4.8 includes MBT (Mechanical and Biological Treatment), civic amenity, composting sites etc.

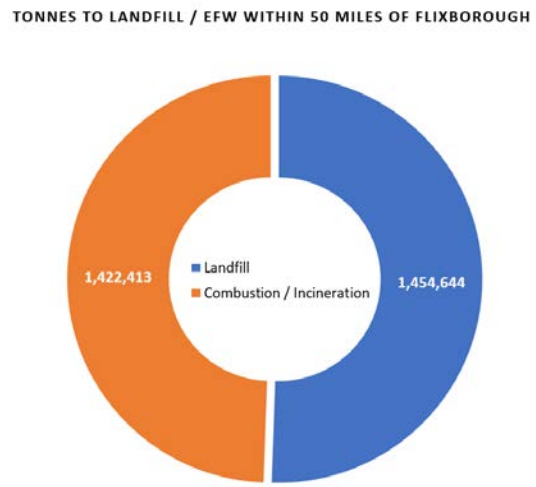


Fig. 4.7 – Tonnage to landfill / EfW within 50 miles

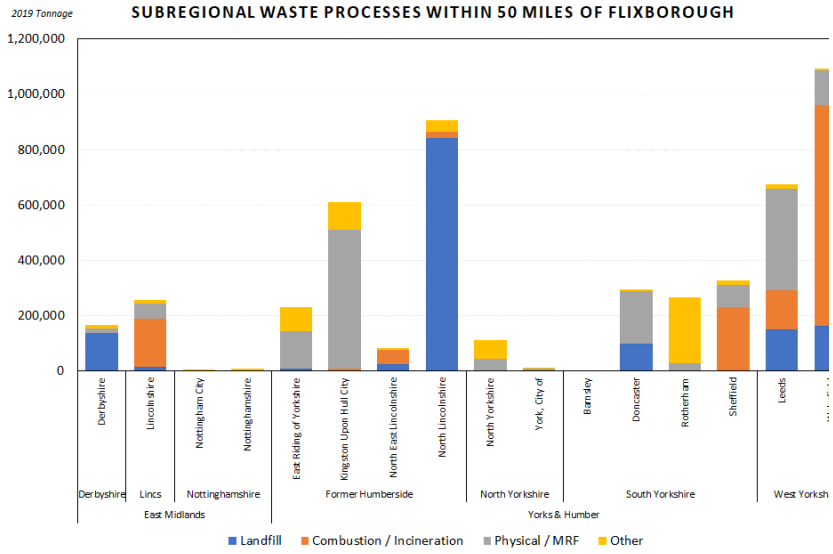


Fig. 4.8 – Subregional Waste Processes Within 50 Miles of Flixborough

The evident message of Fig. 4.8 is that if the aspiration of the development is to offer a competitive solution for producers and processors of waste that is higher up the hierarchy than landfill, then North Lincolnshire would appear to be the location of choice.

4. LANDFILL

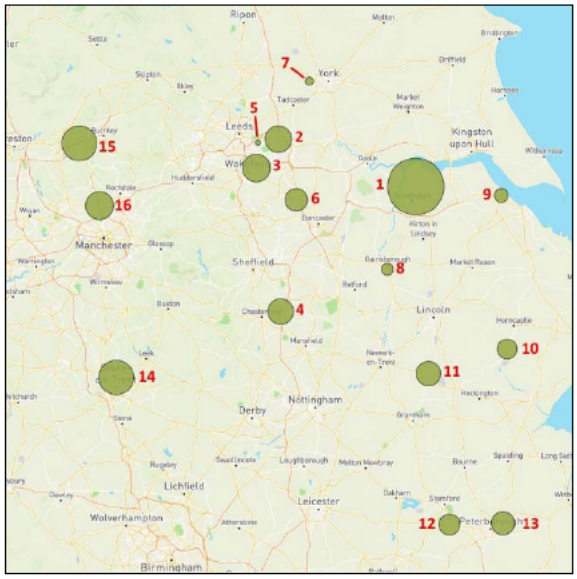
5.1 OVERVIEW

This study considers only those landfills that receive general waste, meaning that landfill sites that are exclusively for inert or hazardous wastes are excluded and ignored.

Within 100 miles of Flixborough, there are 32 landfill sites that received general waste in 2019; tonnages ranged from 48 tonnes to 844,000 tonnes. Collectively, these facilities accepted 2.9 million tonnes of general waste as per the breakdown in Fig. 4.1.

Of these sites, the top 16 took in 2.6 million tonnes, amounting to 87% of the total. These 16 sites are identified in Fig. 5.1.

Fig. 5.1 – Main General Waste Landfills (Within 100 Miles)



KEY:

0-50 miles:

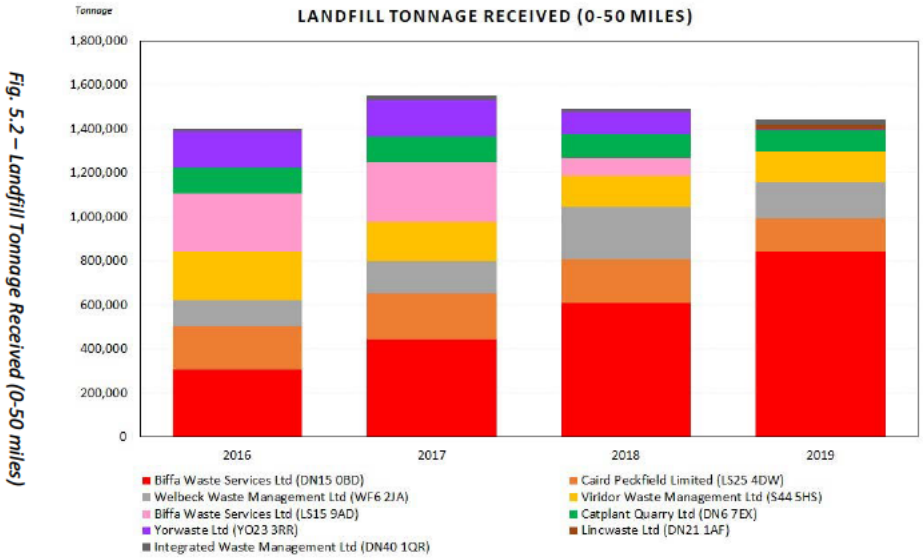
1	Biffa Waste Services Ltd (DN15 0BD)
2	Caird Peckfield Limited (LS25 4DW)
3	Welbeck Waste Management Ltd (WF6 2JA)
4	Viridor Waste Management Ltd (S44 5HS)
5	Biffa Waste Services Ltd (LS15 9AD)
6	Catplant Quarry Ltd (DN6 7EX)
7	Yorwaste Ltd (YO23 3RR)
8	Lincwaste Ltd (DN21 1AF)
9	Integrated Waste Management Ltd (DN40 1QR)

51-100 miles:

10	Lincwaste Ltd (LN10 6YN)
11	Lincwaste Ltd (LN5 0QF)
12	Augean plc (PE8 6NH)
13	Biffa Waste Services Ltd (PE6 7TH)
14	Red Industries Limited (ST6 2DZ)
15	SUEZ Recycling and Recovery UK Ltd (BB5 5EN)
16	Viridor Waste Management Ltd (BL9 8QZ)

The Biffa Waste Services (DN15 0BD) facility is Roxby Landfill, evidently the largest site by general waste received (not only in the geographical range of this study but also across the whole of England and Wales). Furthermore, the Roxby landfill has been accepting more and more waste each year since 2016 (see Fig. 5.2). For the nine sites within 50 miles of Flixborough, the received volume has been around 1.5 million tonnes per year between 2016 and 2019, with Biffa Roxby having increasing dominance.

Fig. 5.2 – Landfill Tonnage Received (0-50 miles)



Capacity-wise, Fig. 5.3 suggests there has been a significant fall in available room, with the drop appearing to be due to more than simply the gradual filling of cell space, especially with the Welbeck Waste Management (WF6 2JA) landfill.

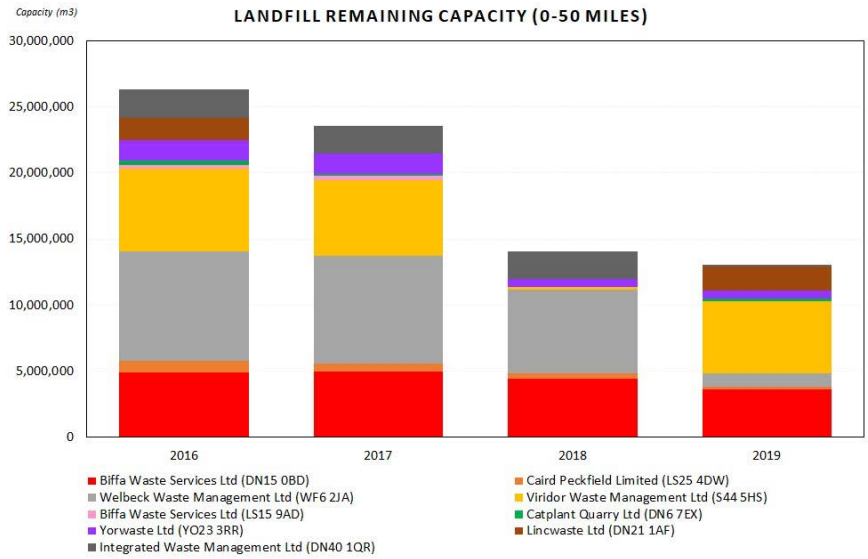


Fig. 5.3 – Capacity Remaining (0-50 miles)

Section 5.2 provides further insight into the Biffa Roxby (DN15 0BD), Welbeck (WF6 2JA), Caird Peckfield (LS25 4DW) and Catplant Quarry (DN6 7EX) landfill sites, as well as the Viridor (S44 5HS) facility.

Further out from Flixborough, the seven key landfills appear to have received more waste year-on-year, contrary to the public and industry perception that landfill volumes have been falling (see Fig. 5.4)

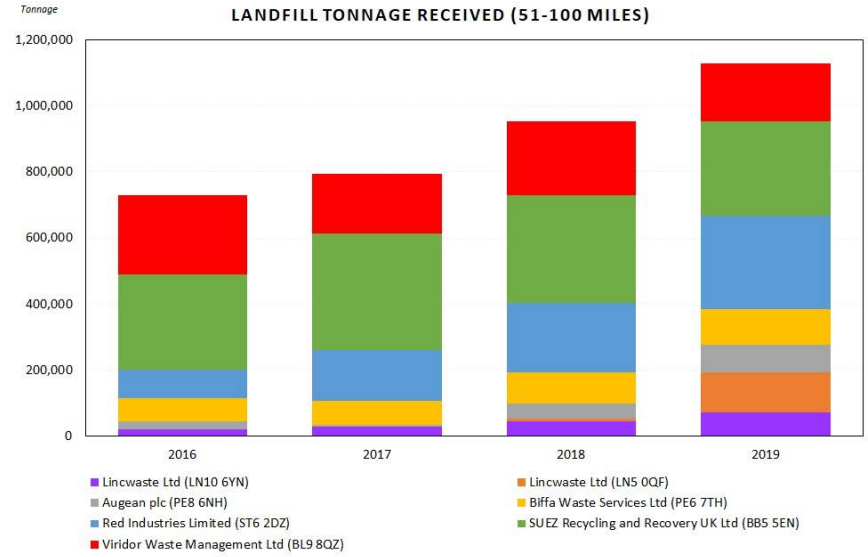


Fig. 5.4 – Landfill Tonnage Received (51-100 miles)

Note that the Lincwaste sites (LN5 0QF and LN10 6YN) in the 51–100-mile tier and also the DN21 1AF facility in the 0–50-mile tier has been receiving more general waste, especially in 2019. Lincwaste Ltd is a wholly owned subsidiary of FCC Waste Services (UK) Ltd. Further investigation shows that the bulk of the additional waste received in 2019 came from Nottingham. These three sites have a declared combined capacity of just over 2 million tonnes. The LN5 0QF site is known locally as Leadenham Landfill. This had previously been mothballed following Local Authority budget cuts in the early 2010s but was subsequently reopened. An excerpt from a recent Lincolnshire Waste Needs Assessment [3] states:

"*Planning permission for non-hazardous waste landfill covers most of the quarry, but the EA value relates solely to the southern area. The site had been mothballed for several years but has recently reopened following closure of several other sites. It is expected to become one of the most important landfill sites in the county. To reflect this new status, the operator is to open the large northern area for landfill. Actual capacity will be substantially greater than that stated.*"

The same document concludes that:

[3] *www.lincolnshire.gov.uk/downloads/file/6039/overview-report*

"*The Waste Needs Assessment 2021 Update shows that no capacity shortfall is forecast whether that be measured by management type or as an overall requirement for Lincolnshire to maintain net self-sufficiency over the forecast period to 2045.*"

This is based on a model of utilising the capacity of the EfW facility in Lincoln primarily, with landfill capacity being the flexible secondary outlet.

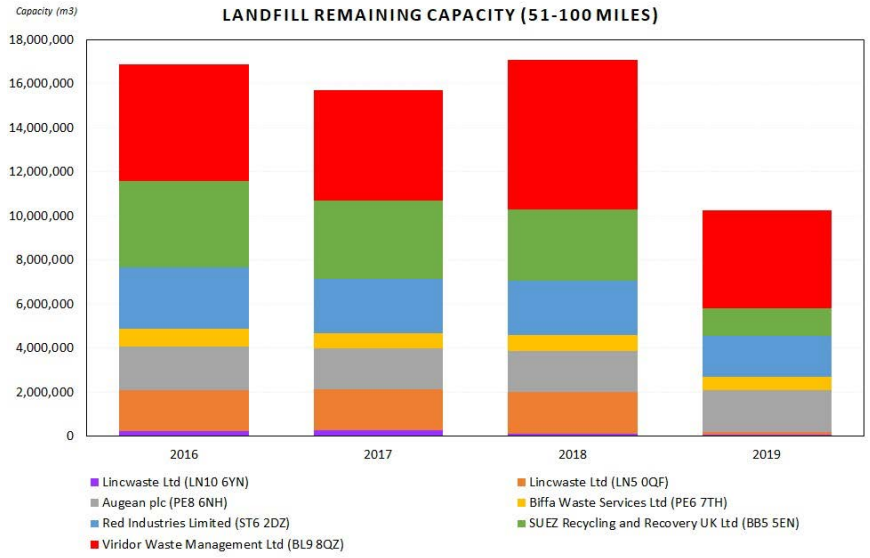


Fig. 5.5 – Capacity Remaining (51-100 miles)

For all the lack of certainty surrounding declared landfill capacity, given that under-utilised cells can be mothballed, or new cells can be developed, Fig. 5.6 shows an unmistakable trend; the headline capacity of the 16 primary landfill sites is heading downwards even as the received waste is nudging upwards.

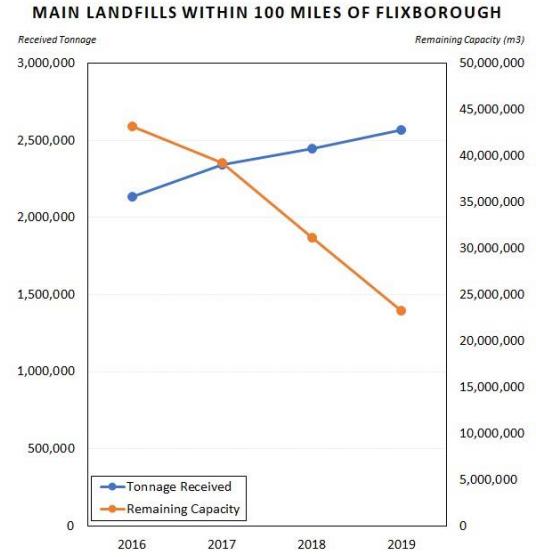


Fig. 5.6 – Main Landfills Within 100 Miles Of Flixborough

Defra, in their 'Resources and Waste Strategy' (2018) confirmed their continued resolve to reducing general waste sent to landfill, summarising their intent as, "The desired direction for all indicators of landfilling is down."

The commitment within this Defra strategy document, driven by the EU Circular Economy Package (which the UK Government has committed to honouring) is to reduce landfill to a maximum of 10% of municipal waste by 2035.

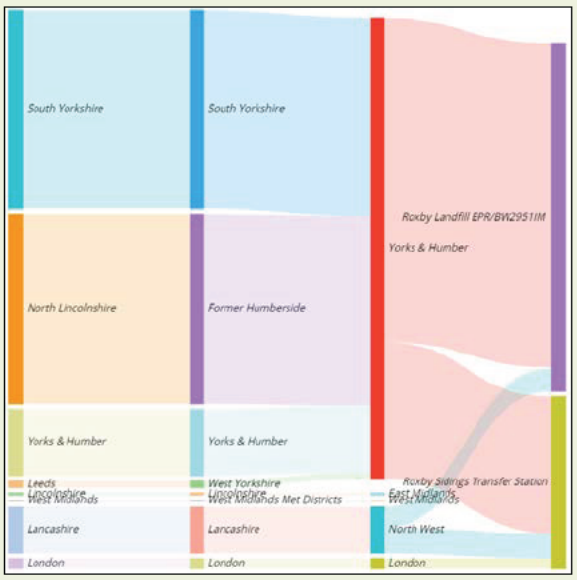
To apply some numbers to this within the geographical zone covered by this study, if 11.8 million tonnes of general waste was received by permitted waste sites in 2019, 10% of this amounts to 1.2 million tonnes. Presently, 2.9 million tonnes is being landfilled, or almost 25% of the total general waste arisings. This is not a 'Northern thing' either as the overall figure for England is similar. Thus, on current waste production levels, it will be necessary to somehow redirect approximately 1.7 million tonnes away from landfill by 2035. Naturally, waste volumes may fall, and recycling technologies should improve, and not all the 'general waste' that is typically sent to landfill is appropriate for EfW treatment. Nonetheless, it can be surmised that additional EfW capacity of at least one million tonnes will be needed in the 100-mile catchment of Flixborough over the next decade if the binding environmental commitment is to be met and the reliance on landfill reduced.

5.2 BIFFA WASTE SERVICES (DN15 0BD)

Biffa Waste Services Ltd has two sites registered at postcode DN15 0BD: the non-hazardous landfill (Roxby Landfill) facility and also a corresponding transfer station (Roxby Sidings). Biffa has an ambition of moving 50% of its waste traffic by rail by 2025 through a partnership with GB Railfreight and, in May 2021, opened a new rail hub in Barking to facilitate the transportation of waste from London to Roxby Landfill as well as to its landfills at Leeds (LS15 9AD) and Manchester (M27 8LN) [4] [5]. **The Biffa website states that the Renwick Road (Barking) site will be able to transport 250,000 tonnes of waste per year.**

It is reasonable to assume that much of the waste incoming to Roxby Sidings is then received at Roxby Landfill afterwards (indeed the data supports this).

Fig. 5.7 - Biffa Waste Services Ltd (DN15 0BD)

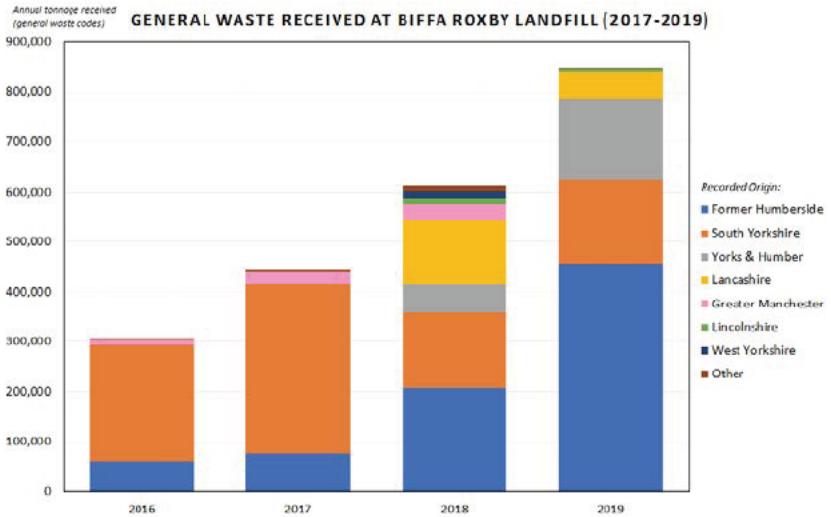


Roxby Landfill:	Tonnage:
South Yorkshire:	168,150
Former Humberside:	456,873
Yorks & Humber:	161,010
Lancashire:	53,605
Lincolnshire:	4,223
West Midlands:	56
TOTAL:	***843,917***

Roxby Sidings:	Tonnage:
South Yorkshire:	312,236
West Yorkshire:	16,752
Former Humberside:	3,772
Lancashire:	60,910
London:	22,963
TOTAL:	***416,633***

Fig. 5.7 suggests that, of the 844,000 tonnes received into the landfill site, roughly half of it was transferred from Roxby Sidings (which is likely to be the majority part of the 457k designated as originating from 'North Lincolnshire' / 'Former Humberside'). The exact apportionment of the origination is unclear; is the stream from Lancashire into Roxby Sidings the *same* material received from Lancashire into Roxby Landfill, or do they represent *separate and distinct* activities? The answer is unknown. Even so, the data affirms what one would logically predict, that the tonnage into Roxby Sidings originated from further afield. The opening of the new rail hub at Barking will increase the volume from London in future years.

Fig. 5.8 – General Waste Received At Biffa Roxby Landfill



Assessing the trend over recent years (and bearing in mind that the 2019 'origination' data is somewhat obscured by the use of Roxby Sidings), it is apparent that Biffa's Roxby landfill has succeeded in both increasing its received volume of general waste and widening its catchment area. The adoption of Roxby Sidings and the opening of new rail hubs suggests that Biffa is confident in the robustness of this trend. But is that confidence justified?

[4] [redacted]

[5] *The Leeds Biffa landfill (Skelton Grange, LS15 9AD) appears to be closed to General Waste and is now only receiving mainly Naturally Occurring Minerals 17 05 04 and 19 12 09, presumably capping materials. The Manchester landfill (Clifton Hall, M27 8LN) has a reported capacity of zero, and has also only been receiving capping materials for the past few years.*

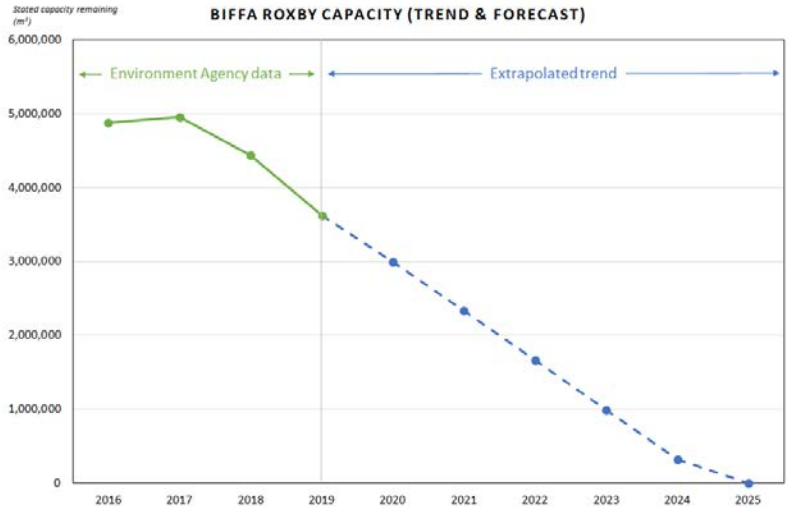


Fig 5.9: Capacity and expected lifespan of Biffa Roxby landfill

According to the EA, Biffa Roxby landfill had a capacity of 3.6 million cubic metres in 2019, down from almost 5 million cubic metres in 2017. Extending this decline downwards, the facility only has a viable lifespan of around a further four or five years, especially if Biffa intends to increase the amount of waste received through the Roxby Sidings transfer station. Lifespan is not always a linear pattern though, as can be seen in the data between 2016 and 2017; it all depends on whether the facility has undeveloped void capacity that can be brought into service as fresh cells, thereby extending the lifespan.

5.3 THREE YORKSHIRE LANDFILLS (WELBECK / CAIRD PECKFIELD / CATPLANT)

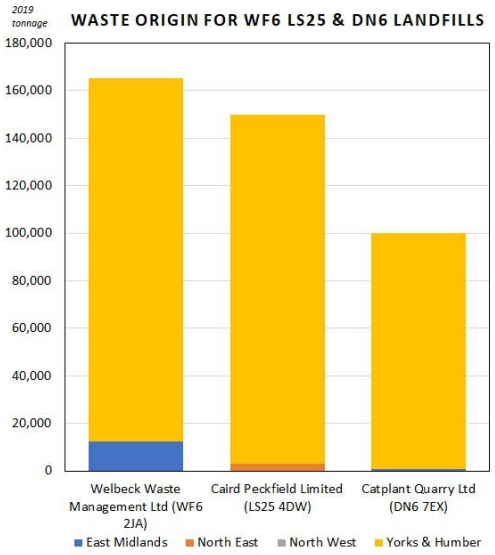


Fig. 5.10 – Waste Origins (3 landfills)

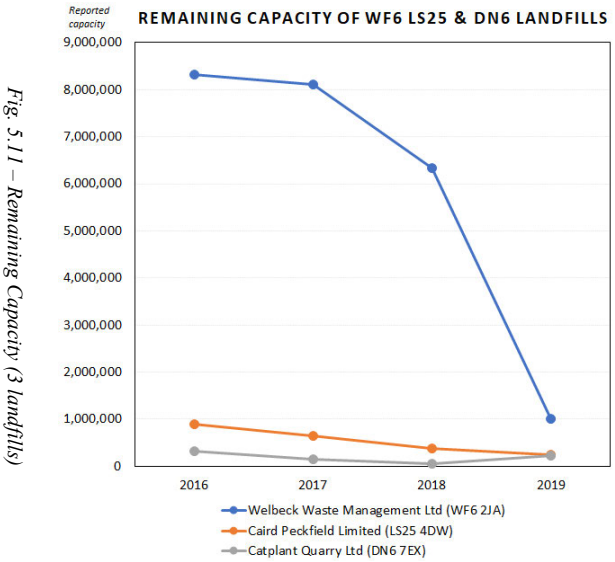


Fig. 5.11 – Remaining Capacity (3 landfills)

Fig. 5.1 showed three key landfill sites in Yorkshire which, between them, received just over 400,000 tonnes of general waste in the filtered set of EWC codes. One of these sites, Welbeck Waste Management Ltd, is a wholly owned subsidiary of FCC Waste Services (UK) Ltd. This site has a lease until 2033; this is not expected to be extended [6]. This timescale includes the post-closure environmental monitoring; waste receipts are not anticipated beyond 2025 [7]. It is likely that this termination date is shaping the remaining capacity as presented in Fig. 5.11 where the Welbeck capacity has plunged over recent years far beyond what would be expected purely from received waste volumes.

