



NORTH LINCOLNSHIRE GREEN ENERGY PARK

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North Lincolnshire Green Energy Park

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RDF SUPPLY ASSESSMENT FOR
NORTH LINCOLNSHIRE GREEN
ENERGY PARK

A report to North Lincolnshire
Green Energy Park Limited

09 November 2021

Report

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RDF Supply Assessment for North Lincolnshire Green Energy Park

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Executive summary

North Lincolnshire Green Energy Park Limited (The Project) is developing the Project at Flixborough Industrial Estate, North Lincolnshire. A key component of the development is an energy recovery facility generating electricity and heat from refuse derived fuel (RDF) and non-hazardous household and commercial waste. This report is on behalf of the Project, to support its' application for a Development Consent Order under Section 37 of the Planning Act 2008.

The Project will process up to 760,000 tonnes of RDF and non-hazardous household and commercial waste per year. It is estimated that up to 5,000 tonnes of scrap metal will be recovered for recycling per annum and up to 25,000 tonnes of recyclable plastic will be processed to produce 20,000 tonnes of recycled plastic in an onsite plastic recycling facility. Waste left after recycling will be combusted at high temperatures to produce steam, which will drive a turbine to create electricity. Electricity output will be up to 95MWe. Fly ash and bottom ash produced by the energy recovery process will be used on site to make concrete blocks, recycling around 130,000 tonnes of ash. The Project includes CCU and will be CCUS-enabled, with plans to accommodate carbon capture technology and plans to connect to Zero Carbon Humber to enable the long-term storage of carbon dioxide.

This analysis indicated that in a scenario in which England meets its existing recycling targets, an additional 4.7 million tonnes of recovery capacity is required to ensure that residual waste that cannot be recycled can be processed for energy recovery in 2035.

While a considerable amount of energy from waste capacity is under development, there is a high level of uncertainty about how much of this capacity will be realised. If new build energy from waste is required to be CCUS-ready in order to align with the UK's Net Zero commitments, then the Project is among the small

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minority of pipeline projects which are well placed to connect to a CCUS cluster.

The Project meets the objectives of the North Lincolnshire Council's Waste Strategy, as the facility will take RDF feedstock made from residual waste previously subject to recycling at separate collection or MRF facility, and so the production of feedstock to be recovered in the facility will not negatively influence recycling targets. Energy from waste using RDF feedstock is a recovery option consistent with the principles of the waste hierarchy as it diverts waste from landfill. Furthermore, the Project site at Flixborough Industrial Estate is aligned with the local council's strategy where the site is identified as suitable for a waste management facility.

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Report history

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Abbreviations

Abbreviation	Description
BEIS	Department for Business, Energy and Industrial Strategy
C&I	Commercial and Industrial waste
CCC	Climate Change Committee
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Usage
CCUS	Carbon Capture, Usage and Storage
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EC	European Commission
EfW	Energy from Waste
ETS	Emissions Trading System
EWC	European Waste Catalogue
GHG	Greenhouse gas
GVA	Gross value add
kt	Kilotonne
MBT	Mechanical-biological treatment
Mt	Million tonne
MWe	Megawatt electricity
NLGEF	North Lincolnshire Green Energy Park (The Project)
NLGEPL	The Applicant
OECD	Organization for Economic Co-operation and Development
RDF	Refuse Derived Fuel
SRF	Solid Recovered Fuel

Report

1 Introduction

1.1.1.1 This Fuel Availability and Waste Hierarchy Assessment is for the North Lincolnshire Green Energy Park (the Project). This report is on behalf of North Lincolnshire Green Energy Park Limited (the Applicant), to support its' application for a Development Consent Order (DCO) under Section 37 of the Planning Act 2008 (the Act).

1.1.1.2 The Project requires a DCO as it falls within the definition and thresholds for a Nationally Significant Infrastructure Project under sections 14 and 15(2) of the Act, requiring consent for the building, commissioning and operating of a generating station with an energy generating capacity greater than 50 MWe.

1.2 The Project

1.2.1.1 The North Lincolnshire Green Energy Park (NLGEP) ('the Project'), located at Flixborough, North Lincolnshire, is a Nationally Significant Infrastructure Project (NSIP) with an Energy Recovery Facility (ERF) capable of converting up to 760,000 tonnes of non-recyclable waste into 95 MW of electricity at its heart and a carbon capture, utilisation and storage (CCUS) facility which will treat the excess gasses released from the ERF to remove and store carbon dioxide (CO₂) prior to emission into the atmosphere.