Of the other two sites, the input-to-capacity figures at Caird Peckfield Ltd suggest that it does not have a lifespan beyond the next couple of years, unless new cell capacity is opened. Catplant Quarry is an active quarry site and therefore the landfill capacity will be determined by void space left by quarrying operations; this could explain the apparent rise in capacity between 2018 and 2019 (Fig. 5.11).

6 [redacted]

7 [redacted]

5.4 TWO NORTH-WEST LANDFILLS (VIRIDOR BL9 / SUEZ BB5)

Fig. 5.1 showed two landfill sites in the Northwest within the 100-mile radius, these being Viridor's "Pilsworth South" (BL9 8QZ) and the Suez "Whinney Hill" (BB5 5EN) operations.

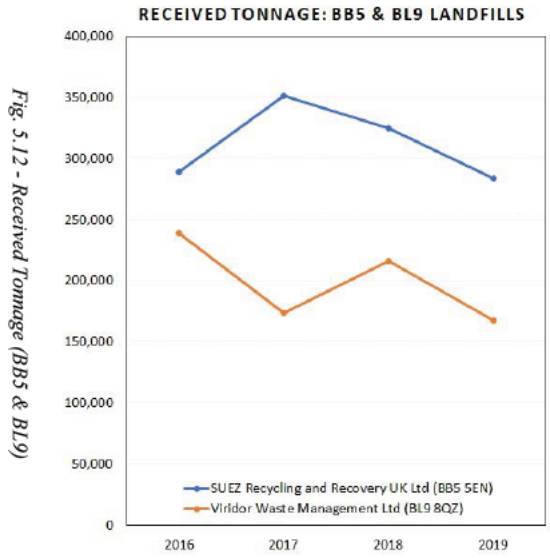


Fig. 5.12 - Received Tonnage (BB5 & BL9)

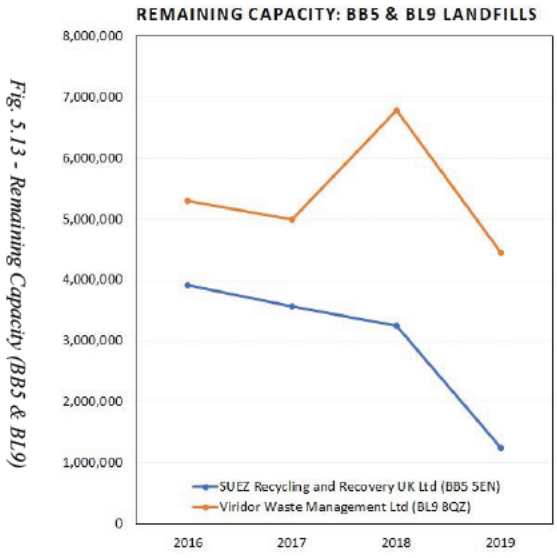


Fig. 5.13 - Remaining Capacity (BB5 & BL9)

There had been plans for the expansion of Pilsworth South, but these are now unlikely to proceed [8] due to reducing volumes and the scheduled closure of the site in 2028. Almost all of the waste received at these two sites originates in the Northwest.

5.5 VIRIDOR WASTE MANAGEMENT LTD (S44 5HS) – ERIN LANDFILL

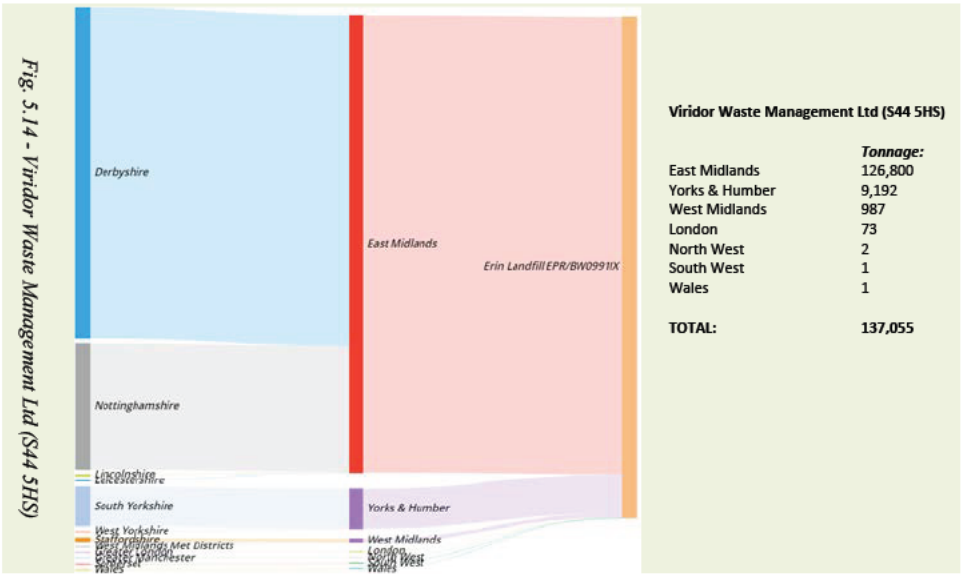


Fig. 5.14 - Viridor Waste Management Ltd (S44 5HS)

Viridor Waste Management Ltd (S44 5HS)

	Tonnage:
East Midlands	126,800
Yorks & Humber	9,192
West Midlands	987
London	73
North West	2
South West	1
Wales	1
TOTAL:	**137,055**

The Viridor Erin landfill site near Chesterfield was due to close in 2021, but this has been extended until 2035, a decision received with dismay by residents [9]. Fig. 5.14 indicates that the bulk of the incoming material originates in Derbyshire / Nottinghamshire / South Yorkshire, these being areas in the immediate surroundings of the site. Viridor have claimed that the delay is needed because of reduced incoming tonnage to the site, so the landfill is taking longer to fill than originally scheduled. This is borne out by the data, where incoming general waste has been: (2016) 221k, (2017) 174k, (2018) 140k, (2019) 137k. The latest reported capacity of the landfill site is 5.3 million tonnes.

5.6 TWO EAST OF ENGLAND LANDFILLS (AUGEAN PE8 6NH / BIFFA PE6 7TH)

The two smaller landfill sites shown in Fig. 1 at the lower edge of the geographical range, within the East of England, are Thornhaugh Landfill (owned by Augean) and Eye North-eastern Landfill (owned by Biffa).

[8] *Greater Manchester Joint Waste Development Plan Authority Monitoring Report 2019-20*

[9] [redacted]

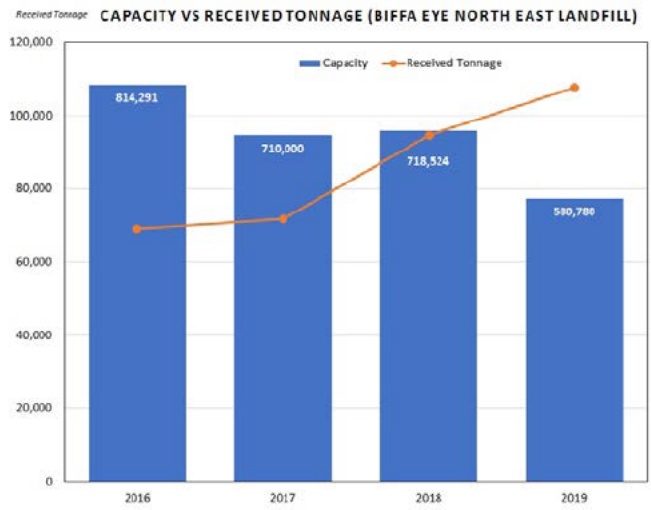


Fig. 5.15 – Biffa Eye North Eastern (PE6 7TH)

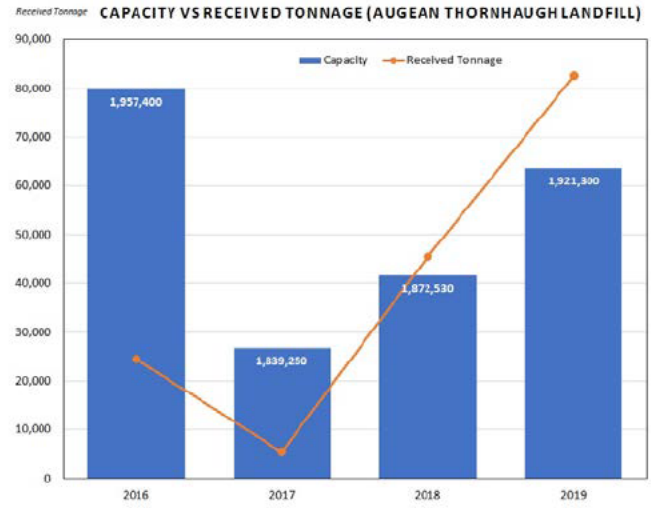


Fig. 5.16 – Augean Thornhaugh (PE8 6NH)

Both landfills have recorded a trend of rising incoming general waste volumes over the past few years. The Biffa site displays a downward capacity as cell space is gradually filled; paradoxically, the Augean site appears to have more spare capacity the more it is filled.

The Biffa site receives most of its waste (75%) from the East of England (Cambridgeshire / Hertfordshire / Norfolk), with the remaining 25 mostly from the East Midlands (Lincolnshire and Leicestershire).

The Augean site sources its incoming waste almost entirely from Northamptonshire.

5.7 TOP 20 GENERAL WASTE LANDFILL SITES (ENGLAND)

Fig. 5.17 presents a ranked table of the top 20 landfill sites in England by the volume of general waste received in 2019. Of these 20 sites, five are within 100 miles of Flixborough. Particularly striking is the fact that the Biffa Roxby site occupies the top spot, only four miles from the planned Green Energy Park development.

Fig. 5.17 - Top 20 Landfills (England) by General Waste tonnage

Rank	Operator	Distance	General Waste Received	Region
1	Biffa Waste Services Ltd (DN15 0BD)	4	844,003	Yorks & Humber
2	Veolia ES (UK) Ltd (RM16 5TZ)	204	695,147	East of England
3	Veolia ES (UK) Ltd (RM13 9YB)	205	586,876	London
4	FCC Waste Services (UK) Ltd (MK3 5FR)	153	554,184	South East
5	Biffa Waste Services Ltd (SG12 0ES)	172	550,574	East of England
6	Biffa Waste Services Ltd (WS11 8NQ)	114	445,125	West Midlands
7	Biffa Waste Services Ltd (RH1 4ER)	224	382,666	South East
8	3C Waste Ltd (CH2 4JP)	124	328,424	North West
9	Octagon Green Solutions Limited (NE21 4SX)	137	311,316	North East
10	SUEZ Recycling and Recovery UK Ltd (BB5 5EN)	93	284,242	North West
11	Red Industries Limited (ST6 2DZ)	98	283,012	West Midlands
12	Tarmac Aggregates Limited (LE17 6AA)	115	278,821	East Midlands
13	FCC Waste Services (UK) Ltd (OX14 4PW)	188	277,609	South East
14	Veolia ES (UK) Ltd (HP9 1XD)	189	276,020	South East
15	Veolia ES (UK) Ltd (CV23 9HH)	124	256,815	West Midlands
16	Viridor Waste Management Ltd (IP6 0NW)	173	188,999	East of England
17	Anti-Waste Ltd (PE19 5UH)	125	179,323	East of England
18	Viridor Waste Management Ltd (BL9 8QZ)	87	175,662	North West
19	Welbeck Waste Management Ltd (WF6 2JA)	42	169,496	Yorks & Humber
20	Enovert Ltd (CO3 5NN)	185	165,733	East of England

5. ENERGY FROM WASTE

6.1 OVERVIEW

Within 100 miles of Flixborough, there is presently just over 4 million tonnes of operational EfW capacity, this being the incineration of general waste (municipal and Commercial / Industrial) excluding specialist incineration such as biomass, clinical, co-firing (e.g., cement works receiving SRF) etc. There is a further 840,000 tonnes' worth of capacity at sites presently undergoing physical development, and it is assumed in this study that these facilities will progress through to commissioning and full operation. Beyond that, there are numerous sites that have passed the stage of Planning Approval but have not yet progressed to development; the capacity of this group amounts to just over 6.5 million tonnes (see Fig. 6.1).

Status	0-25 miles	26-50 miles	51-75 miles	76-100 miles	TOTAL:
EfW (Operational)	0	1,930,000	730,000	1,341,000	**4,001,000**
EfW (Development)	240,000	410,000		190,000	**840,000**
EfW (Planning Approved)	250,000	2,192,500	1,315,000	2,889,000	**6,646,500**
TOTAL:	**490,000**	**4,532,500**	**2,045,000**	**4,420,000**	**11,487,500**

Fig. 6.1 - Annual Capacity of EfW by Status and Distance

Should all the development / planning sites reach operational status, then the total tonnage capacity of EfW within 100 miles of Flixborough would be almost 11.5 million tonnes. How does that compare with the volume of applicable general waste received by regulated waste sites including MRFs, landfill, EfW etc but excluding Transfer Stations? Fig. 6.2 gives a breakdown for each radial tier, showing the capacity of EfW (including development and planning) alongside the general waste received by facilities in that tier. It is immediately apparent that there is a noticeable gap between the total incoming waste and the EfW capacity in the 0 - 25 miles tier, given the presence of the Biffa Roxby landfill but the lack of any operational EfW facilities. Note, the Flixborough facility is not included in the chart, though even if it were, the EfW column would still be smaller than the yellow General Waste bar.

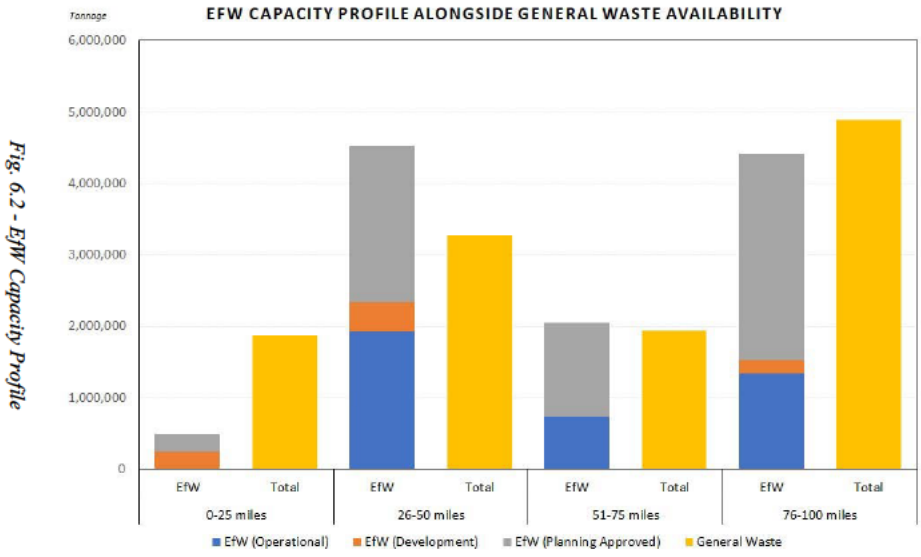


Fig. 6.2 - EfW Capacity Profile

In the 26 – 50-mile area, the total EfW capacity would evidently exceed the amount of general waste in the area *if all the planned EfW sites progress through to completion*. That represents a very large assumption. How plausible is it?

Plant Name	Operator / Developer	Postcode	Capacity (tonnes)	Nearby Town	Output
South Humber Bank Energy Centre	*EPUKI*	*DN41 8DB*	*616,500*	*Grimsby*	*95MWe*
North Beck Energy Centre	*North Beck Energy Ltd*	*DN40 1QN*	*500,000*	*Grimsby*	*49.5MWe*
NU-Energy Incineration Plant	*NU-Energy Ltd*	*DN41 8DT*	*350,000*	*Grimsby*	*20MWe*
Great Coates Energy Incineration Plant	*Great Coates Energy Ltd*	*DN31 2TT*	*226,000*	*Grimsby*	*18MWe*
Southmoor Energy Centre Incineration Plant	Peel Environmental	WF11 8DN	350,000	Knottingley	32.4MWe
Houghton Main Energy Centre	Peel Environmental	S71 5EX	150,000	Barnsley	20MWe

Fig. 6.3 - EfW Sites with Planning Approved Between 26 and 50 Miles From Flixborough

Of the 2.2 million tonnes' EfW capacity with a status of "Planning Approval" in the 26 – 50-mile belt, almost 1.7 million tonnes is sited in or around Grimsby. Geographically, with the river Humber to the North, the North Sea

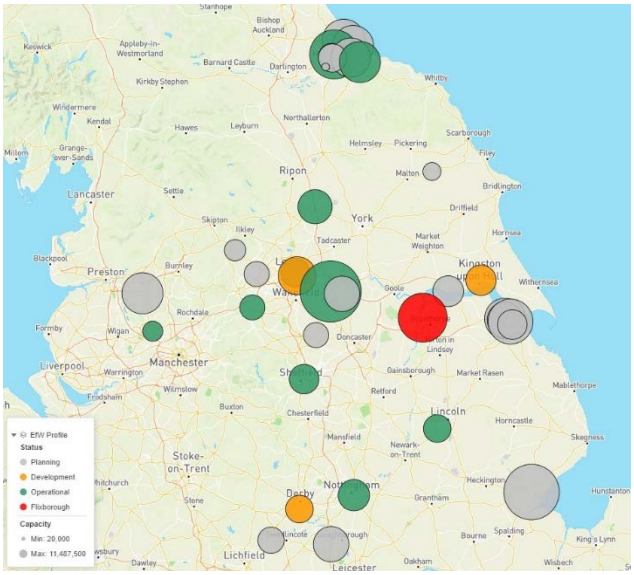


Fig. 6.4 – EfW within 100 miles of Flixborough

to the right and rural Lincolnshire to the South, Grimsby sits at the end of the A180 dual carriageway as a rather isolated outpost. Certainly, Grimsby and Immingham are strategic port locations for trade in and out of the Humber estuary and, as such, have significance in the export of RDF from England to Scandinavia (see Section 7). However, just because RDF passes through Grimsby on its way overseas, that does not mean that it is the location of choice for multiple EfW facilities, any more than Dover would be a logical site to construct a holiday resort simply because lots of cars use the ferry ports on their way to France. No disrespect is aimed at Grimsby, for much investment has been made by Northeast Lincolnshire in enhancing connectivity by road and rail; nonetheless, it is questionable whether the town can support a residual waste demand of 2 million tonnes per year, with almost all of it arriving from outside the area. Fig. 6.4 demonstrates the advantages offered by a Flixborough EfW, within easy each of the Eastern end of the M62 corridor, with access to the M18 – M180 – M181 motorways, as well as the rail and wharfage links.

In the 51 – 75-mile bracket, one key site of note with a status of Planning Approved is the Boston Alternative Energy Facility with a headline capacity of 1 million tonnes. Should that site be approved by the Government (currently in the DCO process as a Nationally Significant Infrastructure Project), the Boston EfW would be the second-largest facility in the UK (behind Runcorn at 1.1 million tonnes) and the 6th largest in Europe / Scandinavia.

The past few years have seen a rise in the volume of waste processed by EfW within the 100-mile radius catchment (see Fig. 6.5), and the 26 – 50-mile belt has witnessed the fastest rise thanks to the development of Ferrybridge FM1 and FM2 with a combined capacity of 1.3 million tonnes.

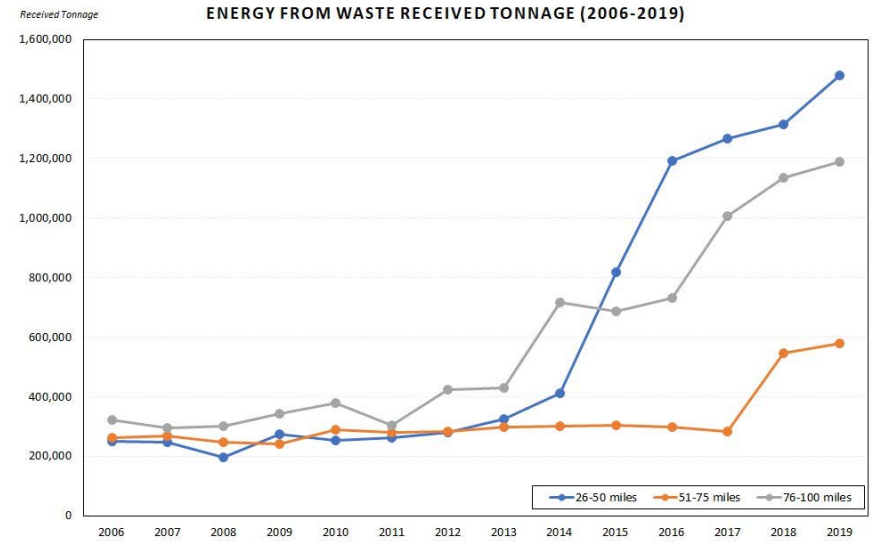


Fig. 6.5 – Energy from Waste Received Tonnage

It might be presumed that, since the 26 – 50-mile band has seen such an advance in EfW development, there may be overcapacity in that tier which may have a negative impact on the availability of feedstock for the envisaged Flixborough development. Is that a risk? Is there still a need for any more EfW capacity in the region?

Fig. 6.6 charts the received tonnage vs the stated headline EfW in the 3 tiers 26-50 miles, 51-75 miles and 75-100 miles (bearing in mind there are no operational EfW sites in the 0 – 25-mile tier). The Ferrybridge FM2 capacity is included in the right-hand blue bar, but since the site opened towards the end of 2019, the information on received tonnage is light and so a predicted value has been allotted to FM2 as a 'top up'. With this adjustment applied, which simply assumes that FM2 is receiving its full share of combustible waste, it is apparent that available capacity in the 26 – 50-mile tier is met by incoming tonnage; indeed, incoming tonnage is slightly more than operational capacity. This is less closely matched in the more distant bands, though it is not necessarily a sensible aspiration

Fig. 6.6 – Received Tonnage vs Headline Capacity

to have no headroom whatsoever in case of fire or other operational incident, or simply scheduled shutdown. Therefore, rather than Fig. 6.6 suggesting that there are too many EfW sites in the 51-100 mile belt, it portrays a message that those areas are possibly about right, whereas the region closer to Flixborough is in need of additional capacity.

6.2 FERRYBRIDGE MULTIFUEL PLANT (WF11 8DX AND WF11 8SQ)

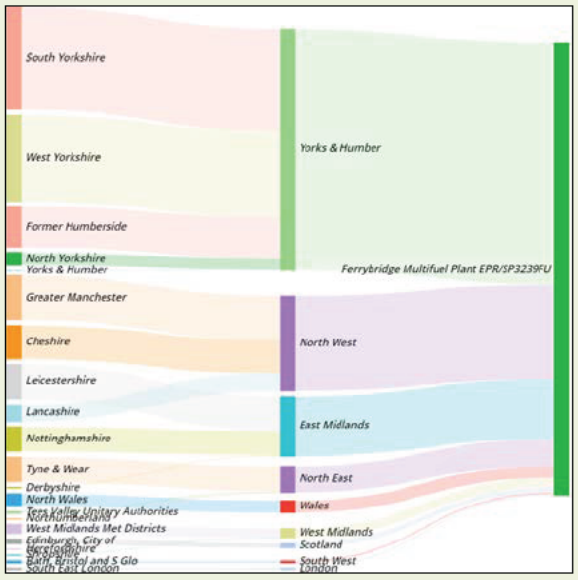


Fig. 6.7 - Ferrybridge Multifuel Plant (FM1 & FM2 combined)

Ferrybridge MFE Ltd	***Tonnage:***
South Yorkshire	180,619
West Yorkshire	151,598
Greater Manchester	78,091
Former Humberside	72,522
Leicestershire	61,050
Cheshire	58,664
Tyne & Wear	44,078
Nottinghamshire	42,583
Lancashire	30,537
North Wales	21,721
Others	54,153
TOTAL:	***795,616***

The first 68MWe Ferrybridge Multifuel plant was fully commissioned in July 2015 on land adjacent to the coal-fired power station (Ferrybridge C, now redundant). Just over half of the feedstock received by the Ferrybridge Multifuel sites came from the Yorkshire & Humber region, with around 200,000 tonnes alone provided by Renewi in a 20-year supply contract, from their Wakefield, Barnsley, Doncaster & Rotherham (BDR) and Derby facilities [10]. There are also supply contracts with Associated Waste Management [11] in Leeds / Bradford and Ellgia [12] in Scunthorpe. This merchant EfW is well-placed, being geographically central and enjoying easy access to both the M62 (East-West) and M1 (North-South). There is also rail siding to the plant.

10 [redacted]
11
12

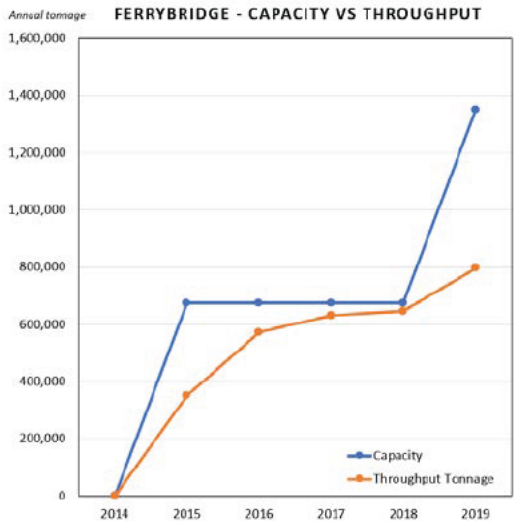


Fig. 6.8 – Ferrybridge Sites – Capacity vs Throughput

Fig. 6.8 demonstrates that sufficient tonnage has been secured to fill the FM1 plant, with FM2 receiving additional tonnage in its first year of operation (2019).

Ferrybridge Multifuel receives only two waste codes, these being 19 12 10 (80%) and 19 12 12 (20%). The sites produced just over 150,000 tonnes of bottom ash in 2019 which was recovered in South and West Yorkshire.

6.3 FCC WASTE SERVICES (UK) LTD (LN6 3QZ) – LINCOLN EFW

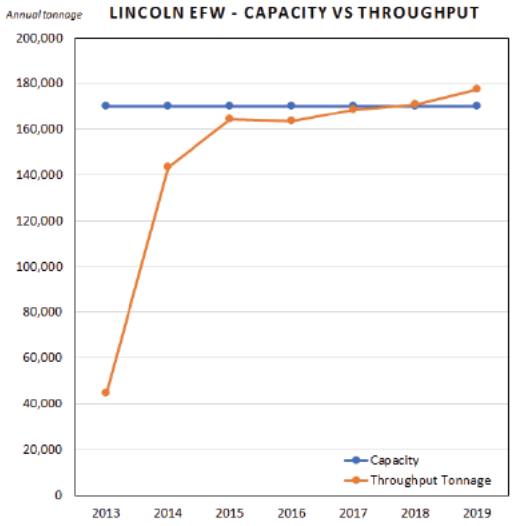
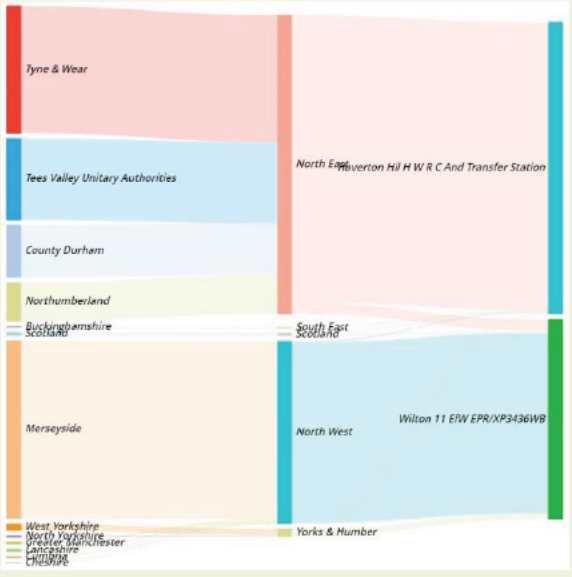


Fig. 6.9 - Lincoln EfW – Capacity vs Throughput

Records from WasteDataFlow, the information portal for Local-Authority-collected waste, show that in 2019, 166,000 tonnes of Lincolnshire LA waste was sent to the Lincoln EfW. In other words, this facility is primarily a contractual outlet for council waste management rather than a merchant facility for commercial and industrial waste arisings (although some businesses will make use of the council trade waste collection services).

Fig. 6.9 demonstrates that the facility is running at or just over its technical capacity, with little headroom for additional commercial waste streams if the council input is 166,000 tonnes.

6.4 SUEZ NORTH EAST (HAVERTON HILL TS23 1PY AND WILTON 11 TS90 8WS)



Suez TS23 & TS90 8WS

	Tonnage:
North East	670,209
North West	408,080
Yorks & Humber	16,638
Scotland	5,874
South East	247
TOTAL:	***1,101,047***

Fig. 6.10 – Suez North East EfW Sites (TS23 1PY / TS90 8WS)

The two EfW sites in the North East are both owned and operated by SUEZ. The Wilton 11 facility was developed to treat waste from Merseyside in the North West; to avoid truck movements and the associated pollution and carbon emissions, SUEZ developed a rail transfer loading station in Knowsley, and the residual waste is transported by train to the Wilton site.

6.5 EFW TONNAGE VS CAPACITY

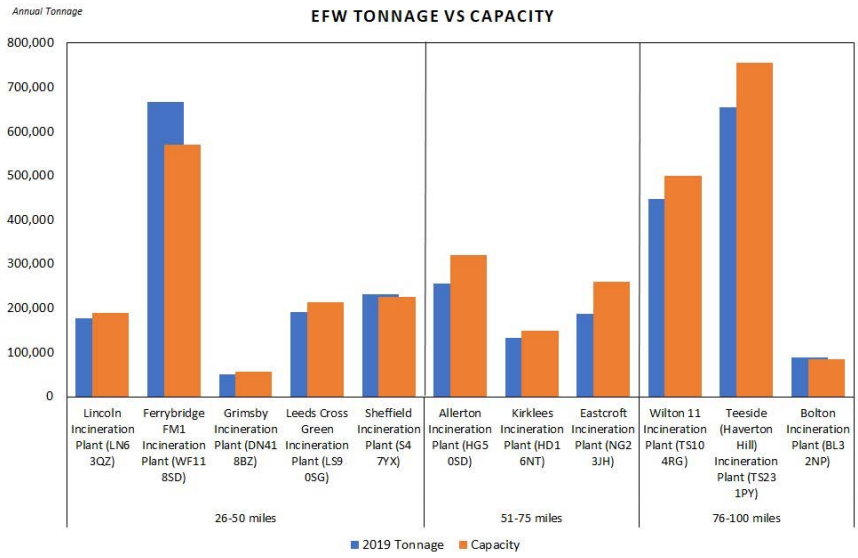


Fig. 6.11 – EfW Tonnage vs Capacity (sites within 100 miles of Flixborough)

Plotting reported received tonnage vs headline capacity for each of the MSW EfW sites within 100 miles of Flixborough, the pressure on processing headroom can be seen, especially in the crucial 0-50 mile catchment (remembering that there are presently no operational sites in the 0-25 area). Ferrybridge FM2 has not been included in Fig. 6.11 because of the incomplete data in 2019, though it appears that FM1 topped its own limit, this presumably being a necessary short-term means of balancing incoming waste while FM2 approached go-live. Thus, Fig. 6.11 should be assessed with supplementary awareness of FM2 (675,000 tonnes) as well as the two sites under development in the 0-50 miles range; Energy Works Hull (240,000 tonnes) and Skelton Grange (410,000 tonnes).

6. RDF EXPORT TRENDS

7.1 OVERVIEW

The RDF export market began in June 2010 after a regulatory decision by the Environment Agency based on the UK Plan for Shipments of Waste, which allowed the shipment of processed MSW-derived fuels. Exported volumes of RDF from England to overseas destinations across mainland Europe and Scandinavia went from zero in June 2010 to just under 3.5 million tonnes (as an annual value) in April 2018. RDF in this context also includes SRF, a higher grade of fuel which is able to be used in cement facilities. SRF is eligible for export beyond the EU / Scandinavia, therefore some shipments have been made to sites in Senegal, Morocco, India and the United States. RDF is restricted by legislation to the EU / Scandinavia zone. The movement of such waste-derived fuels was advantageous and viable both because of the lack of available UK EfW capacity and the rate of landfill tax (which was in the midst of a 'landfill tax escalator' policy whereby the tax rate was increasing by £8 per tonne each year, a regiment that continued until 2015). With rising disposal costs in the UK and few viable domestic alternatives, the production and export of RDF presented an attractive option.

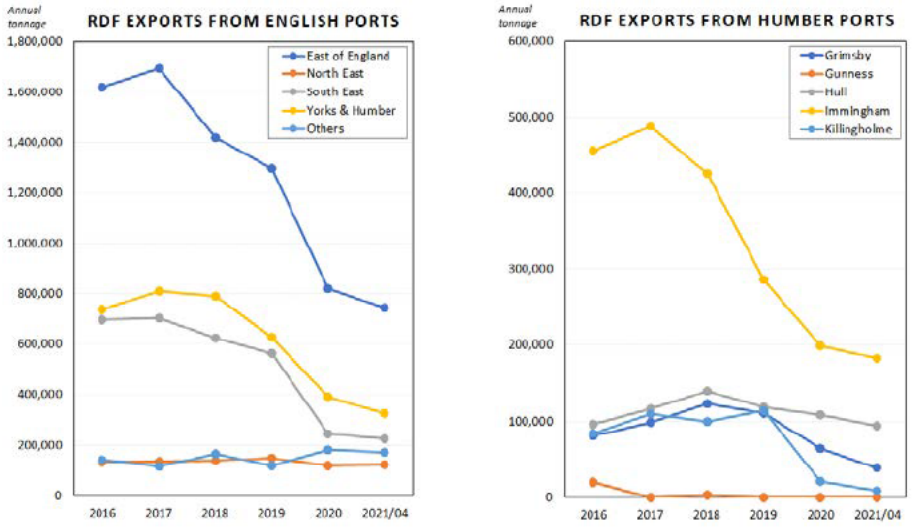


Fig. 7.1 – RDF Export Trends

Exit Port	Tonnage	Rank
Immingham	543,309	1
Dover	531,627	2
Felixstowe	481,554	3
Tilbury	397,625	4
Harwich	323,323	5
Purfleet	315,360	6
Hull	129,566	7
Grimsby	125,593	8
Killingholme	86,650	9
Blyth	81,159	10

Fig. 7.2 - Port Exports 52 wks to April 2018

Export Port	Tonnage	Rank
Felixstowe	201,238	1
Harwich	186,229	2
Immingham	182,684	3
Tilbury	168,919	4
Purfleet	135,275	5
Hull	94,449	6
Boston	87,713	7
Hartlepool	76,665	8
Sheerness	63,887	9
Chatham	60,995	10

Fig. 7.3 - Port Exports 52 wks to April 2021

Throughout the time since 2010, ports in the East of England (such as Felixtowe, Tilbury, Purfleet and Harwich) have collectively maintained pole position, with Humber ports (Immingham, Hull, Grimsby and Killingholme / North Killingholme) in consistent second place (Fig. 7.1). However, the ranking of individual ports show that Immingham has national significance in export volumes, being the number one port in 2018 (Fig. 7.2). By 2021, following the impact of the Coronavirus pandemic and the Waste Import Tax in the Netherlands, Immingham has slipped to third place with a 52-week export volume of just over 180,000 tonnes (Fig. 7.3). Nonetheless, the Humber ports remain of national relevance in the RDF sector, the latest figures showing 325,000 tonnes passing through Humber ports in the past year [13].

RDF broker Geminor is the key operator utilising Humber ports, primarily through Immingham but also some volumes through Hull. Grimsby has been a favoured hub for N&P Alternative Fuels, though they have recently announced their intention to close the Grimsby facility following the opening of their Teesside Subcoal Production site [14]. Fig. 7.4 presents the breakdown of the key export notifiers utilising Humber ports for the shipment of RDF.

[13] *52 weeks to April 2021*

[14] [redacted]

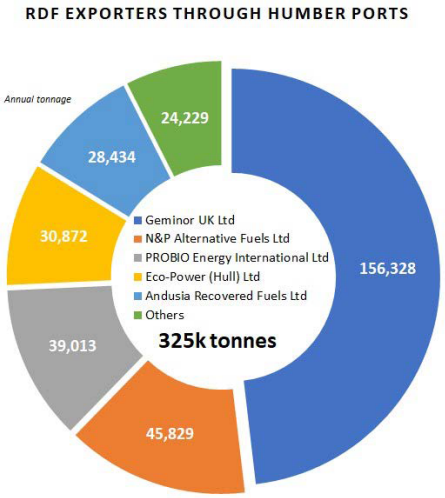


Fig. 7.4 – RDF Exporters Through Humber Ports

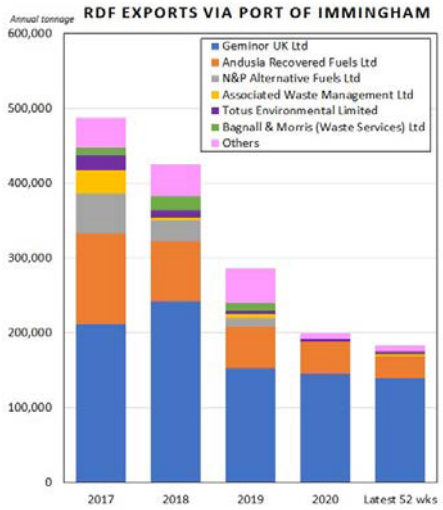


Fig. 7.5 – RDF Exports via Immingham

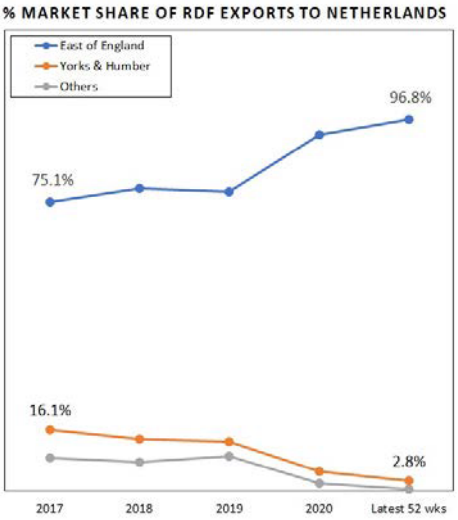


Fig. 7.6 – % Port Share of RDF to Netherlands

The Waste Import Tax of €32 per tonne, implemented by the Dutch parliament in January 2020, has caused a significant shift in export traffic. The tax had the immediate effect of undermining the commercial viability of exporting RDF to the Netherlands, and the most obvious way of being able to honour long-term supply commitments between notifiers and consignees was to reduce 'sea miles' by transferring exports to the Netherlands away from the Humber to the East of England ports. Those ports now account for almost 97% of RDF volumes sent from England to the Netherlands (Fig. 17.6).

For the Humber ports, the Scandinavian routes offer the greater geographical advantage, with Immingham-Gothenburg and Immingham-Fredrikstad being key routes to Sweden and Norway respectively.

As waste production increases following the Coronavirus pandemic – either when it ends or as we learn to live with it – it is plausible that RDF exports through Humber ports might be expected to rise and stabilise at around 400,000 tonnes per year. Even so, there appears to be a growing appetite for RDF import taxes, with the Netherlands joined by Sweden and Norway in taxing imported waste fuels. Denmark is likewise considering applying a tax, seeking to target the plastic proportion of incinerated waste rather than simply the application of a blunt levy. Such moves, whether done in isolation by individual nation states (as now) or as a coordinated pan-European waste carbon tax (which may be the ultimate outcome), will put further pressure on RDF exports which, in turn, will mean the UK will need to retain more of its own waste rather than relying on exports as an overflow outlet route.

7. ZONE A [0-25 MILES: YORKSHIRE & HUMBER]

GEOGRAPHY: *This zone encompasses primarily North Lincolnshire and East Yorkshire on either side of the River Humber, also with some portions of South Yorkshire and North Yorkshire.*

8.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE A	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	849,823	29,500	777,405	191,023	1,847,751
Percentage	**46.0%**	1.6%	42.1%	10.3%	100%

Transfer
661,472

INFRASTRUCTURE: *Within Zone A, landfill represents the main option for non-recyclable residual waste, the primary site being Biffa Waste Services (DN15 0BD) in North Lincolnshire. Most of the MRF / processing capacity lies on the north Humber Bank in Hull and East Yorkshire, this being the more populous urban area. The Biffa landfill position is favourable more on the basis of easy logistical access rather than urban density in the immediate surroundings.*

8.2 KEY OPERATORS IN ZONE: OVERVIEW

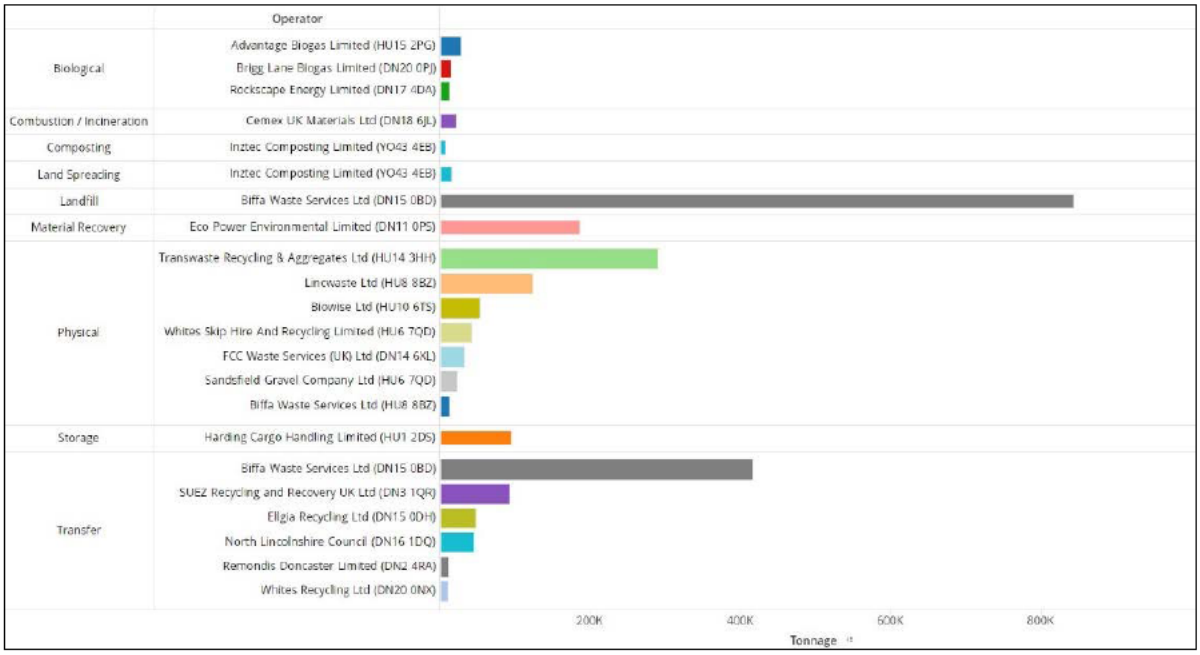


Fig. 8.1 – Zone A Site Overview

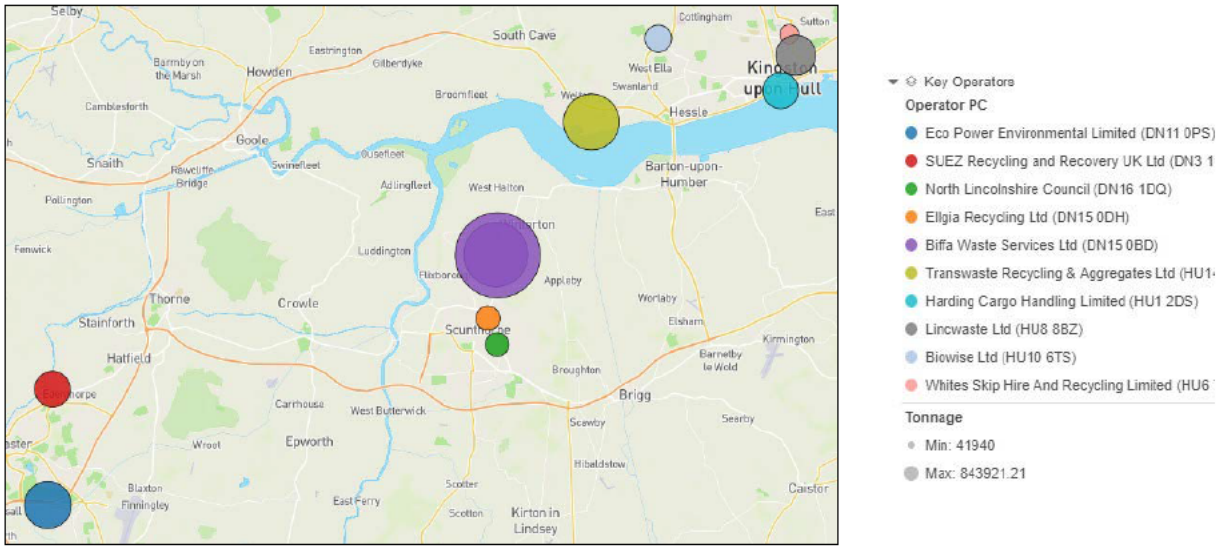
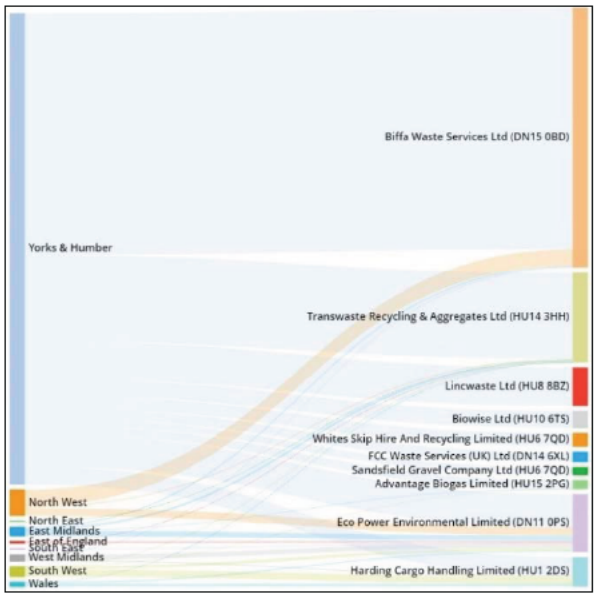


Fig. 8.2 – Zone A Key Operators Map

8.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 8.3 – Zone A Origin Region To Operators (Exc. Transfer Stations)

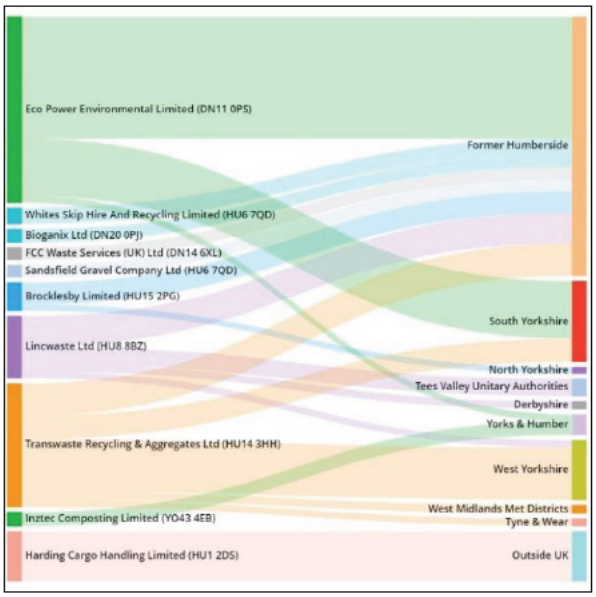
Waste Incoming To Sites In Zone



Biffa Waste Services Ltd (DN15 0BD):	843,917 tonnes
Transwaste Recycling & Aggregates Ltd (HU14 3HH):	290,640 tonnes
Lincwaste Ltd (HU8 8BZ):	122,801 tonnes
Biowise Ltd (HU10 6TS):	53,417 tonnes
Whites Skip Hire And Recycling Ltd (HU6 7QD):	41,940 tonnes
FCC Waste Services (UK) Ltd (DN14 6XL):	32,229 tonnes
Sandsfield Gravel Company Ltd (HU6 7QD):	23,085 tonnes
Advantage Biogas Ltd (HU15 2PG):	27,785 tonnes
Eco Power Environmental Ltd (DN11 0PS):	185,877 tonnes
Harding Cargo Handling Ltd (HU1 2DS):	94,516 tonnes

Top 10: 1,716,207 tonnes *(out of total 1,847,751 tonnes)* [15]

Waste Outgoing From Sites In Zone



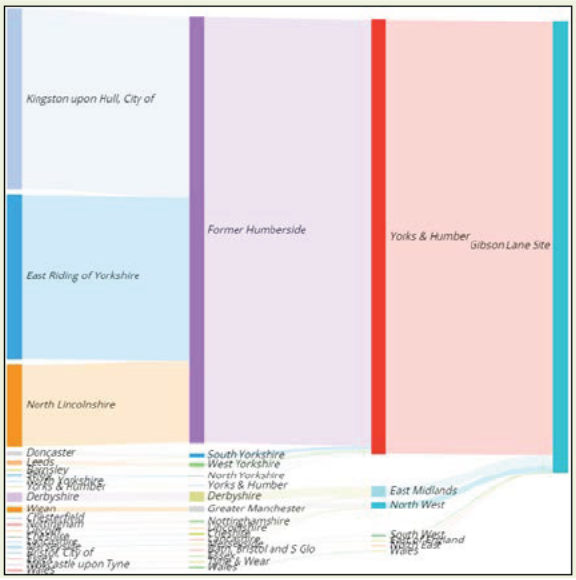
Former Humberside:	549,010 tonnes
South Yorkshire:	162,862 tonnes
North Yorkshire:	12,856 tonnes
Tees Valley Unitary Authorities:	54,795 tonnes
Derbyshire:	15,664 tonnes
Yorks & Humber:	46,925 tonnes
West Yorkshire:	117,836 tonnes
West Midlands Met Districts:	25,184 tonnes
Tyne & Wear:	13,474 tonnes
Outside UK:	107,286 tonnes

Top 10: 1,105,892 tonnes *(out of total 1,152,304 tonnes)*

8.4 KEY OPERATORS IN ZONE: INSIGHT

8.4.1 Transwaste Recycling & Aggregates (HU14 3HH)

Fig. 8.4 - Transwaste Recycling & Aggregates (HU14 3HH)



GIBSON LANE SITE:

	Tonnage:
Kingston upon Hull:	116,099
East Riding:	105,883
North Lincolnshire:	53,154
Others:	15,000
TOTAL:	***290,657***

Transwaste Recycling & Aggregates Ltd in East Yorkshire provides skip hire and waste sorting / recycling services at a MRF with a licence to process over 750,000 tonnes per annum. Transwaste was acquired by Eco Power Environmental Ltd in 2018. As well as their main MRF on Gibson Lane, they have a smaller site on Foster Street in Hull; the combined incoming general waste to these two sites since 2016 has been around the level of 275,000-300,000 tonnes per annum (see Fig. 8.5).

[15] *"Total" being the tonnage of incoming waste within the identified zone, in the list of general waste codes in Section 3.1, excluding Transfer Stations.*

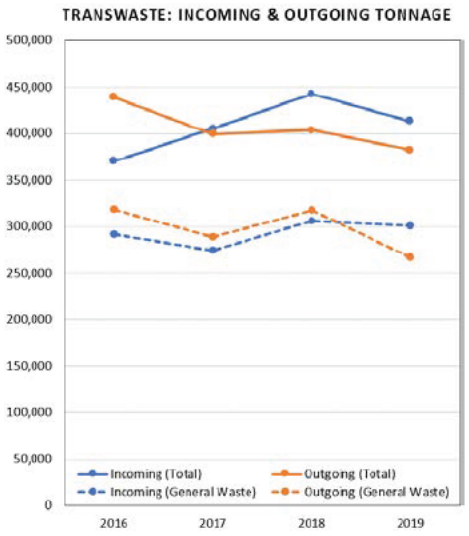


Fig. 8.5 – Transwaste tonnage

Transwaste have the capability and experience to produce baled & wrapped RDF to the required specification; between 2011 and 2016, they exported RDF (primarily to Germany) under their own TFS notification. Since then, they have been making use of EfW capacity in the Yorkshire region (East Yorks and West Yorks), but also a sizeable volume of general waste is being sent to landfill (2016: 152k, 2017: 111k, 2018: 135k, 2019: 146k) as EWC 19 12 12.