1.2.1.2 The NSIP incorporates a switchyard, to ensure that the power created can be exported to the National Grid or to local businesses, and a water treatment facility, to take water from the mains supply or recycled process water to remove impurities and make it suitable for use in the boilers, the CCUS facility, concrete block manufacture, hydrogen production and the maintenance of the water levels in the wetland area.

1.2.1.3 The Project will include the following Associated Development to support the operation of the NSIP:

- a bottom ash and flue gas residue handling and treatment facility (RHTF)
- a concrete block manufacturing facility (CBMF)
- a plastic recycling facility (PRF)

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- a hydrogen production and storage facility
- an electric vehicle (EV) and hydrogen (H2) refuelling station
- battery storage
- a hydrogen and natural gas above ground installations (AGI)
- a new access road and parking
- a gatehouse and visitor centre with elevated walkway
- railway reinstatement works including, sidings at Dragonby, reinstatement and safety improvements to the 6km private railway spur, and the construction of a new railhead with sidings south of Flixborough Wharf
- a northern and southern district heating and private wire network (DHPWN)
- habitat creation, landscaping and ecological mitigation, including green infrastructure and 65 acre wetland area
- new public rights of way and cycle ways including footbridges
- Sustainable Drainage Systems (SuDS) and flood defence; and
- utility constructions and diversions.

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1.2.1.4 The Project will also include development in connection with the above works such as security gates, fencing, boundary treatment, lighting, hard and soft landscaping, surface and foul water treatment and drainage systems and CCTV.

1.2.1.5 The Project also includes temporary facilities required during the course of construction, including site establishment and preparation works, temporary construction laydown areas, contractor facilities, materials and plant storage, generators, concrete batching facilities, vehicle and cycle parking facilities, offices, staff welfare facilities, security fencing and gates, external lighting, roadways and haul routes, wheel wash facilities, and signage.

1.2.1.6 The developer plans to start construction in 2023 and to complete construction in 2026.

1.2.1.7 The intent is that carbon dioxide released during the energy recovery process will be captured. The project will capture and use between 40,000 and 60,000 tonnes of carbon dioxide initially, carbon dioxide will be used in the onsite manufacture of concrete blocks. The East Coast Cluster, which has been selected as a 'Track 1' project for development by the mid-2020s, plans to install a carbon dioxide pipeline that will enable the long-term storage of compressed carbon dioxide under the North Sea is proposed to pass only a kilometre from the Project. The Applicant proposes connecting to the East Coast Cluster to enable the long-term storage of up to 650,000 tonnes of carbon dioxide per year.

1.2.1.8 The Project is accessible via rail, river and road. The railway connection between Flixborough Wharf and the steel works at Scunthorpe will be reinstated and a new railhead will be built to transport feedstocks to the Project. The Project will use Flixborough Wharf to transport feedstocks via the River Trent. A new access road from the A1077 and M181 motorway is also planned to improve access by road.

1.3 Purpose of this report

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1.3.1.1 The Overarching National Policy Statement for Energy (EN-1)¹ and the National Policy Statement for Renewable Energy Infrastructure (EN-3)² provide the primary basis for decisions on applications for nationally significant renewable energy infrastructure, including the Project³.

1.3.1.2 Generic issues are covered in EN-1 and EN-3 is concerned with matters specific to biomass, energy from waste, onshore and offshore wind energy, or where, there are further specific considerations arising from the technologies.

1.3.1.3 EN-3 (paragraphs 2.5.66 – 2.5.69) requires applicants to undertake

"An assessment of the proposed waste combustion generating station [...] that examines the conformity of the scheme with the waste hierarchy and the effect of the scheme on the relevant waste plan or plans where a proposal is likely to involve more than one local authority.

The application should set out the extent to which the generating station and capacity proposed contributes to the recovery targets set out in relevant strategies and plans, taking into account existing capacity."

"The results of the assessment of the conformity with the waste hierarchy and the effect on relevant waste plans should be presented in a separate document to accompany the application to the IPC."

1.3.1.4 The purpose of this document is therefore to demonstrate:

- there is sufficient fuel available for the Project
- the Project complies with the waste hierarchy; and
- the Project complies with local waste plans.

¹ "Overarching National Policy Statement for Energy (EN-1)", July 2011, UK Department of Energy and Climate Change

² "National Policy Statement for Renewable Energy Infrastructure (EN-3)", July 2011, UK Department of Energy and Climate Change

³ At the time of writing, the Government is consulting on revised National Policy Statements. The provisions relating to the waste hierarchy for EfW facilities are not expected to change.

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2 Market and regulatory overview

2.1.1.1 Waste management is a devolved matter and subject to local regulations in England, Scotland, Northern Ireland, and Wales. Each have somewhat different approach and targets. The legal framework for waste management in England remains largely unchanged after Brexit. Regulations in England are in line with the European Waste Framework Directive and are outlined in the Waste (England and Wales) Regulation 2011⁴ and the Resource and Waste Strategy for England⁵.

2.2 Waste (England and Wales) Regulations 2011

2.2.1.1 The Waste Regulations aim to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.

2.2.1.2 The Regulations establish the waste hierarchy as a priority order in waste prevention and management policy and set targets for the preparation for re-use, recycling, and recovery of household waste in 2020. The waste hierarchy is defined as follows:

- Prevention
- Preparation for re-use
- Recycling
- Other recovery (including energy recovery)
- Disposal

⁴ "Environmental Protection, England and Wales 2011 No.288 The Waste (England and Wales) Regulations 2011", March 2011, UK Government

⁵ "Resources and waste strategy for England", December 2018, Department for Environment, Food & Rural Affairs and Environment Agency

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2.3 Resource and Waste Strategy for England 2018

2.3.1.1 The Resource and Waste Strategy aims to preserve material resources by minimizing waste, promoting resource efficiency and moving towards a circular economy. It also sets strategies to minimize the damage caused to the environment by reducing and managing waste safely and carefully and by tackling waste crime.

2.3.1.2 It outlines a strategic ambition to eliminate avoidable waste of all kinds by 2050, and it outlines the following targets:

- 10% or less of municipal waste to landfill in 2035
- 65% recycling rate for municipal solid waste by 2035
- 75% recycling rate for packaging by 2030
- all plastic packaging to be reusable, recyclable or compostable by 2025 with 30% average recycled content across all plastic packaging

2.3.1.3 The Strategy recognizes that recycling rates have plateaued since 2013, with household waste recycling at 45%, and outlines a number of measures to improve recycling rates including ensuring a consistent set of dry recyclable materials to be collected from all household and businesses; ensuring every household and business has weekly separate food waste collection; and working with businesses and local authorities to improve urban recycling rates.

2.3.1.4 The strategy also outlines the need for greater efficiency in energy from waste facilities including increasing the use of heat and ensuring all future energy from waste facilities achieve recovery (R1) status.

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2.4 Waste Management Plan for England 2021

2.4.1.1 An analysis of the current waste management situation in England is detailed in the Waste Management Plan for England⁶. The Plan recognizes that in order to deliver net zero virtually all heat will need to be decarbonised, and heat networks will play a vital role in this. The Plan targets energy from waste plants to produce heat for heat networks, with £320 million of government funding through the Heat Networks Investment Project and support from the BEIS's £270 million Green Heat Network Fund Transition scheme.

2.5 Environment Bill

2.5.1.1 The Environment Act 2021 requires the Secretary of State to set long-term, legally binding targets in four areas, one of which is resource efficiency and waste reduction.

2.5.1.2 The resource efficiency and waste reduction targets are intended to encourage sustained improvement across the whole resources and waste system, while strengthening and supporting commitments made in other government strategies. Targets currently under consideration are increasing resource productivity and reducing the volume of 'residual' waste we generate. The Act also creates the powers necessary to deliver the commitments in the Resource and Waste Strategy, for example the introduction of greater consistency in recycling collections in England.

2.6 Committee on Climate Change 2021

2.6.1.1 The 2021 Progress Report⁷ from the Committee on Climate Change (CCC) provides an assessment of UK's progress in reducing emissions and adapting to climate change.