8.4.2 Eco Power Environmental Ltd (DN11 0PS)

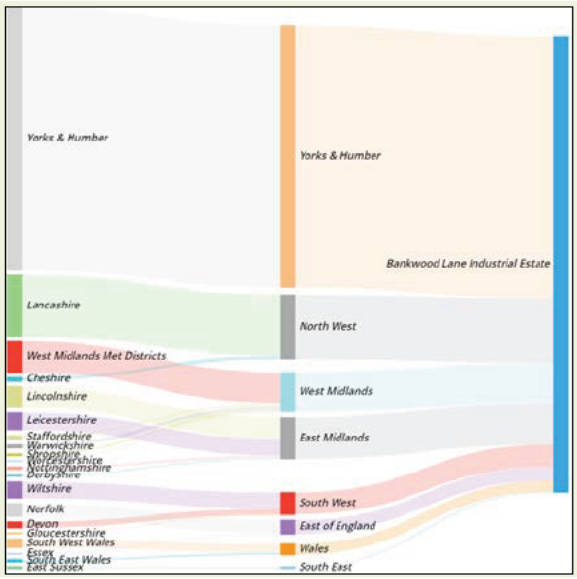


Fig. 8.6 – Eco Power Environmental Ltd (DN11 0PS)

Eco Power Environmental (DN11 0PS)	
	Tonnage:
Yorks & Humber	106,953
North West	26,196
West Midlands	16,260
East Midlands	16,982
South West	9,085
East of England	5,622
Wales	4,545
South East	234
TOTAL:	***185,877***

From the company website[16]: "Our flagship facilities in Yorkshire and Humber provide recycling and fuel production services for commercial and municipal waste from across the UK. Both facilities also benefit from on-site rail links providing a highly cost-effective transport option for large volumes of waste, recovered materials and our alternative fuel products."

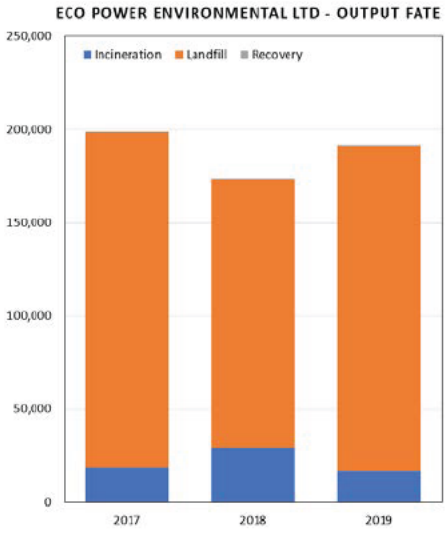


Fig. 8.7 – Eco Power Ltd - Output Fate

Fig. 8.6 certainly affirms the geographical breadth of Eco Power's feedstock sourcing, with around half received from Yorkshire & Humber, the other half originating in the North West, West Midlands, East Midlands and further afield. The site licence permits the company to handle a maximum of 200,000 tonnes per annum. Across 2016-2019 inclusive, the recorded annual site receipts have averaged at 198,000 tonnes, with around 90% of this incoming feedstock coded as 19 12 12. Curiously, the registered output from the site for 2017, 2018 and 2019 approaches 400,000 tonnes in each year, suggesting that twice as much material leaves the site as arrives. This is likely to be a reporting error on the part of the company (although for them to make such an error for three consecutive years is somewhat baffling). Overall, the business model appears to be to receive low-grade feedstock as 19 12 12 and carry out further separation using trommels, screens, magnets & eddy current separators, ballistic separators and Near Infrared technology (these technologies are as listed on their website). The website also states that they divert over 95% of the material

16 [redacted]

processed through their facilities from landfill. Given the aforementioned oddity with their output data, if we assume that the company's *outgoing* figures have simply been accidentally double-entered or double-reported to the EA, halving them leads us to the scenario displayed in Fig. 8.7, where most of the tonnage leaving the Eco Power Environmental facility heads to landfill, contradicting their website assertion.

8.4.3 Lincwaste Ltd (HU8 8BZ)

Lincwaste is a subsidiary entity of FCC Environment (UK) Ltd. The HU8 8BZ site receives material (almost entirely general waste categorised as 20 03 01 'Mixed Municipal Waste') from the Hull and East Riding area, suggesting this is a municipal waste site to service the contract between FCC and Hull and East Riding Councils.

Material outgoing from the site (which is mainly 20 03 01) goes to transfer stations across Yorkshire & Humber, the North East and East Midlands, presumably these being other FCC sites.

8. ZONE B [0-25 MILES: EAST MIDLANDS]

GEOGRAPHY: *This small zone encompasses the northern edge of Lincolnshire and Nottinghamshire. This is a rural area and consequently, tonnages are low.*

9.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE B	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	16,673	0	0	5,742	22,415
Percentage	74.4%	0.0%	0.0%	25.6%	100%

Transfer
23,497

INFRASTRUCTURE: *In terms of permitted waste sites, this accounts for a handful of operators between Gainsborough and Market Rasen. There is a very small landfill*

9.2 KEY OPERATORS IN ZONE: OVERVIEW

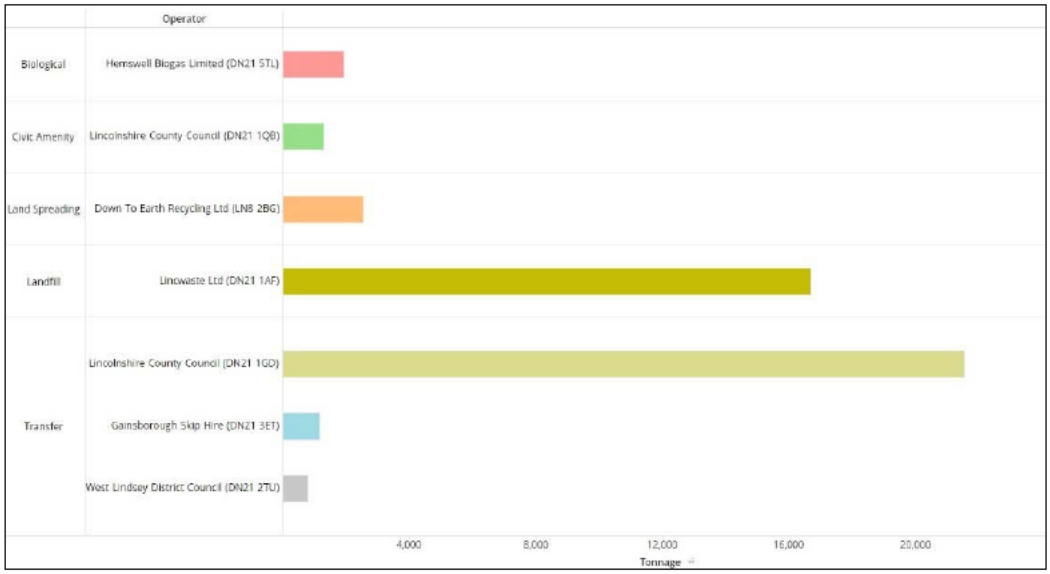


Fig. 9.1 – Zone B Site Overview

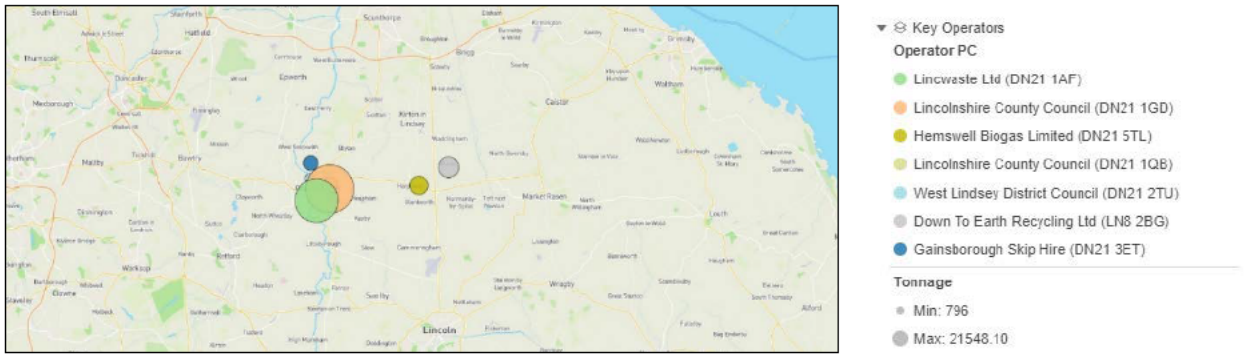
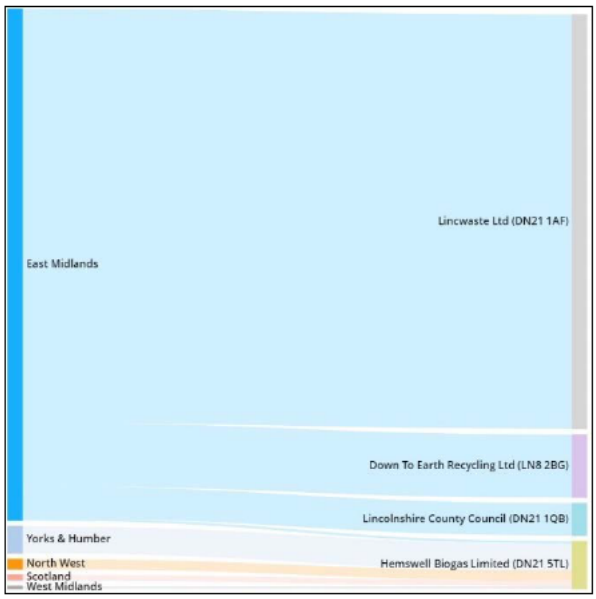


Fig. 9.2 – Zone B Key Operators Map

9.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 9.3 – Zone B Origin Region To Operators (Excludes Transfer Stations)

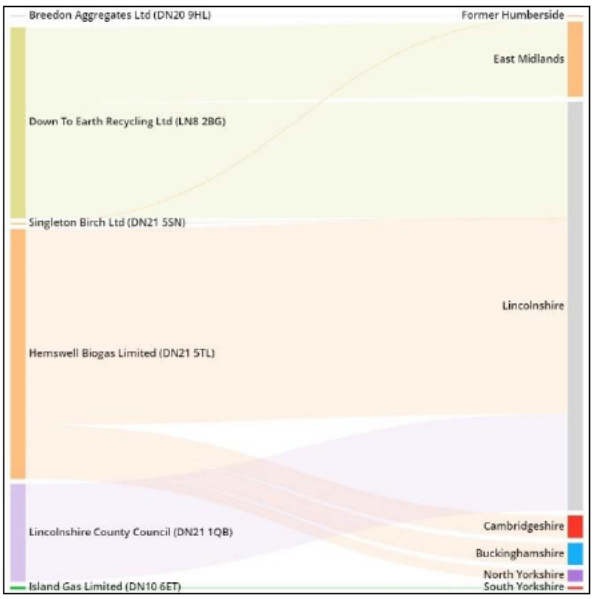
Waste Incoming To Sites In Zone



Lincwaste Ltd (DN21 1AF):	16,673 tonnes
Down To Earth Recycling (LN8 2BG):	2,538 tonnes
Lincolnshire County Council (DN21 1QB):	1,289 tonnes
Hemswell Biogas Ltd (DN21 5TL):	1,915 tonnes

Top 4: 22,415 tonnes *(out of total 22,415 tonnes)*

Waste Outgoing From Sites In Zone



Former Humberside:	3 tonnes
East Midlands:	996 tonnes
Lincolnshire:	5,435 tonnes
Cambridgeshire:	291 tonnes
Buckinghamshire:	282 tonnes
North Yorkshire:	145 tonnes
South Yorkshire:	25 tonnes

Top 7: 7,177 tonnes *(out of total 7,177 tonnes)*

9. ZONE C [26-50 MILES: YORKSHIRE & HUMBER]

GEOGRAPHY: *This zone includes a couple of RDF transfer stations in Immingham / Grimsby to the East, as well as a number of key operators from Sheffield to Leeds, to the West of Flixborough.*

10.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE C	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	451,093	1,218,882	702,120	392,039	2,764,134
Percentage	16.3%	44.1%	25.4%	14.2%	100%

Transfer
1,157,672

INFRASTRUCTURE: *Zone C incorporates numerous EfW sites, such as the municipal-focused facilities in Sheffield, Leeds and Grimsby, along with the Ferrybridge Multifuel plants. Note that the second Ferrybridge plant was only made operational at the very end of 2019 and so reported tonnages are lower than the current throughput.*

10.2 KEY OPERATORS IN ZONE: OVERVIEW

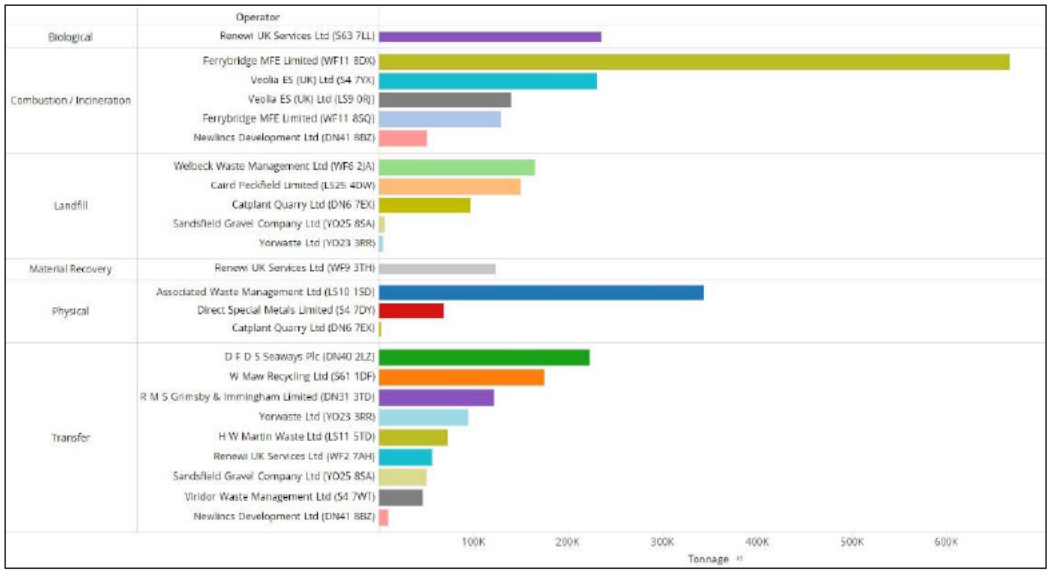


Fig.10.1 – Zone C Site Overview

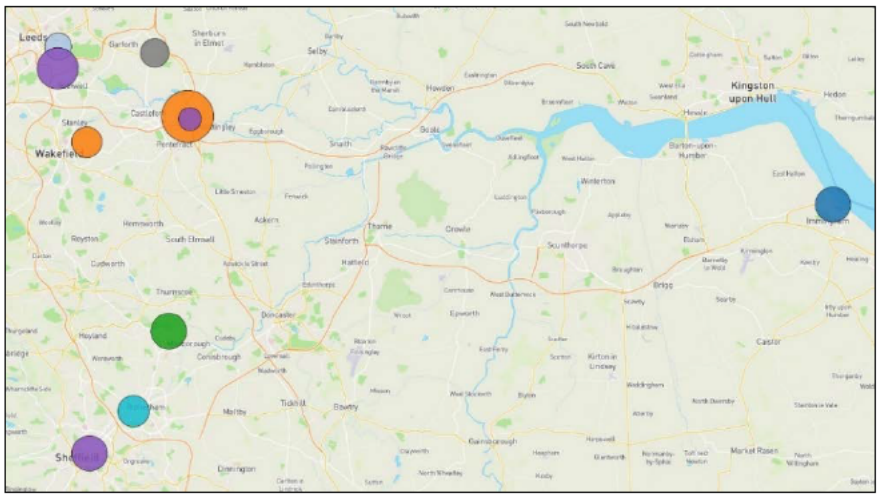
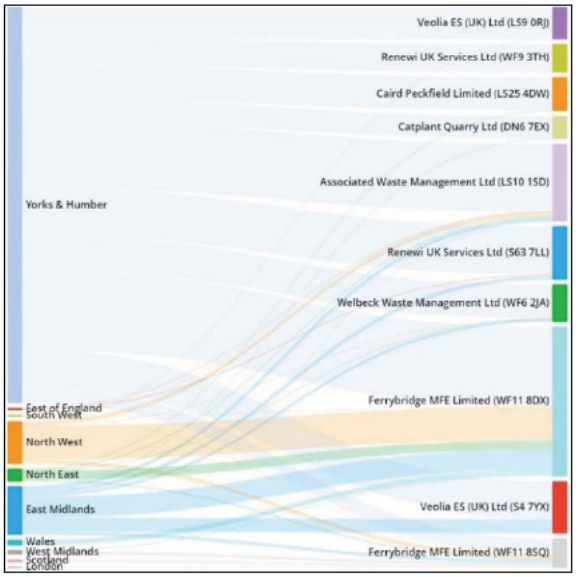


Fig. 10.2 – Zone C Key Operators Map

10.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 10.3 – Zone C Origin Region To Operators (Excludes Transfer Stations)

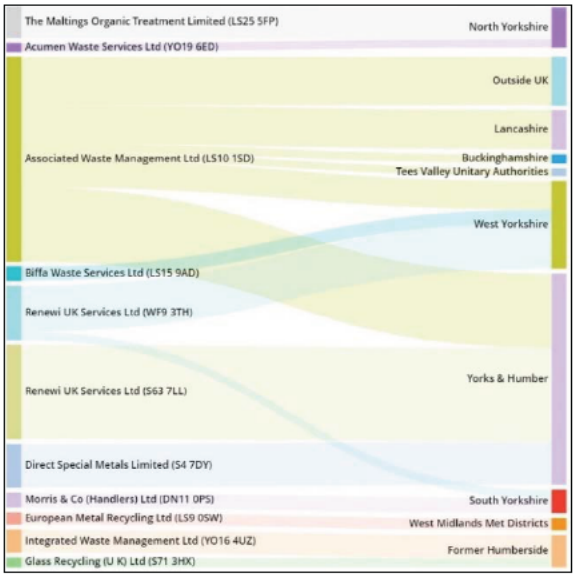
Waste Incoming To Sites In Zone



Veolia ES (UK) Ltd (LS9 0RJ):	140,153 tonnes
Renewi UK Services Ltd (WF9 3TH):	122,951 tonnes
Caird Peckfield Ltd (LS25 4DW):	149,950 tonnes
Catplant Quarry (DN6 7EX):	99,936 tonnes
Associated Waste Management Ltd (LS10 1SD):	344,016 tonnes
Renewi UK Services Ltd (S63 7LL):	235,099 tonnes
Welbeck Waste Management Ltd (WF6 2JA):	165,006 tonnes
Ferrybridge MFE Limited (WF11 8DX):	666,393 tonnes
Veolia ES (UK) Ltd (S4 7YX):	230,553 tonnes
Ferrybridge MFE Limited (WF11 8SQ):	129,223 tonnes

Top 10: 2,283,280 tonnes *(out of total 2,765,134 tonnes)*

Waste Outgoing From Sites In Zone



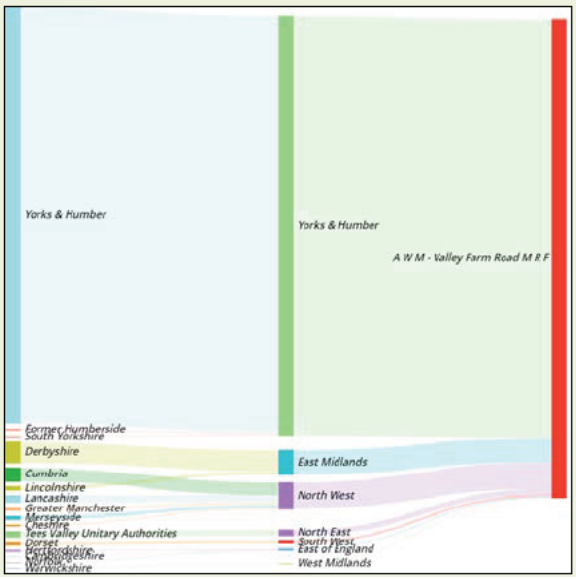
North Yorkshire:	79,363 tonnes
Outside UK:	80,425 tonnes
Lancashire:	60,264 tonnes
Buckinghamshire:	12,333 tonnes
Tees Valley Unitary Authorities:	19,443 tonnes
West Yorkshire:	156,592 tonnes
Yorks & Humber:	335,850 tonnes
South Yorkshire:	89,582 tonnes
West Midlands Met Districts:	19,371 tonnes
Former Humberside:	79,704 tonnes

Top 10: 932,927 tonnes *(out of total 973,649 tonnes)*

10.4 KEY OPERATORS IN ZONE: INSIGHT

10.4.1 Associated Waste Management (LS10 1SD)

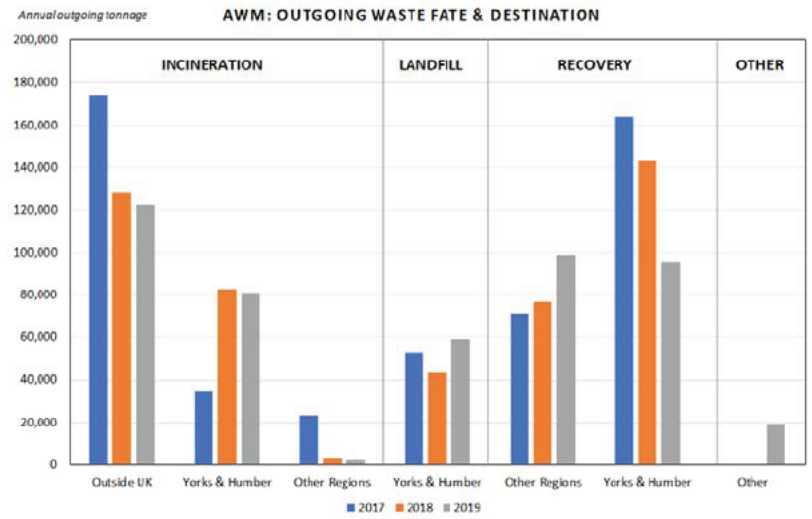
Fig. 10.4 – Associated Waste Management (LD10 1SD)



Valley Farm Road MRF

	Tonnage:
Yorks & Humber	299,391
Derbyshire	14,625
Cumbria	9,204
Lancashire	4,752
Tees Valley Un y Authorities	4,001
Lincolnshire	2,507
Merseyside	2,274
Greater Manchester	2,134
Others	5,128
TOTAL:	***344,016***

Fig. 10.5 – AWM Outgoing Waste Fate & Destination



Associated Waste Management (AWM) Valley Road MRF was officially opened in February 2017 with an initial processing capacity of 250,000 tonnes, this being expanded to 400,000 tonnes in a permit variation in 2019. This extra throughput appears to be diversion from other facilities (such as a site in Shipley which was closed in 2017) and resource management rather than organic growth; total tonnage incoming to AWM has remained around the 650,000 tonnes level (550,000 tonnes if filtered for the suitable EWC code selection). The Valley Road MRF is the largest facility in the AWM portfolio.

85% of the feedstock to AWM sites (collectively) comes from Yorkshire & Humber, and the Valley Road MRF has a similar percentage. This Yorkshire & Humber percentage has reduced from 2016 when it was 94% (2016: 94%, 2017: 92%, 2018: 87%, 2019: 85%), with a widening of the feedstock catchment area into the North West and East Midlands.

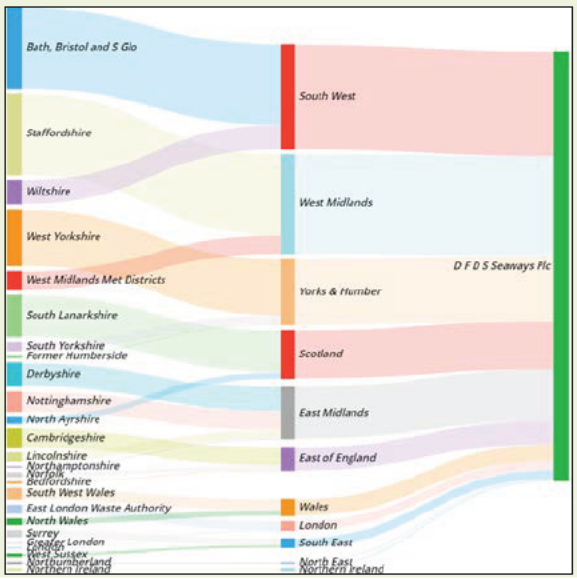
Fig. 10.5 displays the fate and regional profile of general waste material outgoing from the AWM sites. The company has been sending RDF overseas for energy recovery, both under its own TFS and via brokers, although this volume has diminished with the increased availability of EfW capacity in West Yorkshire.

In 2018, AWM was acquired by Irish-owned Beauparc Group [17] who also own New Earth Solutions and Mid UK. All of these companies have expertise in the production and export of RDF to a specification.

AWM also announced a supply deal with the Skelton Grange EfW (planning approved) in January 2021 [18]. Skelton Grange will form part of the Multifuel Energy portfolio which includes the Ferrybridge sites and Kemsley in Sittingbourne, Kent. Multifuel Energy and Wheelabrator UK merged in June 2021 to become 'enfinium'. [19]

10.4.2 DFDS Seaways plc (DN40 2LZ)

Fig. 10.6 – DFDS Seaways plc (DN40 2LZ)



DFDS Seaways plc	Tonnage:
South West	54,025
West Midlands	51,622
Yorks & Humber	34,343
Scotland	24,885
East Midlands	26,768
East of England	12,115
Wales	8,579
London	4,755
South East	4,787
North East	834
Northern Ireland	203
TOTAL:	**222,916**

This site is designated as a Transfer Station; it is in Immingham Docks and is, in effect, a storage and bulking warehouse for RDF prior to export. It is highly unlikely that any processing of the fuel takes place here; the RDF will arrive baled, wrapped and ready for shipping. Since this is a Transfer Station, a note of caution about the data, remembering that material received here has already been recorded elsewhere

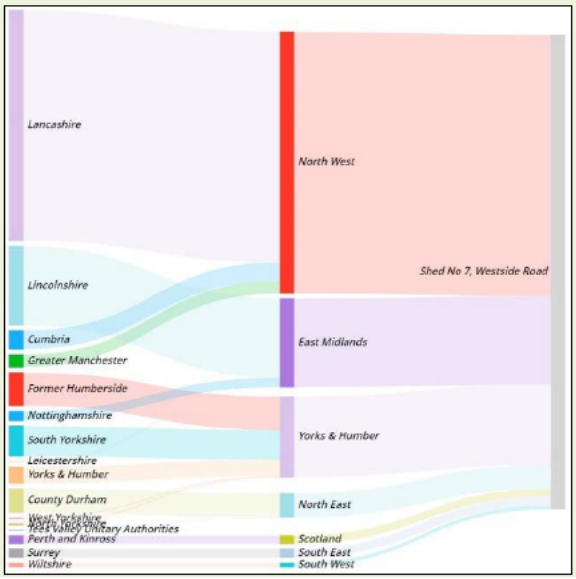
17 [redacted]
18
19

at a MRF or other processing site. For instance, some of the volume from West Yorkshire in the flow diagram Fig. 10.6 may have come from Associated Waste Management. However, it is apparent from the diagram above that the RDF is arriving from across the UK, much of it beyond 100 miles from Flixborough, so the risks associated with double-counting are minimal. Certainly, in 2019, almost 223,000 tonnes of RDF left England through the DFDS Seaways operation.