2.6.1.2 The report identifies key gaps in the waste sector that need to be addressed in government policy and calls for stronger commitments on waste and resource efficiency, including recommendations to:

- raise recycling targets for England from 65% by 2035 to at least 68% by 2030; and

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- ban biodegradable waste streams such as paper, card, textiles, wood, food and garden waste from landfill from 2025.
- 2.6.1.3 The CCC stresses that the government must take a whole system approach to improve waste prevention, re-use and recycling. This includes encouraging investment in recycling and re-use services and infrastructure to ensure that, as much as possible, waste is not diverted from landfill to energy from waste plants; and phasing out exports of waste by 2030 at the latest while strengthening tracking and enforcement, to ensure waste intended for recycling or recovery are treated as such.
- 2.6.1.4 Further recommendations from CCC relate to the emissions from the energy from waste segment, specifically:
- set out capacity and utilisation requirements which are consistent with plans to improve recycling and waste prevention, by the end of 2021,
 - consult on the introduction of a carbon price on energy from waste emissions (either as part of the UK Emissions Trading System (ETS) or a separate carbon tax), by the end of 2022,
 - provide the necessary support to enable existing plants to begin to be retrofitted with carbon capture, usage and storage (CCUS) from the late 2020s; and
 - introducing policy to ensure that any new plants are built either with CCUS or are 'CCUS ready'.

⁶ "Waste Management Plan for England", January 2021, UK Department for Environment, Food and Rural Affairs

⁷ "Progress in reducing emissions 2021 Report to Parliament" and "Progress in adapting to climate change 2021 Report to Parliament", June 2021, Climate Change Committee

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2.7 Carbon Capture, Usage, and Storage (CCUS) Policy

2.7.1.1 In its Net Zero Strategy⁸, the Government has set out its proposal to deliver four CCUS clusters by 2030. Following Phase 1 of the Cluster Sequencing Process, the East Coast Cluster has been selected as one of the two Track 1 clusters for the mid-2020s and will be taken forward into Track 1 negotiations. If the clusters represent value for money for the consumer and the taxpayer then subject to final decisions of Ministers, they will receive support under the government's CCUS Programme.

2.7.1.2 The East Coast Cluster spans the Teesside and Humber area. The East Coast Cluster is comprised of the Net Zero Teesside and Zero Carbon Humber consortia of industrial partners. The Humber branch will feature a carbon dioxide pipeline running from Drax Power Station via Keadby Power Station to Immingham. The exact route for this is not yet known, but it will be close to the Project site given that Flixborough is only a few kilometers from Keadby.

2.8 UK Plan for Shipments of Waste

2.8.1.1 New regulations on the shipments of waste will likely create some availability of waste which can be consumed domestically.

2.8.1.2 The UK Plan for Shipments of Waste⁹ implements the UK government policy of self-sufficiency in waste disposal by prohibiting trade of waste to and from the UK for disposal. This was last updated in 2012 and it is currently due another update in order to reflect certain policy and minor technical changes. The Environment Agency (EA) is the competent authority responsible for regulating waste shipments for England. The government has committed to banning the export of plastic waste to countries that are not members of the OECD and will consult on the date by which this should be achieved.

⁸ "Net Zero Strategy: Build Back Greener", October 2021, UK Department for Business, Enterprises, and Industrial Strategy

⁹ "Draft Updated UK Plan for Shipments of Waste", January 2021, UK Department for Environment, Food and Rural Affairs

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3 RDF and residual waste assessment

3.1.1.1 This assessment evaluates the availability of fuel for the Project, based on the assumption that the Project will be fuelled by waste that would otherwise be managed at a lower level of the waste hierarchy or exported for energy recovery outside of the UK.

3.1.1.2 Separate analysis conducted for the Project¹⁰ estimates that in 2019, 2.9 million tonnes of general waste were received by landfill sites within 100 miles of the Project. Of which, 866,000 tonnes were received by landfill sites in North Lincolnshire and within 25 miles of the Project. The most significant landfill site is the Roxby Landfill operated by Biffa Waste Services. This site alone received 844,000 tonnes of general waste in 2019, tonnages steadily increased between 2017 and 2019.

3.2 Catchment area

3.2.1.1 The assessment covers the whole of England. The Project has both rail and river access and therefore RDF and residual waste could feasibly be collected from regions across the country.

3.2.1.2 The Project is situated within Yorkshire and Humber and majority of the Yorkshire and Humber and East Midlands regions are within 100 miles of the Project. The assessment also evaluates the availability of RDF and residual waste at a regional level, including the Yorkshire and Humber and East Midlands regions.

3.3 Types of waste

3.3.1.1 The assessment includes household waste and commercial and industrial waste (C&I).

¹⁰ "North Lincolnshire Green Energy Park: Regional Waste Assessment", August 2021, Footprint Services

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3.3.1.2 Household waste is based on the EC definition “waste generated by households” (Commission Decision 2011/753/EU, Article 1(1)¹¹) and “similar waste” as “waste in nature and composition comparable to household waste, excluding production of waste and waste from agriculture and forestry”. Household waste collected by local authorities includes waste street bins, street sweepings, and parks and grounds. It does not include metals from incinerator bottom ashes. European Waste Catalogue (EWC) codes included in the household waste are listed in Appendix A.2.

3.3.1.3 C&I waste excludes EWC chapter 01 mine and quarry wastes, chapter 17 construction and demolition wastes and chapter 19 waste and water treatment wastes as well as waste code 02 01 08* agrochemical waste containing hazardous substances. EWC codes and sectors included in C&I are listed in Appendix A.3.

3.4 Data sources

3.4.1.1 Household waste data is from the WasteDataFlow database, a UK-wide system managed by Department for Environment, Food and Rural Affairs (Defra) together with Devolved Administration partners to record the collection, treatment, and disposal of waste from local authorities. Question Structure for Treatment and Disposal Questions (Q100) was used to understand the detailed waste treatment practices from local authorities.

3.4.1.2 Data for C&I waste is based on the Waste Data Interrogator also published by Defra. The data collection methodology for household and C&I waste from Defra is used to analyse the data.

3.5 Household and commercial waste arisings

3.5.1.1 The most recent figures for total household and C&I waste relate to 2019. These figures are presented in the following section alongside the previous two years. The waste treatment classifications are based on the definitions provided in the EU Waste Framework Directive 2008/98¹² and are presented in Appendix A.3.

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3.5.2 England

3.5.2.1 In England household waste totalled 25 million tonnes in 2019. Annual household waste arisings have been broadly constant between 2017 and 2019 (Table 1).

3.5.2.2 The greatest volume is incinerated, 45% of total household waste, closely followed by recycling, 43%. Between 2017 and 2019, the volume of waste going to recycling and composting have been stable, while the volume of waste treated by incineration has increased by 7%. Landfill has steadily declined from 3.5 million tonnes to 2.3 million tonnes, with most of this volume moving to incineration.

Table 1 - Historical household waste in England

Year	Waste collected								
	Incineration		Landfill		Other ¹³		Recycling and composting		Total
	kt	%	kt	%	kt	%	kt	%	kt
2017	10,660	42%	3,488	14%	449	2%	10,818	43%	25,415
2018	11,180	44%	2,890	12%	525	2%	10,533	42%	25,128
2019	11,478	45%	2,281	9%	769	3%	10,752	43%	25,280

Source: WasteDataFlow

¹¹ "Commission Decision 2011/753/EU, Article 1(1)", November 2011, European Commission

¹² "EU Waste Framework Directive 2008/98", November 2008, European Union

¹³ Other treatment includes waste which were treated or disposed of through other unspecified methods as well as process and moisture loss.

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3.5.2.3 C&I waste in England amounted to 36 million tonnes in 2019. Annual commercial and industrial waste arisings have been relatively stable between 2017 and 2019 (Table 2).

3.5.2.4 The greatest volume was sent to recycling and composting, 61%. 10% was sent to landfill and 2% incinerated. Other disposal, which includes biological treatment resulting in material which is discarded by disposal such as landfill, and blending, mixing or storage prior to disposal by for example landfill. Other recovery includes storage of wastes pending energy recovery, recycling, or composting. The description and classification of disposal and recovery operations can be found in Appendix A.3 (Tables 4 & 5).

Table 2 - Historical commercial and industrial waste in England

Year	Waste collected										
	Incineration		Landfill		Other disposal ¹⁴		Recycling and composting		Other recovery ¹⁵		Total
	kt	%	kt	%	kt	%	kt	%	kt	%	kt
2017	894	3%	4,514	13%	7,960	22%	19,089	54%	3,098	9%	35,555
2018	962	3%	4,623	13%	5,419	15%	21,811	59%	3,843	10%	36,658
2019	880	2%	3,561	10%	5,518	15%	21,664	61%	4,178	12%	35,800

Source : Environment Agency's Waste Data Interrogator

¹⁴ Other disposal includes disposal operation codes which are listed in Appendix A.3: Table 5 – Disposal operations as defined in the EU Waste Framework Directive

¹⁵ Other recovery includes recovery operation codes which are listed in Appendix A.3: Table 4 – Recovery operations as defined in the EU Waste Framework Directive

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3.5.3 Yorkshire and Humber and East Midlands

3.5.3.1 In 2019, 5.3 million tonnes of household waste were collected in Yorkshire and Humber and East Midlands. Household waste arisings have reduced by just over 1% per year between 2017 and 2019.