10.4.3 RMS Grimsby & Immingham (DN31 3TD)

Along the same lines as the DFDS Seaways site, RMS Grimsby & Immingham is a bulk storage facility for RDF awaiting shipment. And, as with DFDS Seaways, most of the incoming RDF originated from outside Yorkshire & Humber (Fig. 10.7). These two shipment-related sites and their combined tonnage of almost 350,000 tonnes convey the message that RDF will travel if there is a commercially-viable outlet with good logistical connectivity. Combine that with the findings from the Ferrybridge facilities where incoming RDF had also been sourced from a wide catchment, it does not appear to make much difference whether the EfW is a merchant facility in the UK or overseas, the primary requirement of waste processors is an outlet that is within reach with a viable gate fee.

Fig. 10.7 – RMS Grimsby & Immingham (DN31 3TD)



RMS Grimsby & Immingham Ltd (DN31 3TD)

	Tonnage:
North West	67,201
East Midlands	22,729
Yorks & Humber	20,672
North East	6,103
Scotland	1,983
South East	2,260
South West	947
TOTAL:	**121,895**

10. ZONE D [26-50 MILES: EAST MIDLANDS]

GEOGRAPHY: *This zone extends into central Lincolnshire, incorporating the Northern ends of Nottinghamshire and Derbyshire. Key locations in this zone include Lincoln, Newark, Worksop and Louth, none of these being very populous towns or cities (Lincoln itself has an urban population of less than 200,000).*

11.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE D	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	137,055	174,031	73,081	29,461	413,628
Percentage	33.1%	42.1%	17.7%	7.1%	100%

Transfer
109,154

INFRASTRUCTURE: *The waste management infrastructure of Zone D is dominated by the Lincoln EfW site which opened in 2014 and the Viridor 'Erin' landfill near Chesterfield.*

11.2 KEY OPERATORS IN ZONE: OVERVIEW

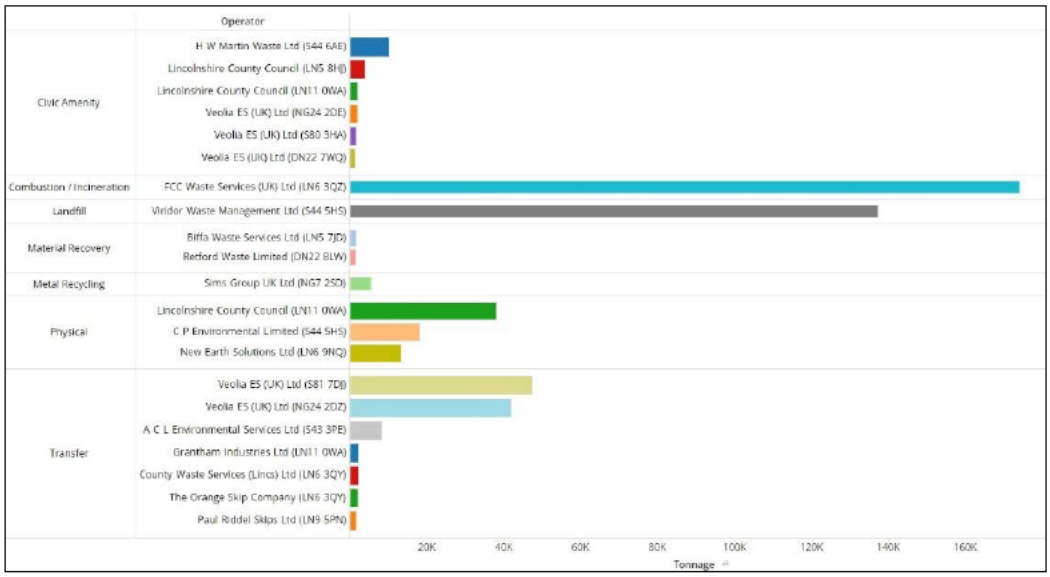


Fig. 11.1 – Zone D Site Overview

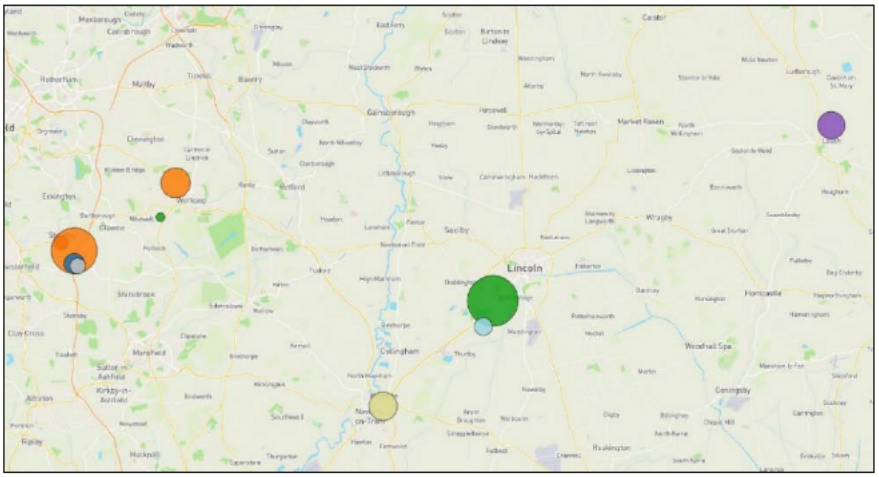
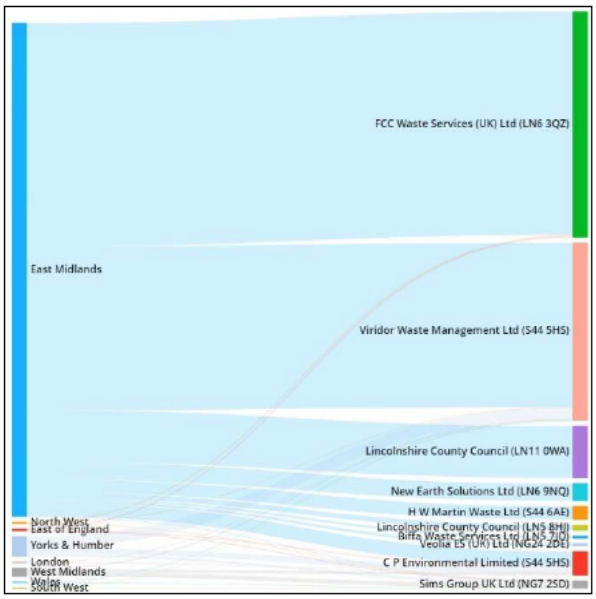


Fig. 11.2 – Zone D Key Operators Map

11.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig.11.3 – Zone D Origin Region To Operators (Excludes Transfer Stations)

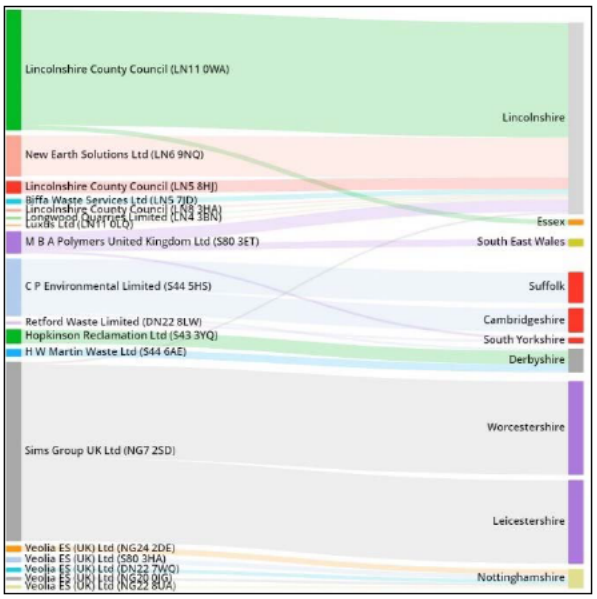
Waste Incoming To Sites In Zone



FCC Waste Services (UK) Ltd (LN6 3QZ):	174,031 tonnes
Viridor Waste Management Ltd (S44 5HS):	137,055 tonnes
Lincolnshire County Council (LN11 0WA):	39,935 tonnes
New Earth Solutions Ltd (LN6 9NQ):	13,327 tonnes
HW Martin Waste Ltd (S44 6AE):	10,101 tonnes
Lincolnshire County Council (LN5 8HJ):	3,901 tonnes
Biffa Waste Services Ltd (LN5 7JD):	1,636 tonnes
Veolia ES (UK) Ltd (NG24 2DE):	1,902 tonnes
CP Environmental Ltd (S44 5HS):	18,094 tonnes
Sims Group UK LTd (NG7 2SD):	5,537 tonnes

Top 10: 405,519 tonnes *(out of total 413,628 tonnes)*

Waste Outgoing From Sites In Zone



Lincolnshire:	63,739 tonnes
Essex:	1,630 tonnes
South East Wales:	2,306 tonnes
Suffolk:	10,204 tonnes
Cambridgeshire:	7,856 tonnes
South Yorkshire:	2,162 tonnes
Derbyshire:	8,042 tonnes
Worcestershire:	30,980 tonnes
Leicestershire:	27,795 tonnes
Nottinghamshire:	6,804 tonnes

Top 10: 161,518 tonnes *(out of total 162,989 tonnes)*

11. ZONE E [51-75 MILES: YORKSHIRE & HUMBER]

GEOGRAPHY: *This zone covers the metropolitan area West and Southwest of Leeds, which includes Bradford, Halifax, Mirfield, Huddersfield and Dewsbury.*

12.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE E	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	0	392,507	276,894	236,208	905,609
Percentage	0.0%	43.3%	30.6%	26.1%	100%

Transfer
550,936

INFRASTRUCTURE: *The largest facility in this zone is the Amey incinerator near Harrogate. Feedstock for that site is predominantly (96%) from Yorkshire & Humber, with Local Authority collections accounting for 171,000 tonnes. Headline capacity for this site is 320,000 tonnes, but it has only received around 250,000 tonnes in 2018 and 2019. Some volumes have reached the site from fair distances, such as 4,500 tonnes from the East Midlands and 3,400 tonnes from the South East. The incinerator is well-located for the A1(M) North-South but more difficult for East-West trade. There are no rail links either, and so the geographical context may explain the below-capacity throughout.*

12.2 KEY OPERATORS IN ZONE: OVERVIEW

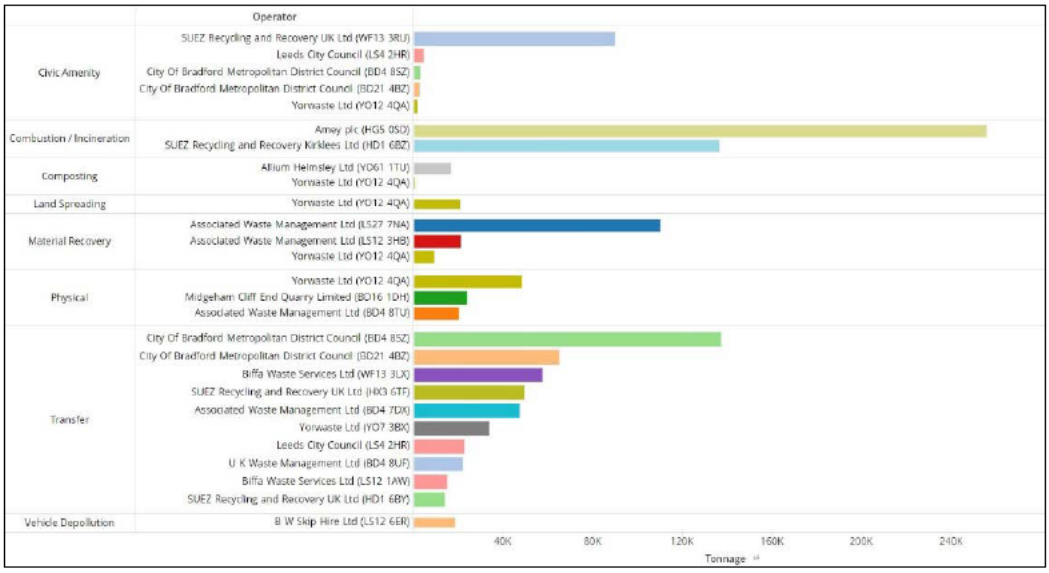


Fig. 12.1 – Zone E Site Overview

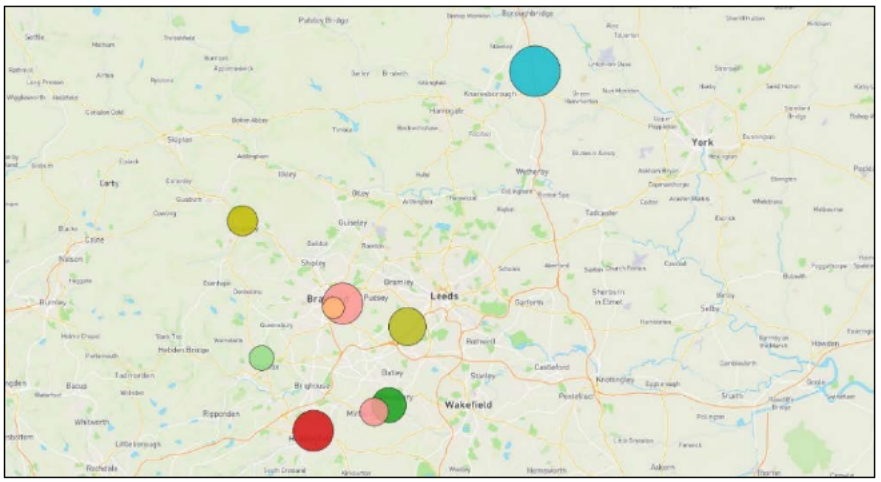
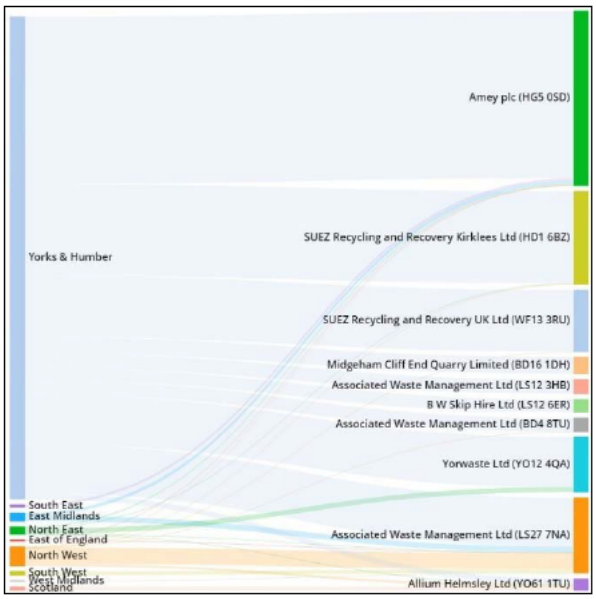


Fig. 12.2 – Zone E Key Operators Map

12.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 12.3 – Zone E Origin Region To Operators (Excludes Transfer Stations)

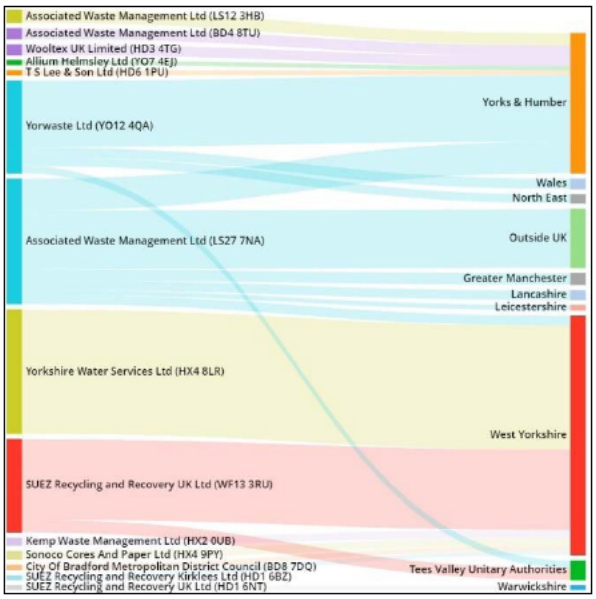
Waste Incoming To Sites In Zone



Amey plc (HG5 0SD):	255,933 tonnes
SUEZ Recycling & Recovery Kirklees Ltd (HD1 6BZ):	136,574 tonnes
SUEZ Recycling and Recovery UK Ltd (WF13 3RU):	90,104 tonnes
Midgeham Cliff End Quarry Ltd (BD16 1DH):	24,163 tonnes
Associated Waste Management Ltd (LS12 3HB):	21,112 tonnes
BW Skip Hire (LS12 6ER):	18,609 tonnes
Associated Waste Management Ltd (BD4 8TU):	20,120 tonnes
Yorwaste Ltd (YO12 4QA):	80,573 tonnes
Associated Waste Management Ltd (LS27 7NA):	110,309 tonnes
Allium Helmsley Ltd (YO61 1TU):	16,629 tonnes

Top 10: 774,126 tonnes *(out of total 905,609 tonnes)*

Waste Outgoing From Sites In Zone



Yorks & Humber:	128,104 tonnes
Wales:	8,468 tonnes
North East:	8,654 tonnes
Outside UK:	50,213 tonnes
Greater Manchester:	11,255 tonnes
Lancashire:	10,606 tonnes
Leicestershire:	4,110 tonnes
West Yorkshire:	247,679 tonnes
Tees Valley Unitary Authorities:	20,861 tonnes
Warwickshire:	3,299 tonnes

Top 10: 493,249 tonnes *(out of total 519,217 tonnes)*

12. ZONE F [51-75 MILES: EAST MIDLANDS]

GEOGRAPHY: *This zone includes urban areas such as Nottingham, Alfreton, and Mansfield as well as rural areas South of Lincoln across to Woodall Spa.*

13.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE F	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	279,583	241,558	320,481	172,639	1,014,261
Percentage	27.6%	23.8%	31.6%	17.0%	100%

Transfer
942,388

INFRASTRUCTURE: *Within this zone are two New Earth Solutions facilities (formerly Mid UK). Designated as Transfer Stations, the underlying data reports that almost all their incoming waste was from 'Lincolnshire'. The designation is misleading; these sites are not merely Transfer Stations for they receive mainly 20 03 01 and send out 19 12 10 and 19 12 12.*

Similarly, the Enva (NG4 2JT) facility, formerly Wastecycle, receives general waste and sends out mostly 19 12 10 (for incineration either in the UK or exported as RDF) and 19 12 12 (much of which goes to landfill).

13.2 KEY OPERATORS IN ZONE: OVERVIEW

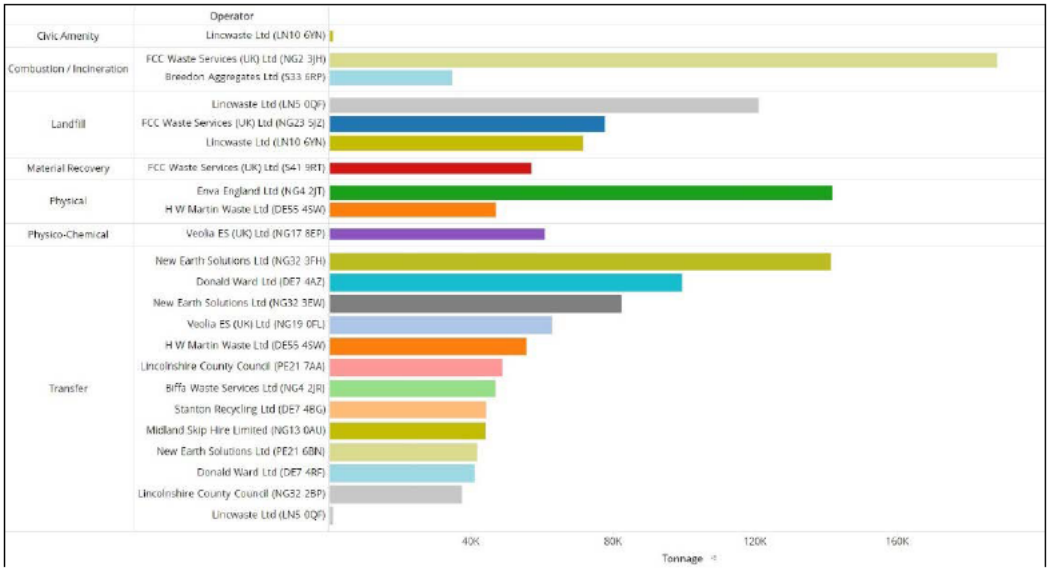


Fig. 13.1 – Zone F Site Overview

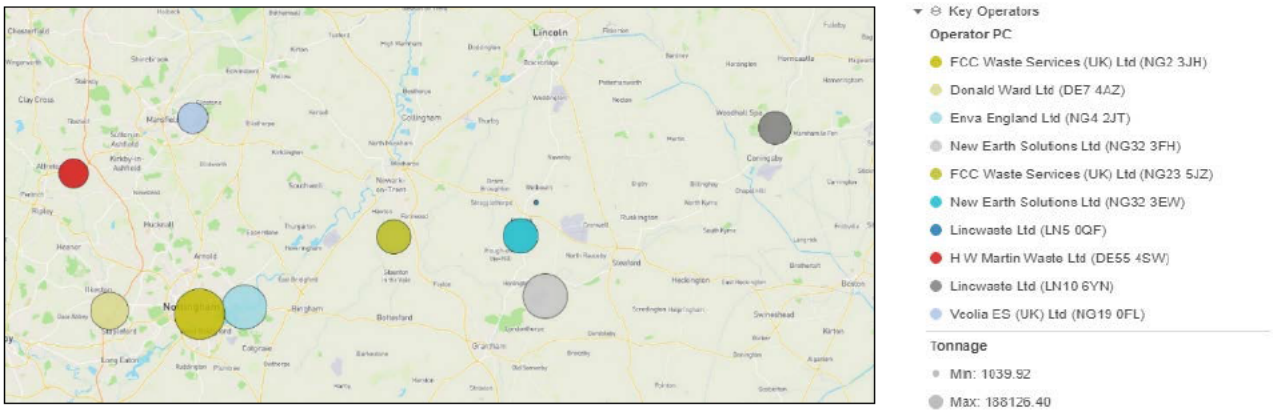
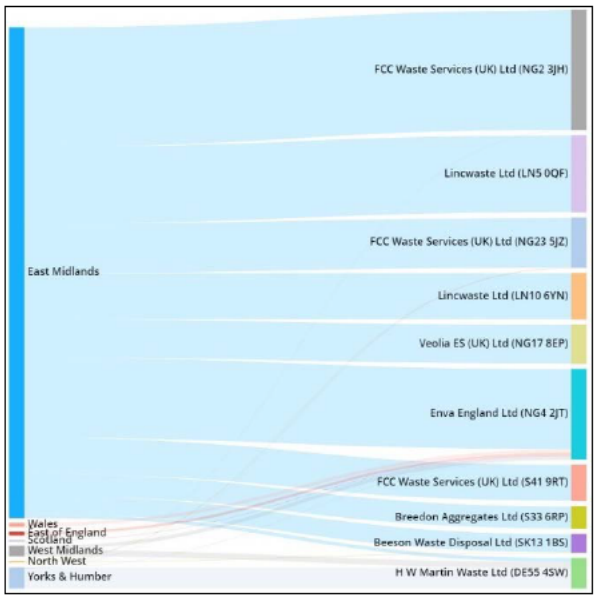


Fig. 13.2 – Zone F Key Operators Map

13.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 13.3 – Zone F Origin Region To Operators (Excludes Transfer Stations)

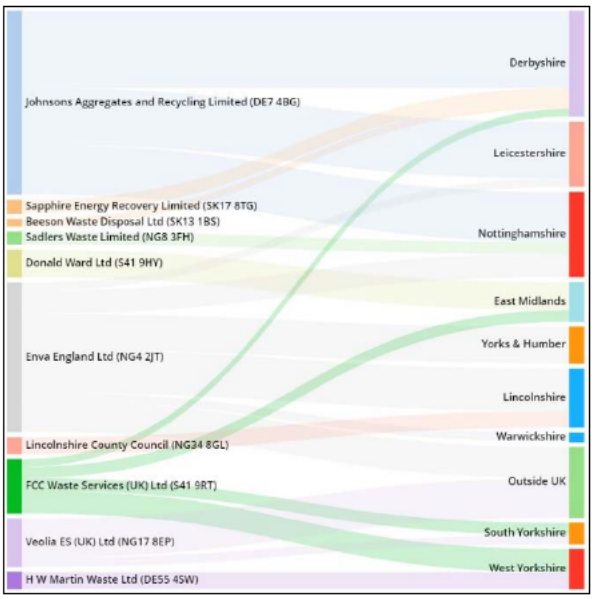
Waste Incoming To Sites In Zone



FCC Waste Services (UK) Ltd (NG2 3JH):	188,122 tonnes
Lincwaste Ltd (LN5 0QF):	120,789 tonnes
FCC Waste Services (UK) Ltd (NG23 5JZ):	77,729 tonnes
Lincwaste Ltd (LN10 6YN):	72,550 tonnes
Veolia ES (UK) Ltd (NG17 8EP):	60,740 tonnes
Enva England Ltd (NG4 2JT):	141,658 tonnes
FCC Waste Services (UK) Ltd (S41 9RT):	56,875 tonnes
Breedon Aggregates Ltd (S33 6RP):	34,587 tonnes
Beeson Waste Disposal Ltd (SK13 1BS):	28,767 tonnes
HW Martin Waste Ltd (DE55 4SW):	46,966 tonnes

Top 10: 828,783 tonnes *(out of total 1,014,261 tonnes)*

Waste Outgoing From Sites In Zone



Derbyshire:	135,436 tonnes
Leicestershire:	66,209 tonnes
Nottinghamshire:	108,907 tonnes
East Midlands:	39,938 tonnes
Yorks & Humber:	37,155 tonnes
Lincolnshire:	65,982 tonnes
Warwickshire:	12,336 tonnes
Outside UK:	71,251 tonnes
South Yorkshire:	21,649 tonnes
West Yorkshire:	39,961 tonnes