3.5.3.2 The greatest volume of waste was sent to recycling, 47%, 39% was incinerated and 9% was landfilled. Among all regions in England, East Midlands had the largest share of household waste sent to landfill.

Table 3 - Historical household waste in Yorkshire & Humber and East Midlands

Year	Waste collected								
	Incineration		Landfill		Other		Recycling and composting		Total
	kt	%	kt	%	kt	%	kt	%	kt
2017	1,937	35%	633	12%	87	2%	2,802	51%	5,460
2018	2,074	39%	517	10%	123	2%	2,656	49%	5,369
2019	2,091	39%	453	9%	259	5%	2,503	47%	5,305

Source: WasteDataFlow

3.5.3.3 In 2019, C&I waste in Yorkshire and Humber and East Midlands amounted to 9 million tonnes. 61% of which was sent to recycling and 9% was landfilled.

Table 4 - Historical commercial and industrial waste collected and treated in Yorkshire and Humber and East Midlands

Year	Waste collected										
	Incineration		Landfill		Other disposal		Recycling and composting		Other recovery		Total
	kt	%	kt	%	kt	%	kt	%	kt	%	kt
2017	173	2%	1,351	16%	1,663	19%	4,470	52%	899	11%	8,555
2018	228	3%	1,177	13%	1,151	13%	5,421	60%	1,067	12%	9,046
2019	221	2%	770	9%	1,360	15%	5,457	61%	1,208	13%	9,016

Source: Environment Agency's Waste Data Interrogator

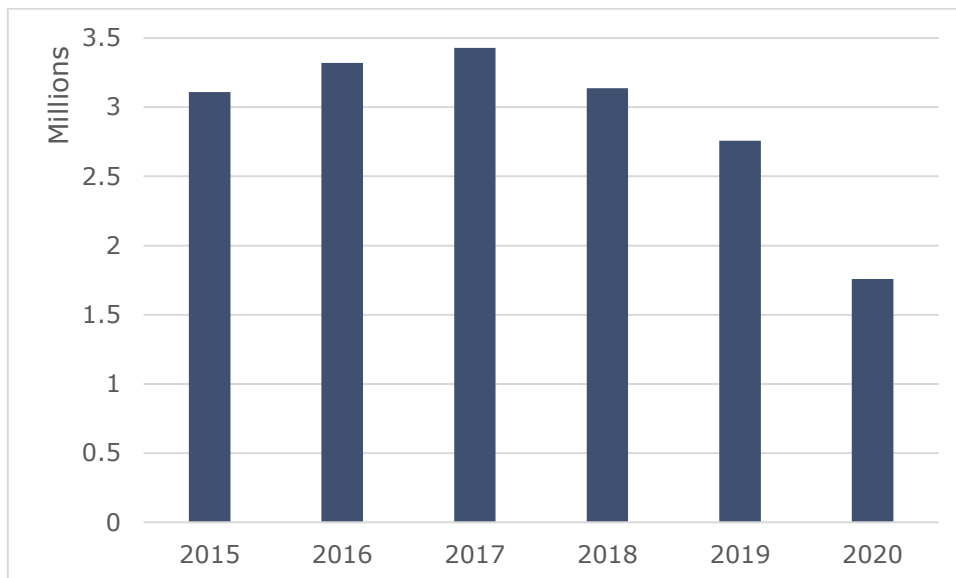
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3.5.4 RDF Exports

3.5.4.1 England exports RDF and solid recovered fuel (SRF) for energy recovery overseas. The volume of RDF and SRF exported from England has rapidly declined since 2017 (Figure 1).

3.5.4.2 The majority of the recent decline has been in exports to the Netherlands, previously the largest export country for RDF and SRF from England. The Netherlands introduced a tax on imported wastes, including RDF, in 2020 intended to help achieve its GHG emission targets. Since then, RDF import to the Netherlands has declined dramatically and the Dutch government expects RDF imports to “evaporate completely” in three years as the tax raises the total cost of waste incineration in the Netherlands above the average price in competing countries.