Top 10: 598,824 tonnes *(out of total 622,767 tonnes)*

13. ZONE G [76-100 MILES: YORKSHIRE & HUMBER]

GEOGRAPHY: *This zone is a sweeping arc from the very Western edge of Yorkshire in Todmorden, up and Eastwards to Whitby. Since the majority of this is within the Yorkshire Dales and North Yorkshire Moors, waste volumes are low.*

14.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE G	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	0	0	1,539	40,684	42,223
Percentage	0.0%	0.0%	3.6%	96.4%	100%

Transfer
80,082

INFRASTRUCTURE: *Most of the waste received originates from Yorkshire and Humber, with a lesser amount coming from the North West (primarily to the composting site in Todmorden) and a little from the North East to the Veolia site in Northallerton.*

14.2 KEY OPERATORS IN ZONE: OVERVIEW

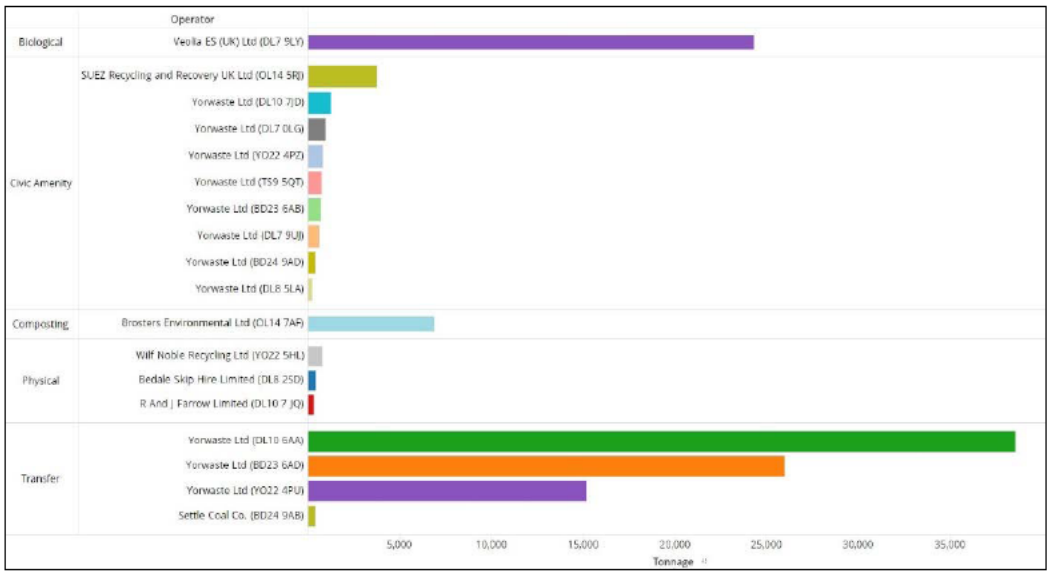


Fig. 14.1 – Zone G Site Overview

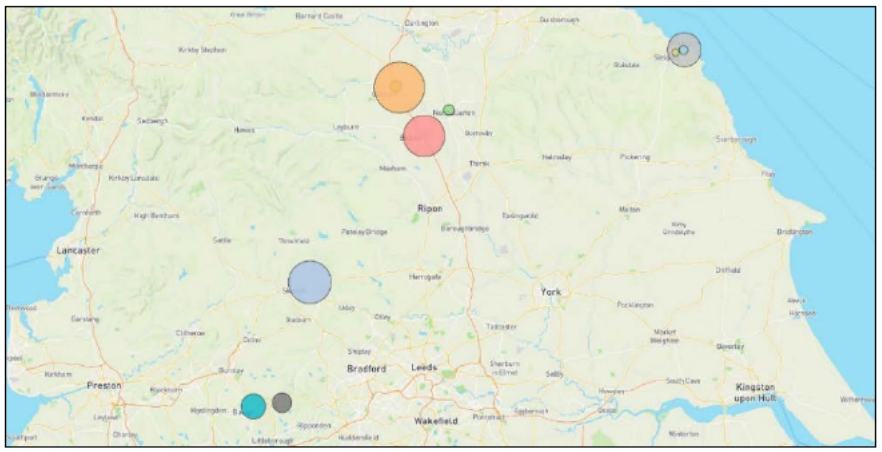
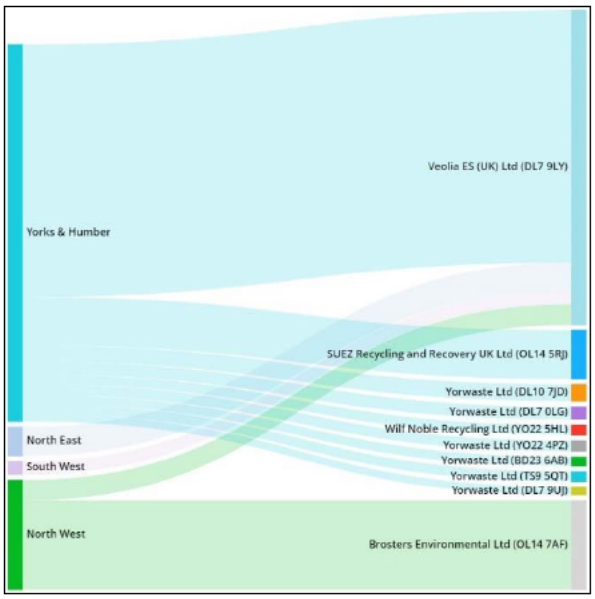


Fig. 14.2 – Zone G Key Operators Map

14.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 14.3 – Zone G Origin Region To Operators (Excludes Transfer Stations)

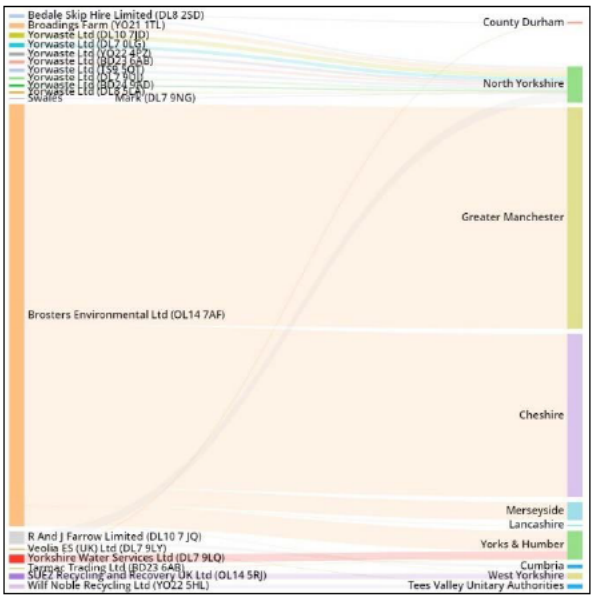
Waste Incoming To Sites In Zone



Veolia ES (UK) Ltd (DL7 9LY):	24,305 tonnnes
SUEZ Recycling & Recovery UK Ltd (OL14 5RJ):	3,740 tonnes
Yorwaste Ltd (DL10 7JD):	1,262 tonnes
Yorwaste Ltd (DL7 0LG):	983 tonnes
Wilf Noble Recycling (YO22 5HL):	765 tonnes
Yorwaste Ltd (YO22 4PZ):	810 tonnes
Yorwaste Ltd (BD23 6AB):	703 tonnes
Yorwaste Ltd (TS9 5QT):	754 tonnes
Yorwaste Ltd (DL7 9UJ):	592 tonnes
Brosters Environmental Ltd (OL14 7AF):	6,870 tonnes

Top 10: 40,784 tonnes *(out of total 42,223 tonnes)*

Waste Outgoing From Sites In Zone



County Durham:	406 tonnes
North Yorkshire:	10,194 tonnes
Greater Manchester:	63,869 tonnes
Cheshire:	47,015 tonnes
Merseyside:	5,063 tonnes
Lancashire:	100 tonnes
Yorks & Humber:	8,132 tonnes
Cumbria:	802 tonnes
West Yorkshire:	1,608 tonnes
Tees Valley Unitary Authorities:	1,018 tonnes

Top 10: 138,207 tonnes *(out of total 138,207 tonnes)*

14. ZONE H [76-100 MILES: NORTH WEST]

GEOGRAPHY: *This zone includes is a heavily-populated and industrial belt, encompassing Stockport and Manchester up to Burnley and Blackburn.*

15.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE H	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	451,857	56,083	728,681	811,469	2,048,090
Percentage	22.1%	2.7%	35.6%	39.6%	100%

Transfer
948,895

INFRASTRUCTURE: *Within Zone H, the SUEZ "Whinney Hill" (BB5 5EN) and Viridor "Pilsworth North" (BL9 8QZ) are the major facilities for general waste disposal. The area is heavily-weighted towards the national corporate waste management companies, with nearly 70% of the received general waste being handled by SUEZ / Viridor / Biffa etc as opposed to smaller independent entities.*

15.2 KEY OPERATORS IN ZONE: OVERVIEW

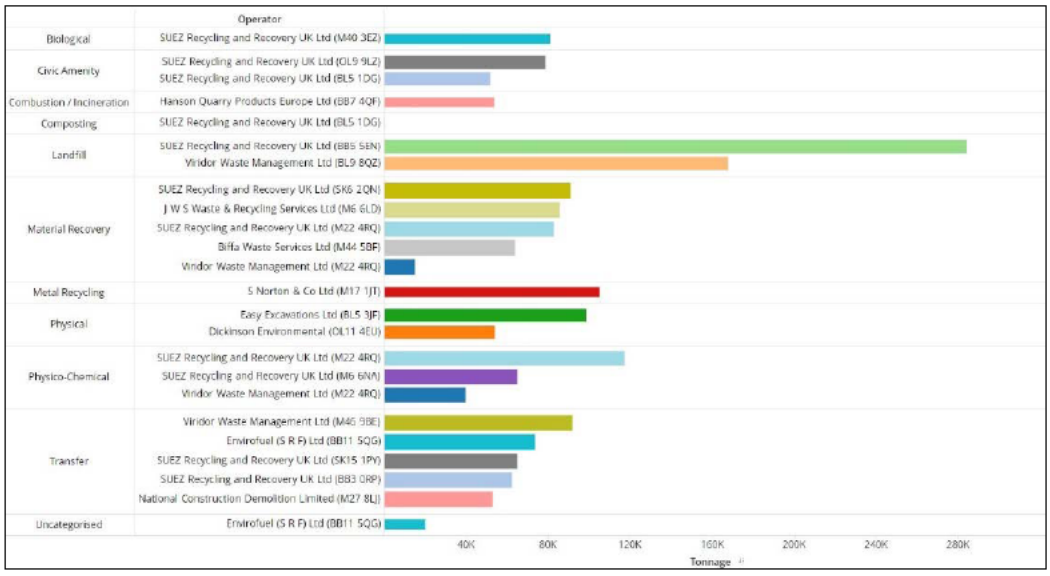


Fig. 15.1 – Zone H Site Overview

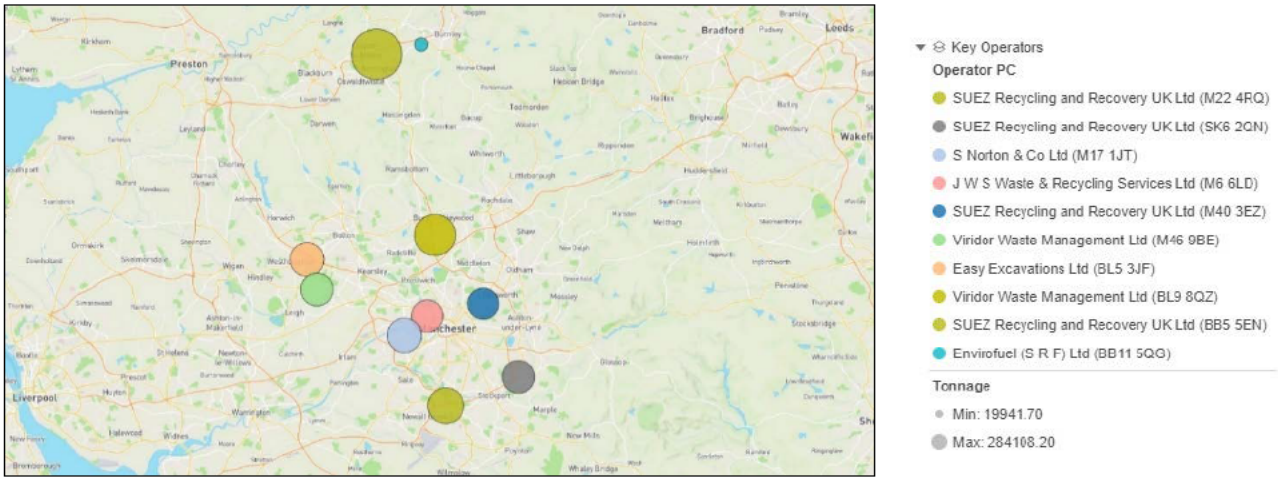
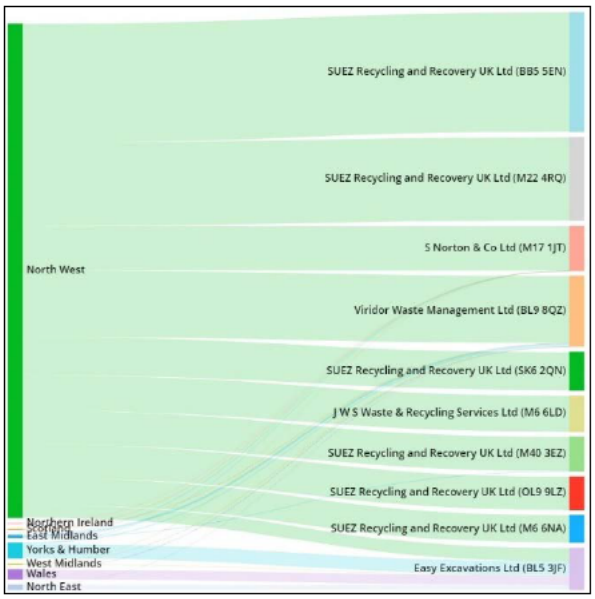


Fig. 15.2 – Zone H Key Operators Map

15.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 15.3 – Zone H Origin Region To Operators (Excludes Transfer Stations)

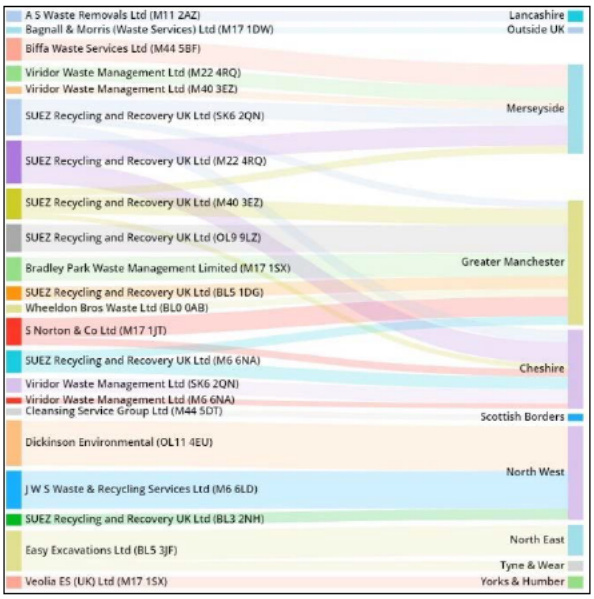
Waste Incoming To Sites In Zone



SUEZ Recycling & Recovery UK Ltd (BB5 5EN):	284,102 tonnnes
SUEZ Recycling & Recovery UK Ltd (M22 4RQ):	199,690 tonnes
S Norton & Co Ltd (M17 1JT):	105,119 tonnes
Viridor Waste Management Ltd (BL9 8QZ):	167,707 tonnes
SUEZ Recycling & Recovery UK Ltd (SK6 2QN):	90,810 tonnes
JWS Waste & Recycling Services Ltd (M6 6LD):	85,554 tonnes
SUEZ Recycling & Recovery UK Ltd (M40 3EZ):	80,728 tonnes
SUEZ Recycling & Recovery UK Ltd (OL9 9LZ):	78,578 tonnes
SUEZ Recycling & Recovery UK Ltd (M6 6NA):	64,902 tonnes
Easy Excavations Ltd (BL5 3JF):	98,478 tonnes

Top 10: 1,255,668 tonnes *(out of total 2,048,090 tonnes)*

Waste Outgoing From Sites In Zone



Lancashire:	100,513 tonnes
Outside UK:	15,949 tonnes
Merseyside:	252,750 tonnes
Greater Manchester:	445,842 tonnes
Cheshire:	214,570 tonnes
Scottish Borders:	15,931 tonnes
North West:	272,774 tonnes
North East:	78,683 tonnes
Tyne & Wear:	26,307 tonnes
Yorks & Humber:	30,547 tonnes

Top 10: 1,453,866 tonnes *(out of total 1,521,917 tonnes)*

15. ZONE I [76-100 MILES: NORTH EAST]

GEOGRAPHY: *The waste management activity in this zone centres on Middlesbrough and Redcar.*

16.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE I	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	200,913	1,101,023	74,526	162,704	1,539,166
Percentage	13.1%	71.5%	4.8%	10.6%	100%

Transfer
180,051

INFRASTRUCTURE: *The two SUEZ EfW facilities are the dominant processing feature in this zone, with the Wilton 11 site (TS90 8WS) and the Haverton Hill plant (TS23 1PY) processing the majority tonnage of general waste (the Wilton 11 site receiving most of its feedstock via rail from Merseyside). The Highfield and Augean landfill sites serve as secondary outlets.*

16.2 KEY OPERATORS IN ZONE: OVERVIEW

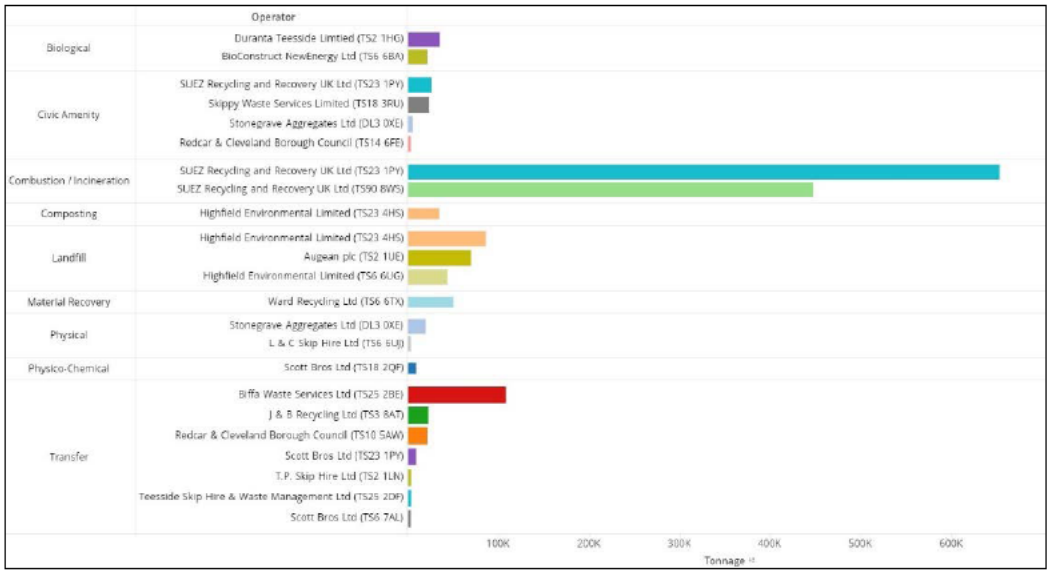


Fig. 16.1 – Zone I Site Overview

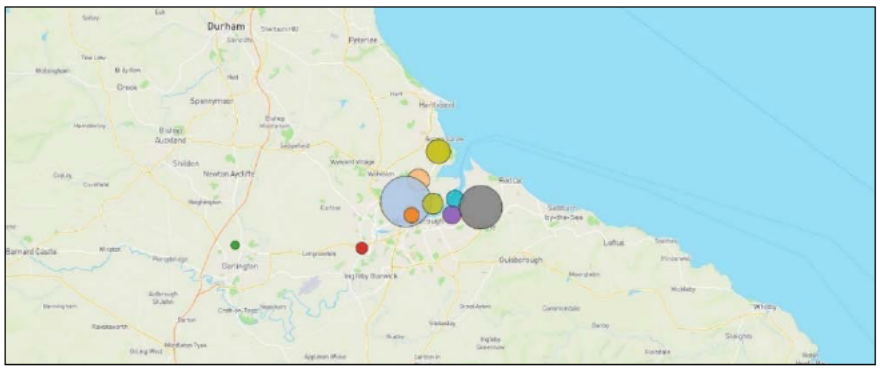


Fig. 16.2 – Zone I Key Operators Map

Key Operators

Operator PC

- Skippy Waste Services Limited (TS18 3RU)
- Stonegrave Aggregates Ltd (DL3 0XE)
- Duranta Teesside Limtied (TS2 1HG)
- Ward Recycling Ltd (TS6 6TX)
- SUEZ Recycling and Recovery UK Ltd (TS90 8...
- Augean plc (TS2 1UE)
- SUEZ Recycling and Recovery UK Ltd (TS23 1PY)
- Highfield Environmental Limited (TS6 6UG)
- Highfield Environmental Limited (TS23 4HS)
- Biffa Waste Services Ltd (TS25 2BE)

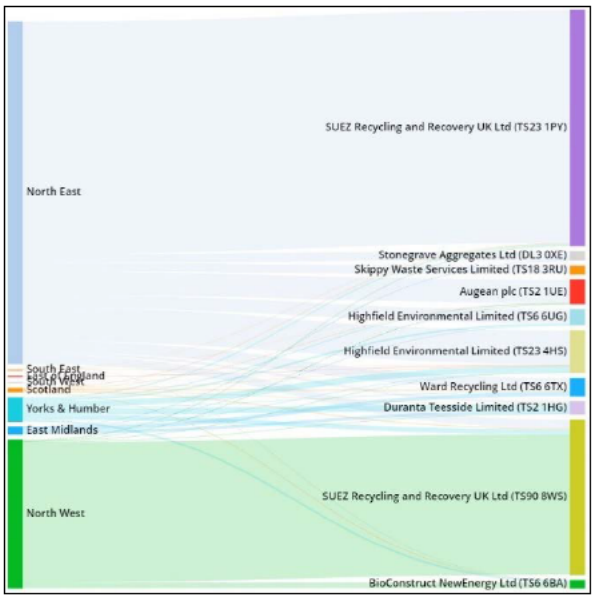
Tonnage

- Min: 5712.08
- Max: 653400.84

16.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 16.3 – Zone I Origin Region To Operators (Excludes Transfer Stations)

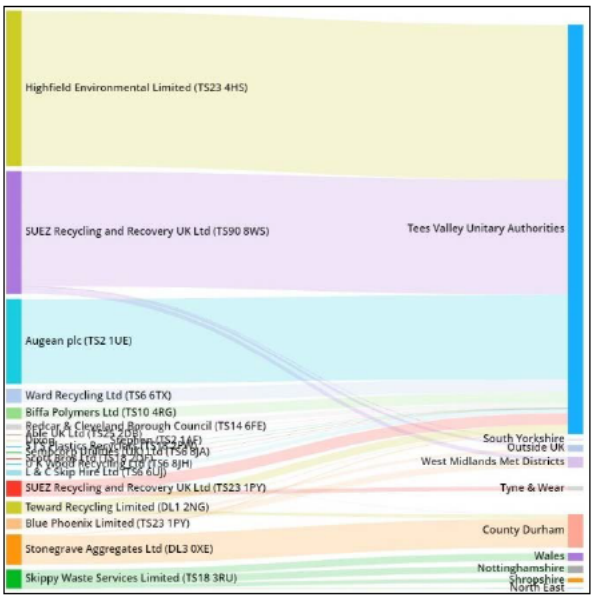
Waste Incoming To Sites In Zone



SUEZ Recycling & Recovery UK Ltd (TS23 1PY):	679,511 tonnnes
Stonegrave Aggregates (DL3 0XE):	25,257 tonnes
Skippy Waste Services Ltd (TS6 6UG):	23,809 tonnes
Augean plc (TS2 1UE):	69,884 tonnes
Highfield Environmental Ltd (TS6 6UG):	43,830 tonnes
Highfield Environmental Ltd (TS23 4HS):	121,476 tonnes
Ward Recycling Ltd (TS6 6TX):	50,474 tonnes
Duranta Teesside Ltd (TS2 1HG):	35,825 tonnes
SUEZ Recycling & Recovery UK Ltd (TS90 8WS):	447,634 tonnes
BioConstruct NewEnergy Ltd (TS6 6BA):	21,946 tonnes

Top 10: 1,519,646 tonnes *(out of total 1,539,166 tonnes)*

Waste Outgoing From Sites In Zone



Tees Valley Unitary Authorities:	313,795 tonnes
South Yorkshire:	80 tonnes
Outside UK:	4,310 tonnes
West Midlands Met Districts:	8,251 tonnes
Tyne & Wear:	3,048 tonnes
County Durham:	25,203 tonnes
Wales:	5,548 tonnes
Nottinghamshire:	5,129 tonnes
Shropshire:	2,934 tonnes
North East:	136 tonnes

Top 10: 368,434 tonnes *(out of total 368,480 tonnes)*

16. ZONE J [76-100 MILES: WEST MIDLANDS]

GEOGRAPHY: *This zone clips the upper-Eastern edge of the West Midlands, with Staffordshire cities such as Stoke-on-Trent and Burton-on-Trent the main areas of activity,*

17.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE J	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	279,665	327	40,969	35,463	356,424
Percentage	78.5%	0.1%	11.5%	9.9%	100%

Transfer
114,054

INFRASTRUCTURE: *The Red Industries landfill ("Walleys Quarry") is far and away the major facility in this outlying zone of the geographical radius. The national corporate companies (Biffa, SUEZ etc) are notable by their absence compared to some other zones.*

17.2 KEY OPERATORS IN ZONE: OVERVIEW

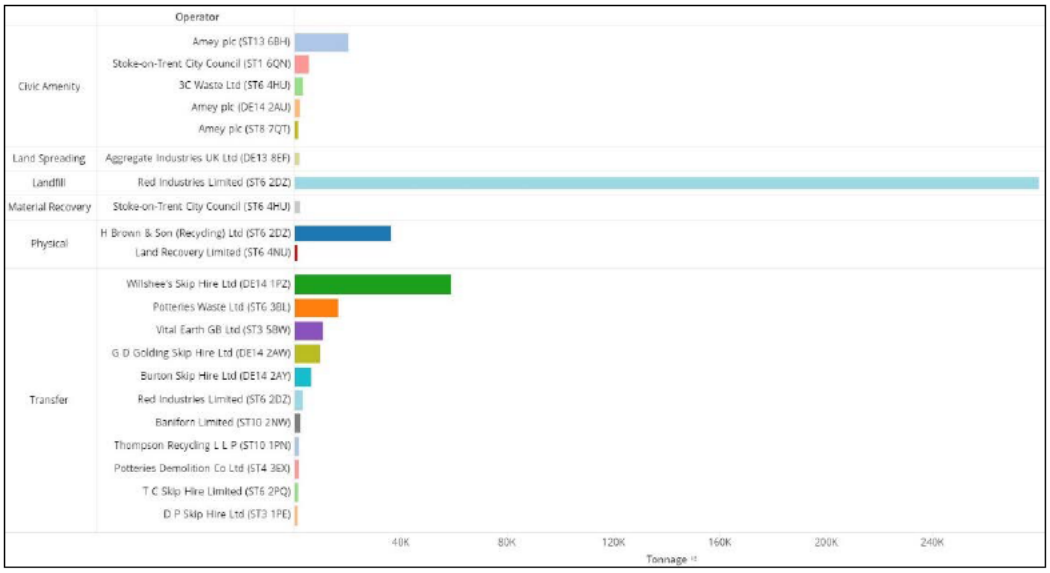


Fig. 17.1 – Zone J Site Overview

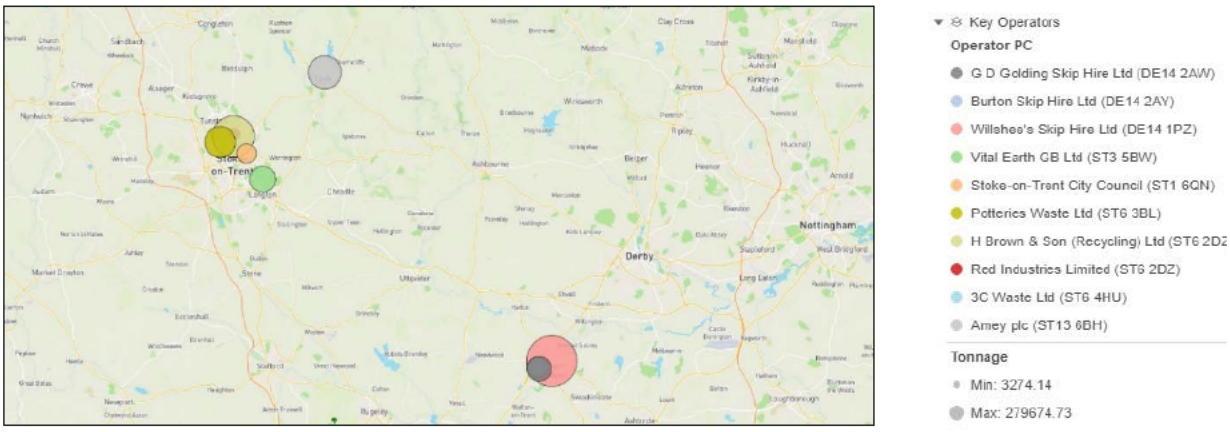
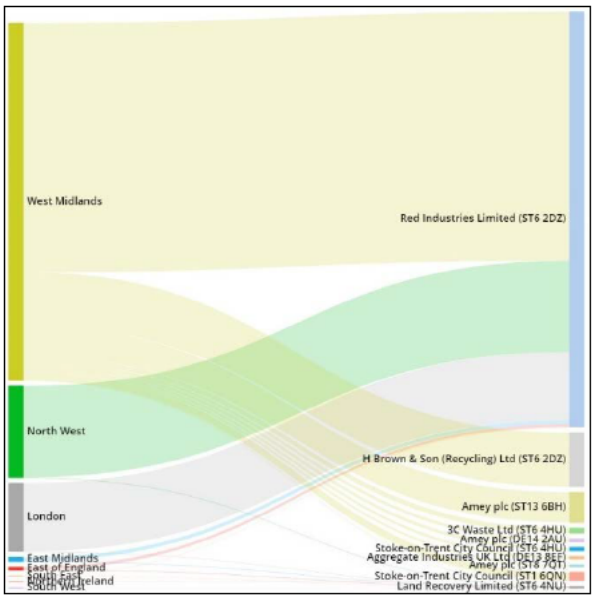


Fig. 17.2 – Zone J Key Operators Map

17.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 17.3 – Zone J Origin Region To Operators (Excludes Transfer Stations)

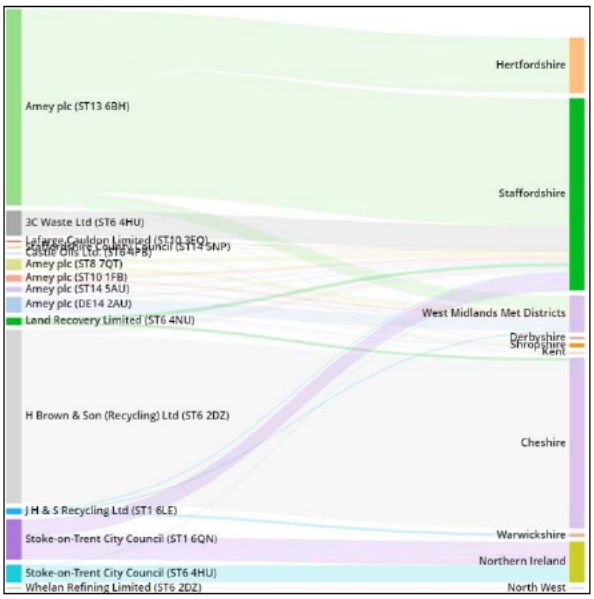
Waste Incoming To Sites In Zone



Red Industries Ltd (ST6 2DZ):	279,665 tonnnes
H Brown & Son (Recycling) Ltd (ST6 2DZ):	36,397 tonnes
Amey plc (ST13 6BH):	20,204 tonnes
3C Waste Ltd (ST6 4HU):	3,337 tonnes
Amey plc (DE14 2AU):	2,063 tonnes
Stoke-on-Trent City Council (ST6 4HU):	2,181 tonnes
Aggregate Industries UK Ltd (DE13 8EF):	1,787 tonnes
Amey plc (ST8 7QT):	1,405 tonnes
Stoke-on-Trent City Council (ST1 6QN):	5,403 tonnes
Land Recovery Limited (ST6 4NU):	1,263 tonnes

Top 10: 353,705 tonnes *(out of total 356,204 tonnes)*

Waste Outgoing From Sites In Zone



Hertfordshire:	7,460 tonnes
Staffordshire:	25,988 tonnes
West Midlands Met Districts:	4,940 tonnes
Derbyshire:	10 tonnes
Shropshire:	407 tonnes
Kent:	29 tonnes
Cheshire:	23.070 tonnes
Warwickshire:	344 tonnes
Northern Ireland:	5,458 tonnes
North West:	12 tonnes

Top 10: 67,718 tonnes *(out of total 67,718 tonnes)*

17. ZONE K [76-100 MILES: EAST MIDLANDS]

GEOGRAPHY: *This zone covers the lower edge of the East Midlands, including Leicestershire and Lincolnshire.*

18.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE K	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	22,570	146,247	341,246	137,242	647,305
Percentage	3.5%	22.6%	52.7%	21.2%	100%

Transfer
353,861

INFRASTRUCTURE: *GAE Smith (Holdings) Ltd is otherwise known as Casepak. Founded by George Smith in 1973, the company has grown from a paper and cardboard recycling specialist into a broad-based recycling company, collecting, sorting and trading a wide range of recovered materials from commercial, industrial and household collections.*

18.2 KEY OPERATORS IN ZONE: OVERVIEW

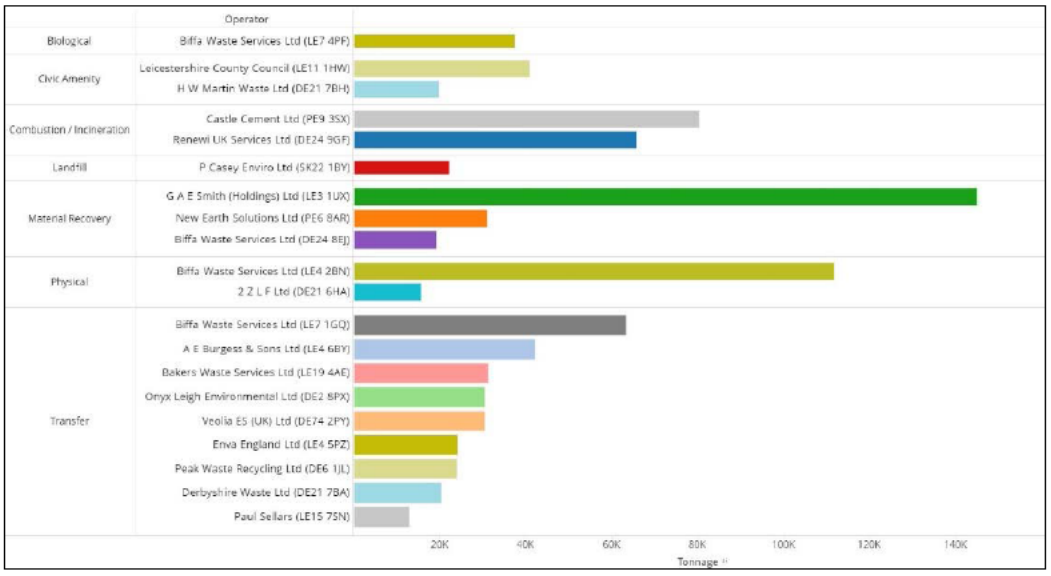


Fig. 18.1 – Zone K Site Overview

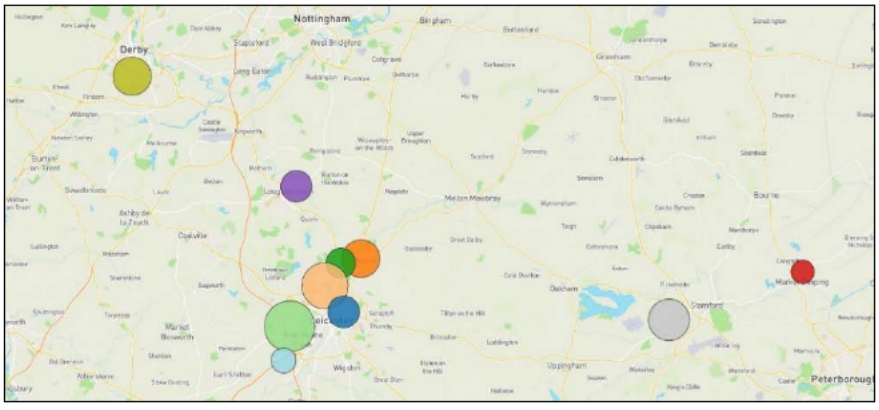
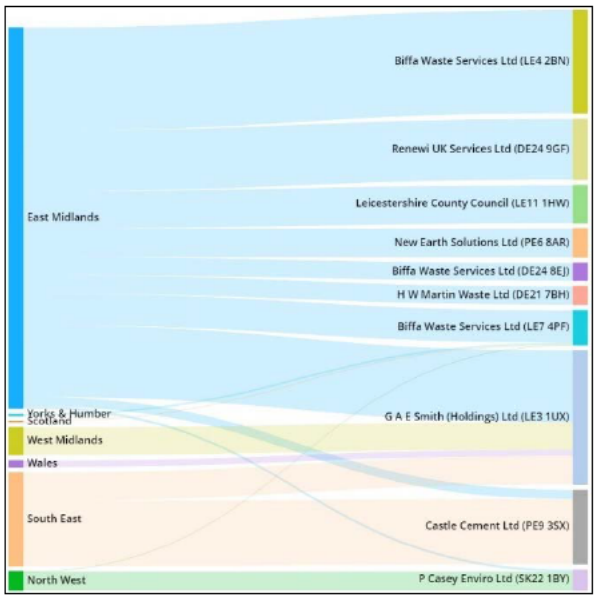


Fig. 18.2 – Zone K Key Operators Map

18.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 18.3 – Zone K Origin Region To Operators (Excludes Transfer Stations)

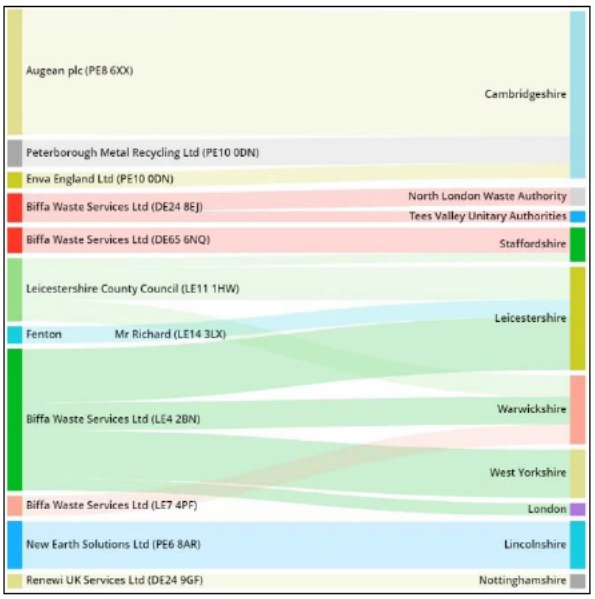
Waste Incoming To Sites In Zone



Biffa Waste Services Ltd (LE4 2BN):	111,712 tonnes
Renewi UK Services Ltd (DE24 9GF):	65,865 tonnes
Leicestershire County Council (LE11 1HW):	40,899 tonnes
New Earth Solutions Ltd (PE6 8AR):	30,977 tonnes
Biffa Waste Services Ltd (DE24 8EJ):	19,256 tonnes
H W Martin Waste Ltd (DE21 7BH):	19,773 tonnes
Biffa Waste Services Ltd (LE7 4PF):	37,377 tonnes
G A E Smith (Holdings) Ltd (LE3 1UX):	145,052 tonnes
Castle Cement Ltd (PE9 3SX):	80,382 tonnes
P Casey Enviro Ltd (SK22 1BY):	22,277 tonnes

Top 10: 573,570 tonnes *(out of total 647,305 tonnes)*

Waste Outgoing From Sites In Zone



Cambridgeshire:	115,633 tonnes
North London Waste Authority:	15,895 tonnes
Tees Valley Unitary Authorities:	7,047 tonnes
Staffordshire:	29,578 tonnes
Leicestershire:	83,240 tonnes
Warwickshire:	48,566 tonnes
West Yorkshire:	31,418 tonnes
London:	8,150 tonnes
Lincolnshire:	38,345 tonnes
Nottinghamshire:	13,553 tonnes

Top 10: 391,425 tonnes *(out of total 431,633 tonnes)*

18. ZONE L [76-100 MILES: EAST OF ENGLAND]

GEOGRAPHY: *This zone just reaches the upper edge of Cambridgeshire and Norfolk, with the Northern edge of Peterborough in the radius.*

19.1 ZONE OVERVIEW (INCOMING GENERAL WASTE TONNAGE)

ZONE L	Landfill	Incineration	Physical / MRF	Other	TOTAL
Tonnage	190,254	0	1,724	2,448	194,426
Percentage	97.9%	0.0%	0.9%	1.3%	100%

Transfer
29,786

INFRASTRUCTURE: *At this outer edge of the geographical radius, the two sites of note are the Thornhaugh Landfill (owned by Augean) and Eye North Eastern Landfill (owned by Biffa).*

19.2 KEY OPERATORS IN ZONE: OVERVIEW

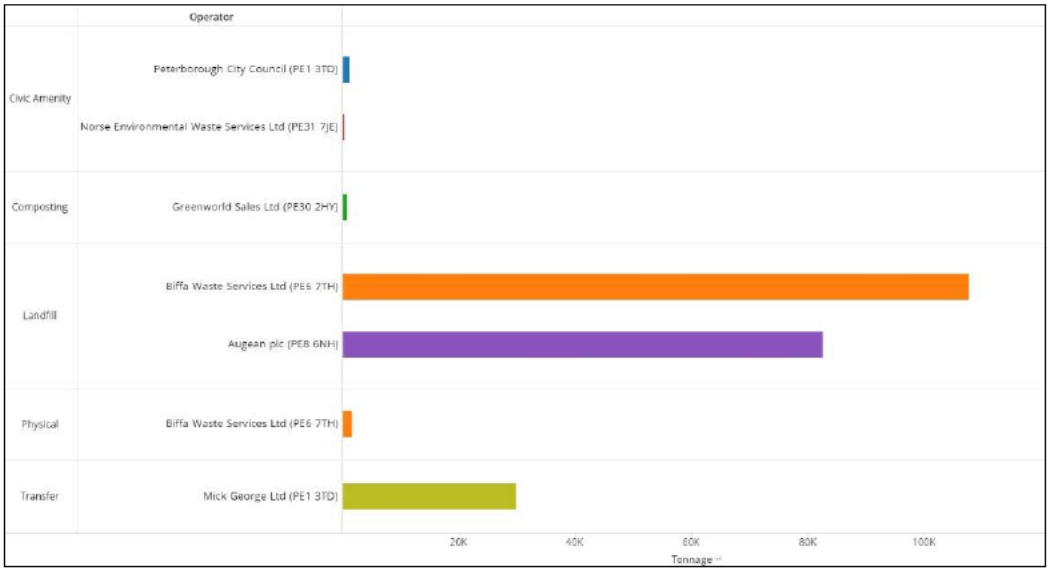


Fig. 19.1 – Zone L Site Overview

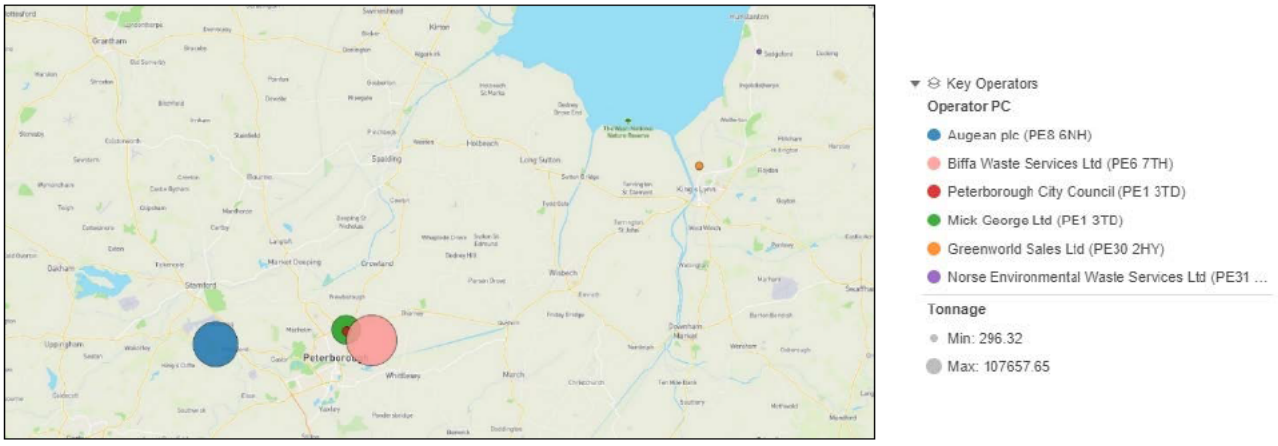
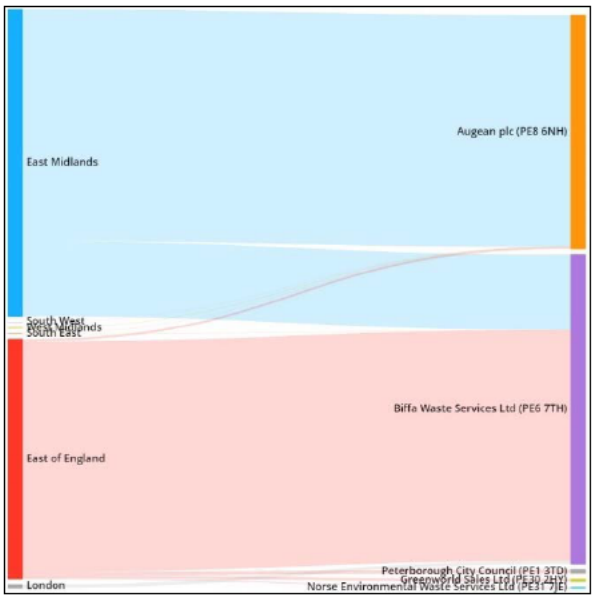


Fig. 19.2 – Zone L Key Operators Map

19.3 ORIGIN REGION TO TOP TEN OPERATORS IN ZONE

Fig. 19.3 – Zone L Origin Region To Operators (Excludes Transfer Stations)

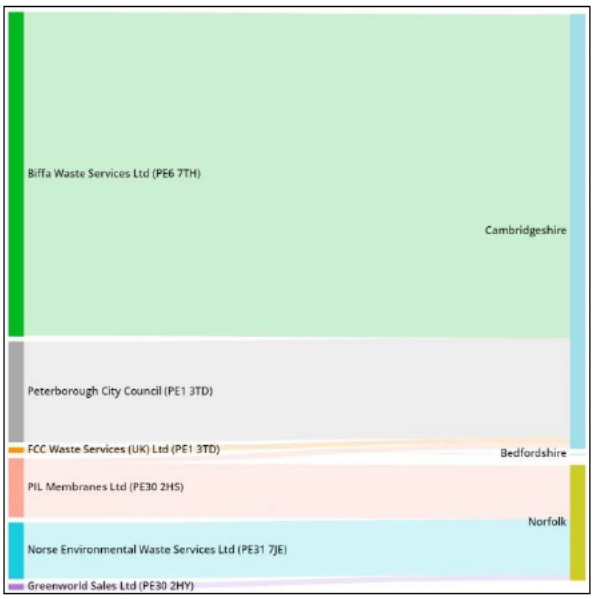
Waste Incoming To Sites In Zone



Augean plc (PE8 6NH):	82,618 tonnes
Biffa Waste Services Ltd (PE6 7TH):	109,360 tonnes
Peterborough City Council (PE1 3TD):	1,302 tonnes
Greenworld Sales Ltd (PE30 2HY):	850 tonnes
Norse Environmental Waste Services Ltd (PE31 7JE):	296 tonnes

Top 5: 194,426 tonnes *(out of total 194,426 tonnes)*

Waste Outgoing From Sites In Zone



Cambridgeshire:	2,306 tonnes
Bedfordshire:	1 tonne
Norfolk:	605 tonnes

Top 3: 2,911 tonnes *(out of total 2,911 tonnes)*

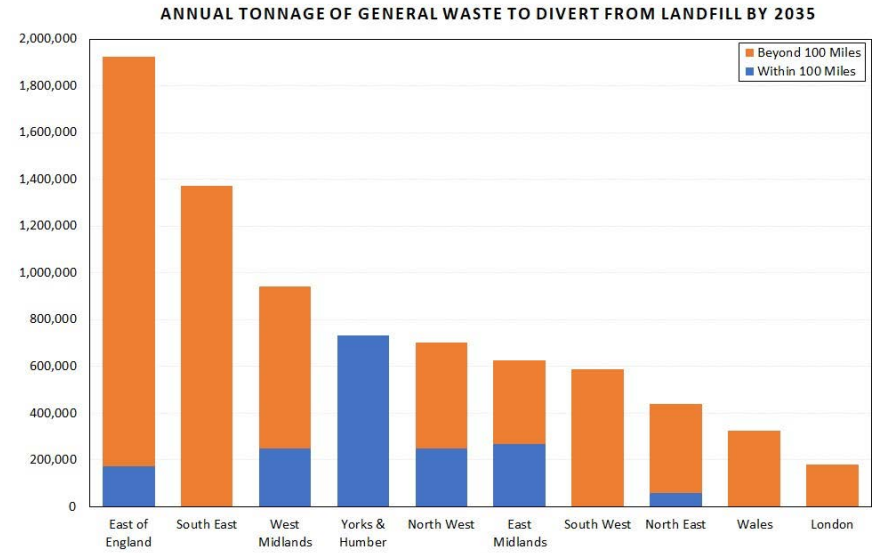
19. CONCLUSIONS

While some landfill sites are currently of regional – and national – significance, such as Biffa Roxby, Lincwaste / FCC Leadenham and Viridor Erin, the unavoidable and inescapable truth is that landfill capacity is set to decline over the next decade as the UK Government strives to meet its obligation to reduce general waste disposed of in landfill to 10% of the MSW produced. That will have a direct impact on the region within 100 miles of Flixborough, where 2.9 million tonnes of general waste was sent to landfill in 2019.

The vast majority of general waste sent to landfill is categorised as EWC 19 12 12 rather than 20 03 01 (see Fig. 3.1). This presents a possible technical loophole whereby Defra could possibly bend the rules to claim that the target has been met; they could, for instance, define MSW as solely 20 03 01, in which case the 10% target has already been very nearly met (10.1% of reported 20 03 01 arisings currently go to landfill). While the present official definition includes a number of general codes including 19 12 12, "Defra are currently reviewing which EWC codes might best reflect municipal waste for reporting going forward and changes will be backdated wherever possible." [20]

The exclusion of 19 12 12 tonnage would be regarded as a deliberate and intentional shirking of an environmental commitment, and such a move is unlikely. Assuming that the definition remains unchanged, therefore, there will be a need to address the non-landfill processing of up to 1.7 million tonnes in the 100-mile region around Flixborough. Fig. 20.1 suggests that, should the Boston Alternative Energy Facility be given the green light, it need not be considered a threat to the Flixborough site by way of feedstock competition given the need for landfill reduction in the East of England.

Fig. 20.1 – General Waste To Divert From Landfill By 2035



What is clear is that the Biffa Roxby site cannot keep on increasing its received MSW, irrespective of the London rail sidings developments. Over the next few years, landfill operators will have pressure exerted upon them; this may be through the approval and development of additional EfW which diverts tonnage away from landfill, thereby hastening their demise through unprofitability, or through the reintroduction of a Landfill Tax Escalator which was previously successful in stimulating the development of Anaerobic Digestion and Energy from Waste networks across the country as well as creating a whole new activity of baling, wrapping and exporting RDF. Ultimately, there is the possibility of a legislative order for enforced closure (such as happened with the UK's remaining coal-fired power stations, banning electricity generation by such means [21]).

However the cultural shift takes place, the reality over the next few years is that the obligatory reduction in landfill tonnages will boost the availability of general waste. There are likely to be jolts along the way; it is unlikely that all the landfill operators will simply tolerate their incoming volumes (and thus Gate Fee revenues) sliding slowly downwards, below the point of profitability, although there can be no viable 'price war' because of the foundational underpinning of the landfill tax. Periodically, a particular operator will simply concede that a given site is no longer viable and another closure will be announced. That will have the temporary effect of propping

[20] *Resources & Waste Strategy 2018 (Defra)*

[21] [redacted]

up other landfills belonging to competitors. Therefore, there will be a reluctance to be the first to go, with a likely degree of corporate brinkmanship. But, as with the slow movement of tectonic plates, there will be quakes as tough, but inevitable, decisions are made.