Figure 1 – Historical RDF and SRF exports from England (Mt)



Source: “RDF Activity Report”, April 2021, Footprint Services

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3.5.5 Summary of RDF and residual waste disposal routes

3.5.5.1 In summary, the total volume of household and relevant commercial and industrial waste sent to landfill and other disposal routes in England was 11.4 million tonnes in 2019, of which 2.6 million tonnes were generated in Yorkshire & Humber and East Midlands.

3.5.5.2 In total, 23.7 million tonnes of waste generated in England was managed by disposal or recovery options in 2019. These volumes, that are at the recovery and disposal level of the waste hierarchy are of relevance to this assessment.

Table 5 – Summary of RDF and residual waste disposal routes (kT)

	England	Yorkshire & Humber and East Midlands
Household waste to landfill	2,281	453
C&I waste to landfill	3,561	770
Total waste to landfill	5,842	1,223
C&I waste to incineration without energy recovery	31	5
C&I waste to other disposal routes*	5,484	1,347
Total waste to landfill and disposal	11,358	2,575
RDF exports (2020/21)	1,574	377
Household waste to incineration with energy recovery	11,478	2,091
C&I waste to incineration with energy recovery	848	216
Total residual waste and RDF exports	23,684	4,882

* Other disposal routes include biological treatment resulting in material which is discarded by disposal such as landfill, and blending, mixing or storage prior to disposal, by for example landfill.

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3.6 Household and commercial waste projections to 2035

3.6.1.1 This section estimates future household and C&I waste arising to 2035 and the volume of residual waste that will require treatment other than preparation for re-use and recycling.

3.6.1.2 For household waste, population growth and historic trends in the waste generated per person are used to calculate the future volumes. While recycling rates for household waste have plateaued at under 45% since 2017, waste strategies at national and local levels commit to increase recycling rates to 65% by 2035 and national and local waste plans outline many activities which aim to help England reach this ambitious target. In this projection, it is assumed that the recycling rate gradually increase to reach 65% in 2035.

3.6.1.3 C&I waste is projected forward in line with economic growth in the commercial and industrial sectors, measured by gross value added (GVA). Recycling rates for C&I waste are assumed to reach 70% by 2035.

3.6.1.4 The detailed methodology and assumptions can be found in Appendix A.1.

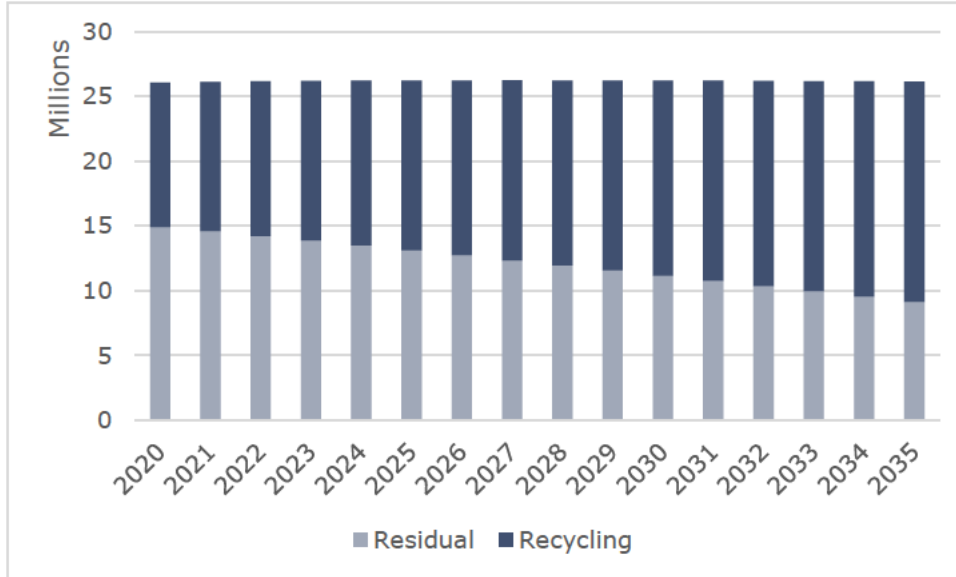
3.6.2 England

3.6.2.1 In our estimate increases in population and reduction in waste generated per person, mean that total household waste will remain at around 26 million tonnes until 2035.

3.6.2.2 Assuming England reaches its 2035 recycling target of 65%, residual waste could decline from around 15 million tonnes in 2020 to around 9 million tonnes in 2035.