Biffa appears to be confident about the future of the Roxby landfill, this being the flagship site for their waste-by-rail strategy, but this confidence must nonetheless be weighed up against the political intent to reduce the percentage of active waste going to landfill. Therefore, Biffa may come to accept, however reluctantly, the need to operate in symbiosis with a nearby partner EfW facility, allowing it to continue rail transfers to Roxby Sidings, and the waste then shared between its own landfill and the Flixborough Green Energy site.

Fig. 20.2 – Biffa Rail Hub Strategy [22]

Irrespective of the envisaged tonnage that should materialise as landfills wind down, who has the waste now? Is it tied up with national / multinational players such as Biffa, SUEZ, Veolia, etc, or does the balance tip towards the independent operators? The large, corporate entities are perhaps more inclined to be protective about the waste in their custodianship, preferring to send it to their own sites, as can be seen with Biffa sending waste from London to Roxby or SUEZ transporting waste from Merseyside to Teesside. Deals might more easily be struck with the independent companies such as Transwaste, Associated Waste Management, Ellgia, Mytum & Selby etc, though the tonnages from individual sites may be smaller. Fig. 20.3 suggests it is a roughly-even split in the 0-50 mile range, but beyond that, the big players [23] have the edge. It is highly likely, therefore, that positive relationships will need to be fostered with the larger corporate waste companies if the feedstock is to be secured. Given that Biffa, FCC, Renewi, SUEZ and Veolia all export RDF to third-party EfW sites overseas, they ought to be open to discussing contractual possibilities with a merchant facility such as the Green Energy Centre.

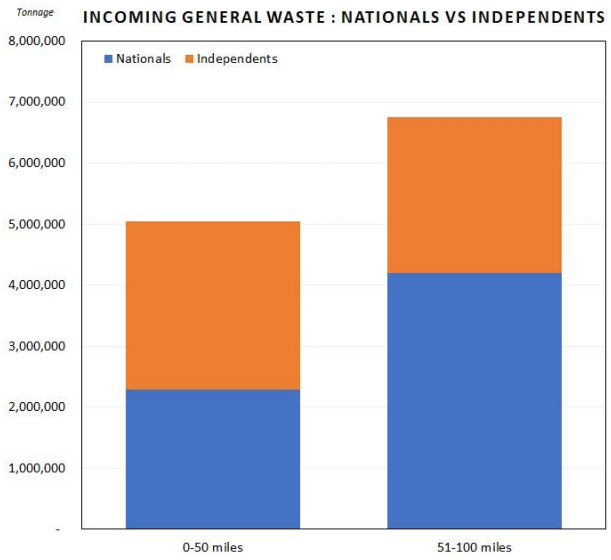


Fig. 20.3 – Nationals vs Independents

Finally, the fact that around 400,000 tonnes of RDF still leaves the UK via Humber ports per year affirms the idea that regional thermal recovery facilities are either unable or unwilling to accept more feedstock. Waste-derived

[22] *Biffa Full Year Results 2018 Presentation*

[23] *Augean, Amey, Biffa, FCC (inc Lincwaste and Welbeck), Renewi, SUEZ, Veolia and Viridor*

fuel brokers such as Geminor, Andusia Recovered Fuels and N&P should be approached, for then the fuel can be sourced from a wider geographic catchment, as evidenced by the supply routes to DFDS Seaways and RMS Grimsby & Immingham, described in Section 10.

This study concludes that the EfW provision within 100 miles of Flixborough is currently able to process the residual waste arisings *only because* landfill and RDF export provision provide a combined additional flexible capacity of over three million tonnes. As landfill capacities decline in line with Governmental intent or decree, the existing EfW facilities will be unable to receive the additional volumes since they are already operating at or close to their headline capacity. This is particularly the case in the area up to 50 miles from Flixborough. Decisions made by EU nations, such as the application of the Waste Import Tax in the Netherlands, have been shown to cause shockwaves to the UK waste processing system, as have unforeseen events such as the Coronavirus pandemic. In both these cases, the outcome has been volumes of RDF (or RDF feedstock material) being sent directly to landfill. Taken together, there is certainly scope for a higher level of flexibility in the regional EfW provision.

The Green Energy Centre development at Flixborough is therefore ideally positioned to provide a necessary service as part of a broad tapestry of sustainable solutions in the North of England.

APPENDIX A

LIST OF ABBREVIATIONS USED IN THIS REPORT

Abbreviation	Description
AWM	Associated Waste Management
EA	Environment Agency
EfW	Energy from Waste
ERF	Energy Recovery Facility
EWC	European Waste Catalogue
FPS	Footprint Services
LA	Local Authority
MBT	Mechanical / Biological Treatment
MRF	Materials Recovery Facility
RDF	Refuse-Derived Fuels
SRF	Secondary Recovered Fuels

APPENDIX B

ZONE TONNAGE BREAKDOWN

Zone	Distance	Region	Notes / Tonnage
A	0-25 miles	Yorkshire & Humber	1.8 million tonnes
B	0-25 miles	East Midlands	22,000 tonnes
C	26-50 miles	Yorkshire & Humber	2.8 million tonnes
D	26-50 miles	East Midlands	414,000 tonnes
E	51-75 miles	Yorkshire & Humber	906,000 tonnes
F	51-75 miles	East Midlands	1.0 million tonnes
G	76-100 miles	Yorkshire & Humber	42,000 tonnes
H	76-100 miles	North West	2.0 million tonnes
I	76-100 miles	North East	1.5 million tonnes
J	76-100 miles	West Midlands	356,000 tonnes
K	76-100 miles	East Midlands	647,000 tonnes
L	76-100 miles	East of England	194,000 tonnes
		TOTAL:	***11.8 million tonnes***

Distance	Notes / Tonnage
0-25 miles	1.9 million tonnes
26-50 miles	3.2 million tonnes
51-75 miles	1.9 million tonnes
76-100 miles	4.8 million tonnes
TOTAL:	***11.8 million tonnes***

Region	Notes / Tonnage
East Midlands	2.1 million tonnes
East of England	194,000 tonnes
North East	1.5 million tonnes
North West	2.0 million tonnes
West Midlands	356,000 tonnes
Yorks & Humber	5.6 million tonnes
TOTAL:	***11.8 million tonnes***

EAST MIDLANDS

Sub-Region	Planning Authority	Category	Landfill	Combustion / Incineration	Physical / MRF	Other	TOTAL	Transfer
Derbyshire	City of Derby	Tonnage	0	65,865	36,297	32,448	134,610	61,682
		Percentage	*0.0%*	*48.9%*	*27.0%*	*24.1%*	*100.0%*	
Derbyshire	Derbyshire	Tonnage	168,916	53,436	162,958	83,613	468,923	398,334
		Percentage	*36.0%*	*11.4%*	*34.8%*	*17.8%*	*100.0%*	
Leicestershire	Leicester City	Tonnage	0	0	256,764	44,958	301,722	87,770
		Percentage	*0.0%*	*0.0%*	*85.1%*	*14.9%*	*100.0%*	
Leicestershire	Leicestershire	Tonnage	0	0	2,022	50,942	52,964	193,833
		Percentage	*0.0%*	*0.0%*	*3.8%*	*96.2%*	*100.0%*	
Leicestershire	Rutland	Tonnage	0	80,382	0	796	81,178	13,077
		Percentage	*0.0%*	*99.0%*	*0.0%*	*1.0%*	*100.0%*	
Lincolnshire	Lincolnshire	Tonnage	209,236	174,031	115,473	26,447	525,187	419,631
		Percentage	*39.8%*	*33.1%*	*22.0%*	*5.0%*	*100.0%*	
Nottinghamshire	Nottingham City	Tonnage	0	188,122	15,559	11,340	215,021	83,603
		Percentage	*0.0%*	*87.5%*	*7.2%*	*5.3%*	*100.0%*	
Nottinghamshire	Nottinghamshire	Tonnage	77,729	0	145,735	94,540	318,004	170,970
		Percentage	*24.4%*	*0.0%*	*45.8%*	*29.7%*	*100.0%*	

NORTH EAST

Sub-Region	Planning Authority	Category	Landfill	Combustion / Incineration	Physical / MRF	Other	TOTAL	Transfer
Tees Valley UA	Darlington	Tonnage	0	0	19,660	5,712	25,372	414
		Percentage	*0.0%*	*0.0%*	*77.5%*	*22.5%*	*100.0%*	
Tees Valley UA	Hartlepool	Tonnage	507	0	0	923	1,430	112,436
		Percentage	*35.5%*	*0.0%*	*0.0%*	*64.5%*	*100.0%*	
Tees Valley UA	Middlesbrough	Tonnage	0	0	160	35,825	35,985	28,944
		Percentage	*0.0%*	*0.0%*	*0.4%*	*99.6%*	*100.0%*	
Tees Valley UA	Redcar and Cleveland	Tonnage	43,830	447,634	54,706	25,642	571,812	28,353
		Percentage	*7.7%*	*78.3%*	*9.6%*	*4.5%*	*100.0%*	
Tees Valley UA	Stockton-on-Tees	Tonnage	156,576	653,389	0	94,602	904,567	9,904
		Percentage	*17.3%*	*72.2%*	*0.0%*	*10.5%*	*100.0%*	

NORTH WEST

Sub-Region	Planning Authority	Category	Landfill	Combustion / Incineration	Physical / MRF	Other	TOTAL	Transfer
Cheshire	Cheshire	Tonnage	0	0	2	11,223	11,225	46,864
		Percentage	*0.0%*	*0.0%*	*0.0%*	*100.0%*	*100.0%*	
Gtr. Manchester	Bolton	Tonnage	48	1,022	98,478	106,734	206,282	446
		Percentage	*0.0%*	*0.5%*	*47.7%*	*51.7%*	*100.0%*	
Gtr. Manchester	Bury	Tonnage	167,707	0	16,463	8,166	192,336	102,190
		Percentage	*87.2%*	*0.0%*	*8.6%*	*4.2%*	*100.0%*	
Gtr. Manchester	Manchester	Tonnage	0	0	99,639	271,495	371,134	130,340
		Percentage	*0.0%*	*0.0%*	*26.8%*	*73.2%*	*100.0%*	
Gtr. Manchester	Oldham	Tonnage	0	1,556	0	78,578	80,134	42,112
		Percentage	*0.0%*	*1.9%*	*0.0%*	*98.1%*	*100.0%*	
Gtr. Manchester	Rochdale	Tonnage	0	0	53,872	12,408	66,280	95,945
		Percentage	*0.0%*	*0.0%*	*81.3%*	*18.7%*	*100.0%*	
Gtr. Manchester	Salford	Tonnage	0	0	222,760	104,898	327,658	79,101
		Percentage	*0.0%*	*0.0%*	*68.0%*	*32.0%*	*100.0%*	
Gtr. Manchester	Stockport	Tonnage	0	0	91,770	38,727	130,497	12,616
		Percentage	*0.0%*	*0.0%*	*70.3%*	*29.7%*	*100.0%*	
Gtr. Manchester	Tameside	Tonnage	0	0	27,500	3,934	31,434	106,609
		Percentage	*0.0%*	*0.0%*	*87.5%*	*12.5%*	*100.0%*	
Gtr. Manchester	Trafford	Tonnage	0	0	73,889	139,116	213,005	13,290
		Percentage	*0.0%*	*0.0%*	*34.7%*	*65.3%*	*100.0%*	
Gtr. Manchester	Wigan	Tonnage	0	0	0	1,053	1,053	91,554
		Percentage	*0.0%*	*0.0%*	*0.0%*	*100.0%*	*100.0%*	
Lancashire	Blackburn with Darwen	Tonnage	0	0	0	6,360	6,360	83,315
		Percentage	*0.0%*	*0.0%*	*0.0%*	*100.0%*	*100.0%*	
Lancashire	Lancashire	Tonnage	284,102	53,505	44,308	28,777	410,692	144,513
		Percentage	*69.2%*	*13.0%*	*10.8%*	*7.0%*	*100.0%*	

YORKSHIRE & HUMBER

Sub-Region	Planning Authority	Category	Landfill	Combustion / Incineration	Physical / MRF	Other	TOTAL	Transfer
Humberside	East Riding of Yorkshire	Tonnage	8,418	0	134,766	89,853	233,037	66,088
		Percentage	*3.6%*	*0.0%*	*57.8%*	*38.6%*	*100.0%*	
Humberside	Kingston Upon Hull City	Tonnage	0	9,155	501,235	99,334	609,724	19,979
		Percentage	*0.0%*	*1.5%*	*82.2%*	*16.3%*	*100.0%*	
Humberside	North East Lincolnshire	Tonnage	26,110	51,164	798	6,300	84,372	398,409
		Percentage	*30.9%*	*60.6%*	*0.9%*	*7.5%*	*100.0%*	
Humberside	North Lincolnshire	Tonnage	843,917	20,345	2,303	40,397	906,962	523,553
		Percentage	*93.0%*	*2.2%*	*0.3%*	*4.5%*	*100.0%*	
North Yorks	North Yorkshire	Tonnage	408	255,933	109,921	143,633	509,895	180,094
		Percentage	*0.1%*	*50.2%*	*21.6%*	*28.2%*	*100.0%*	
North Yorks	York, City of	Tonnage	4,489	0	4,156	1,090	9,735	99,468
		Percentage	*46.1%*	*0.0%*	*42.7%*	*11.2%*	*100.0%*	
South Yorks	Barnsley	Tonnage	0	0	0	3,291	3,291	36,787
		Percentage	*0.0%*	*0.0%*	*0.0%*	*100.0%*	*100.0%*	
South Yorks	Doncaster	Tonnage	100,450	0	190,228	5,065	295,743	118,982
		Percentage	*34.0%*	*0.0%*	*64.3%*	*1.7%*	*100.0%*	
South Yorks	Rotherham	Tonnage	824	0	26,547	238,839	266,210	202,975
		Percentage	*0.3%*	*0.0%*	*10.0%*	*89.7%*	*100.0%*	
South Yorks	Sheffield	Tonnage	0	230,553	79,796	15,910	326,259	129,813
		Percentage	*0.0%*	*70.7%*	*24.5%*	*4.9%*	*100.0%*	
West Yorks	Bradford City	Tonnage	0	0	47,857	17,905	65,762	276,806
		Percentage	*0.0%*	*0.0%*	*72.8%*	*27.2%*	*100.0%*	
West Yorks	Calderdale	Tonnage	0	0	19,233	30,237	49,470	60,947
		Percentage	*0.0%*	*0.0%*	*38.9%*	*61.1%*	*100.0%*	
West Yorks	Kirklees	Tonnage	0	136,574	15,063	106,582	258,219	90,509
		Percentage	*0.0%*	*52.9%*	*5.8%*	*41.3%*	*100.0%*	
West Yorks	Leeds	Tonnage	151,294	141,549	498,710	55,073	846,626	168,819
		Percentage	*17.9%*	*16.7%*	*58.9%*	*6.5%*	*100.0%*	
West Yorks	Wakefield	Tonnage	165,006	795,616	127,345	6,445	1,094,412	76,933
		Percentage	*15.1%*	*72.7%*	*11.6%*	*0.6%*	*100.0%*	

APPENDIX C

NON-HAZARDOUS, GENERAL WASTE LANDFILL SITES WITHIN 100 MILES OF FLIXBOROUGH

(Capacity = 2019 declared volume (m^3))

			Received General Waste			
Distance	**Operator**	**Site Name**	**2017**	**2018**	**2019**	**Capacity**
0-25 miles	BDR Waste Disposal Ltd (DN7 4JT)	Bootham Lane Landfill EPR/BV4428IU	1,936	3,766	3,282	1,007,135
	Biffa Waste Services Ltd (DN15 0BD)	Roxby Landfill EPR/BW2951IM	445,620	611,448	843,921	3,619,867
	British Steel Ltd (DN15 6UW)	Crosby North Landfill EPR/CP3036AJ	294			1,641,736
	City Plant Limited (HU15 2QG)	Gilberdyke Landfill EPR/CP3232FQ	11,279			-
	Dispit Limited (HU10 6DP)	Great Gutter Lane Landfill			2,625	-
	Integrated Waste Management Ltd (YO43 4ED)	GALLYMOOR LANDFILL	2,366	4,015		1,243,333
	Lincwaste Ltd (DN21 1AF)	Gainsborough Landfill EPR/YP3030BT			16,674	1,832,419
26-50 miles	BDR PROPERTY LIMITED (S66 9AB)	Thurcroft Landfill EPR/BS6939IN			737	184,614
	Biffa Waste Services Ltd (LS15 9AD)	Skelton Grange Composting Facility EPR/ZP3535AU	273,772	82,070	1,345	-
	Caird Peckfield Limited (LS25 4DW)	Peckfield Landfill EPR/BU9726IH	208,959	197,251	149,954	247,000
	Catplant Quarry Ltd (DN6 7EX)	HAZEL LANE QUARRY AND LANDFILL	116,455	106,829	97,207	231,128
	C F Harris Ltd (LS25 6BJ)	Copley Lane Quarry		43	409	-
	FCC Waste Services (UK) Ltd (DN22 8RB)	Daneshill Landfill Site	467			-
	Integrated Waste Management Ltd (DN40 1QR)	Immingham Landill Site	16,869	12,876	26,118	98,949
	Outokumpu Stainless Limited (S9 1TR)	Tinsley Park Works Landfill Site		13		232,786
	Sandsfield Gravel Company Ltd (YO25 8SA)	Milegate Extension Landfill Site	5,230	5,650	5,793	708,788
	Speciality Steel UK Limited (S60 1DW)	Oxbow Lake Landfill			88	58,858
	Viridor Waste Management Ltd (S3 8AG)	Parkwood Road Landfill Site EPR/BW0983IT/V007	2,749			-
	Viridor Waste Management Ltd (S44 5HS)	Erin Landfill EPR/BW0991IX	174,355	140,071	137,106	5,393,913
	Welbeck Waste Management Ltd (WF6 2JA)	Welbeck Landfill Site	146,386	237,345	165,043	1,005,550
	Yorwaste Ltd (YO23 3RR)	Harewood Whin Compost Facility	165,486	103,247	4,490	600,000
51-75 miles	FCC Waste Services (UK) Ltd (HG5 0SD)	Allerton Park Landfill Site	48,344			2,161,472
	FCC Waste Services (UK) Ltd (NG23 5JZ)	Staple Quarry Landfill EPR/BW3125IA	121,287	73,692	77,752	58,847
	Knapton Quarry Limited (YO17 8JA)	Knapton Quarry Landfill	5,694	650		-
	Lincwaste Ltd (LN10 6YN)	Kirkby On Bain Civic Amenity Site	29,118	45,855	71,493	76,437
	Lincwaste Ltd (LN5 0QF)	LEADENHAM LANDFILL		6,062	120,804	112,267
	Slinter Mining Company Ltd (DE4 3QU)	Slinter Top Quarry	2,718	9,914	9,584	-
76-100 miles	3C Waste Ltd (SK11 9QP)	DANES MOSS LANDFILL	1,125			547,848
	ALAB Environmental Services Ltd (TS25 2BJ)	SEATON MEADOWS		439	509	546,579
	Augean plc (PE8 6NH)	Thornhaugh Landfill Site - EPR/RP3133PP	5,416	45,580	82,624	1,921,300
	Augean plc (TS2 1UE)	Port Clarence landfill Site (Haz)	48,373	48,943	69,895	352,152
	Biffa Waste Services Ltd (PE6 7TH)	Eye North Eastern Landfill	71,839	94,718	107,658	580,780
	Booth Ventures Limited (BL2 4LT)	Harwood Quarry EPR/BV8741IL	70	19	48	1,336,188

Received General Waste

Distance	Operator	Site Name	2017	2018	2019	Capacity
	FCC Waste Services (UK) Ltd (PE1 3TD)	Dogsthorpe Landfill Site	117,375	19,583		-
	Highfield Environmental Limited (TS23 4HS)	Cowpen Bewley Landfill EPR/FP3993MG	11,132	45,370	86,699	1,195,683
	Highfield Environmental Limited (TS6 6UG)	ICI No 2 Teesport EPR/RP3631DA	52,515	33,657	43,859	1,287,907
	Lincwaste Ltd (NG33 5QT)	COLSTERWORTH LANDFILL SITE	22,720	22,347	294	3,531,782
	P Casey Enviro Ltd (SK22 1BY)	Arden Quarry Landfill EPR/BW1416IQ	75,594	66,968	22,283	1,908,533
	Red Industries Limited (ST6 2DZ)	Sneyd Hill Transfer and Treatment Centre EPR/LP3335MQ	153,724	210,507	279,675	1,868,167
	SUEZ Recycling and Recovery UK Ltd (BB5 5EN)	Whinney Hill (Phase 2) Landfill EPR/BL9500IJ	351,634	324,701	284,108	1,244,595
	Veolia ES (UK) Ltd (DE11 8HD)	New Albion Landfill EPR/BJ6003IF	158,161	102,692		-
	Viridor Waste Management Ltd (BL9 8QZ)	PILSWORTH NORTH LANDFILL SITE	173,920	216,265	167,775	4,442,145
	Whitehead Restoration Ltd (M29 7JZ)	Whitehead Landfill EPR/ZP3433AQ	102,378	105,988		-
		Sum:	***2,971,637***	***2,768,068***	***2,879,851***	***41,278,758***

APPENDIX D

ENERGY FROM WASTE SITES WITHIN 100 MILES OF FLIXBOROUGH

(OPN = Operational, DEV = Development, PLN = Planning approved)

Distance	Plant Name	Operator	Postcode	Status	Capacity	MW	Region
0-25 miles	Energy Works Incineration Plant	Energy Works / The Spencer Group	HU8 8AD	DEV	240,000	28MWe, 10MWt	Yorks & Humber
	Melton Waste Park Incineration Plant	Solar 21 Renewable Energy	HU14 3HH	PLN	250,000	22MWe	Yorks & Humber
26-50 miles	Skelton Grange Incineration Plant	Multifuel Energy Ltd	LS10 1RR	DEV	410,000	39MWe	Yorks & Humber
	Lincoln Incineration Plant	FCC Environmental	LN6 3QZ	OPN	190,000	13.1MWe	East Midlands
	Grimsby Incineration Plant	Newlincs Development Ltd	DN41 8BZ	OPN	56,000	3.4MWe, 2.5MWt	Yorks & Humber
	Ferrybridge FM1 Incineration Plant	Scottish & Southern Energy	WF11 8SD	OPN	570,000	68MW	Yorks & Humber
	Ferrybridge FM2 Incineration Plant	Scottish & Southern Energy	WF11 8SD	OPN	675,000	90MW	Yorks & Humber
	Sheffield Incineration Plant	Veolia	S4 7YX	OPN	225,000	19MWe, 60MWt	Yorks & Humber
	Leeds Cross Green Incineration Plant	Veolia	LS9 0SG	OPN	214,000	11MWe	Yorks & Humber
	South Humber Bank Energy Centre	EPUKI	DN41 8DB	PLN	616,500	95MWe	Yorks & Humber
	Great Coates Energy Incineration Plant	Great Coates Energy Ltd	DN31 2TT	PLN	226,000	18MWe	Yorks & Humber
	North Beck Energy Centre	North Beck Energy Ltd	DN40 1QN	PLN	500,000	49.5MWe	Yorks & Humber
	NU-Energy Incineration Plant	NU-Energy Ltd	DN41 8DT	PLN	350,000	20MWe	Yorks & Humber
	Southmoor Energy Centre Incineration Plant	Peel Environmental	WF11 8DN	PLN	350,000	32.4MWe	Yorks & Humber
	Houghton Main Energy Centre	Peel Environmental	S71 5EX	PLN	150,000	20MWe	Yorks & Humber
51-75 miles	Allerton Incineration Plant	AmeyCespa	HG5 0SD	OPN	320,000	24MWe	Yorks & Humber
	Eastcroft Incineration Plant	FCC Environmental	NG2 3JH	OPN	260,000	9MWe	East Midlands
	Kirklees Incineration Plant	Suez	HD1 6NT	OPN	150,000	9.5MWe	Yorks & Humber
	Boston Alternative Energy Waste Gasification Facility	Alternative Use Group plc & Alchemy Farms	PE21 7TN	PLN	1,000,000	80MWe	East Midlands
	Aire Valley Incineration Plant	Endless Energy / Halton Group	BD21 4LW	PLN	100,000	10MWe	Yorks & Humber
	Bradford Energy Recovery Facility	Energos	BD4 7HH	PLN	150,000	12.85MWe	Yorks & Humber
	Knapton Quarry Incineration Plant	Knapton Green Energy	YO17 8JA	PLN	65,000	8MWe	Yorks & Humber
76-100 miles	Sinfin Waste Gasification Plant	Resource Recovery Solutions (Derbyshire) Ltd	DE24 9GF	DEV	190,000	12MWe	East Midlands
	Bolton Incineration Plant	Suez	BL3 2NP	OPN	85,000	10.8MWe	North West
	Teeside (Haverton Hill) Incineration Plant	Suez	TS23 1PY	OPN	756,000	21MW	North East
	Wilton 11 Incineration Plant	Suez	TS90 8WS	OPN	500,000	49MWe	North East
	Newhurst Quarry Incineration Plant	Biffa	LE12 9BU	PLN	350,000	42MWe	East Midlands
	Drakelow Renewable Energy Centre	Future Earth Energy	DE15 9UA	PLN	169,000	15MWe	West Midlands
	Graythorp Energy Centre Incineration Plant	Graythorp Energy Ltd	TS25 2DF	PLN	550,000	49.5MWe	North East
	Bowesfield Industrial Estate Incineration Plant	Green Energy North East	TS18 3BL	PLN	20,000	2.6MWe	North East
	Redcar Incineration Plant	Hartlepool Borough Council	TS6 6LU	PLN	450,000	40MWe	North East

Distance	Plant Name	Operator	Postcode	Status	Capacity	MW	Region
	Billingham Waste Gasification Plant	Haverton WTV Ltd / EQTEC / Scott Bros	TS23 1PX	PLN	200,000	25MWe, 34MWt	North East
	Billingham Chemical Works Incineration Plant	O2N Energy (Billingham) LLP	TS23 1LE	PLN	150,000	12MWe	North East
	Redcar Energy Centre Incineration Plant	Redcar Holdings Ltd	TS10 5QW	PLN	500,000	49.9MWe	North East
	Darwen Incineration Plant	Suez	BB3 0RP	PLN	500,000		North West