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Figure 2 – Household waste arising outlook in England (Mt)

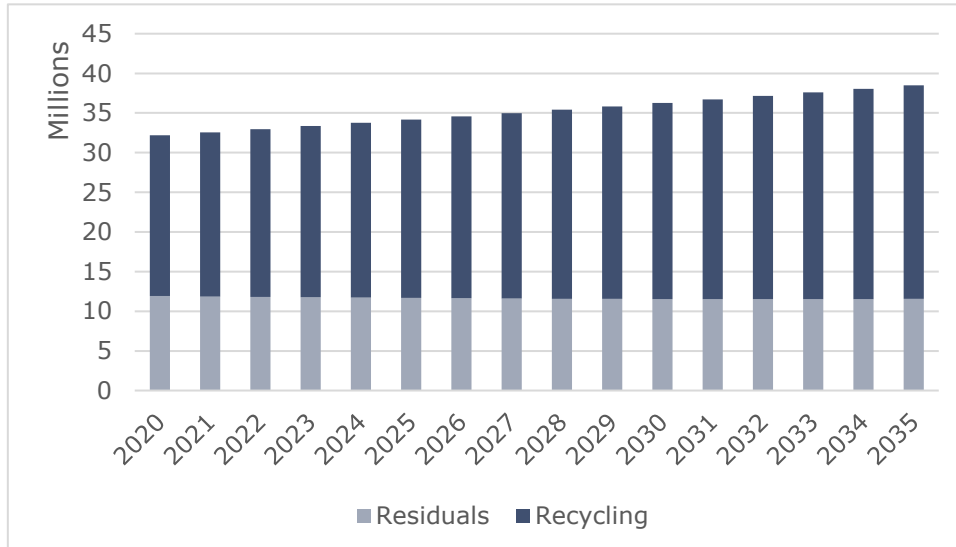


Source: ARFY estimate

3.6.2.3 In 2020, the total C&I waste in England has decreased by 10.1% (32 million tonnes in 2020) due to the impact of the pandemic. However, it is expected that there will be annual growth of 1.2% from 2021 onwards reaching 38.5 million tonnes in 2035. Residual waste is expected to remain at around 11 million tonnes until 2035.

Report

Figure 3 – Commercial and industrial waste arising outlook in England (Mt)



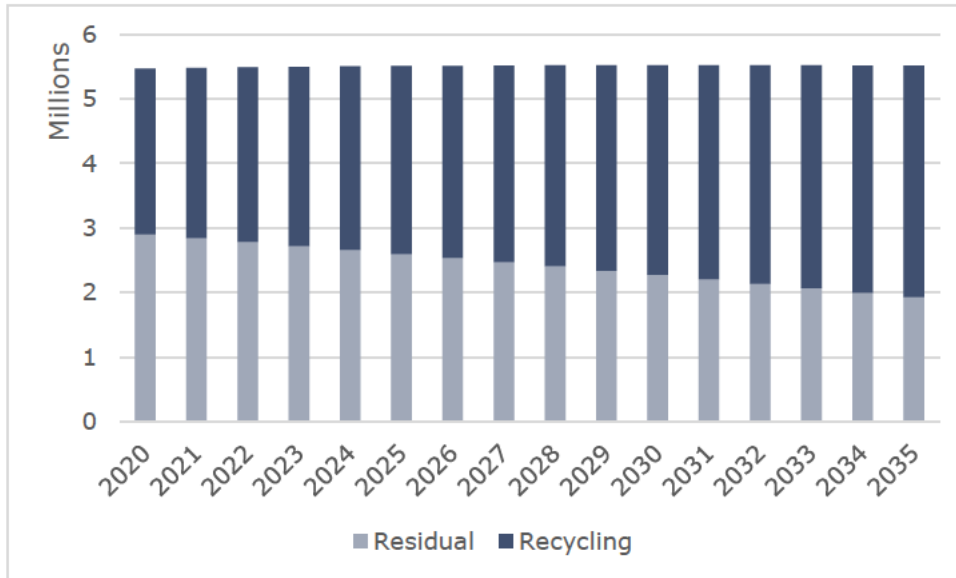
Source: AFRY estimate

3.6.3 Yorkshire and Humber and East Midlands

3.6.3.1 Among all the regions in England, East Midlands is expected to have the highest population increase across this time period, at more than 1 million. Household waste in Yorkshire and Humber and East Midlands is expected to increase by 0.04 million tonnes by 2035. Residual household waste is estimated to reduce by 0.9 million tonnes by 2035.

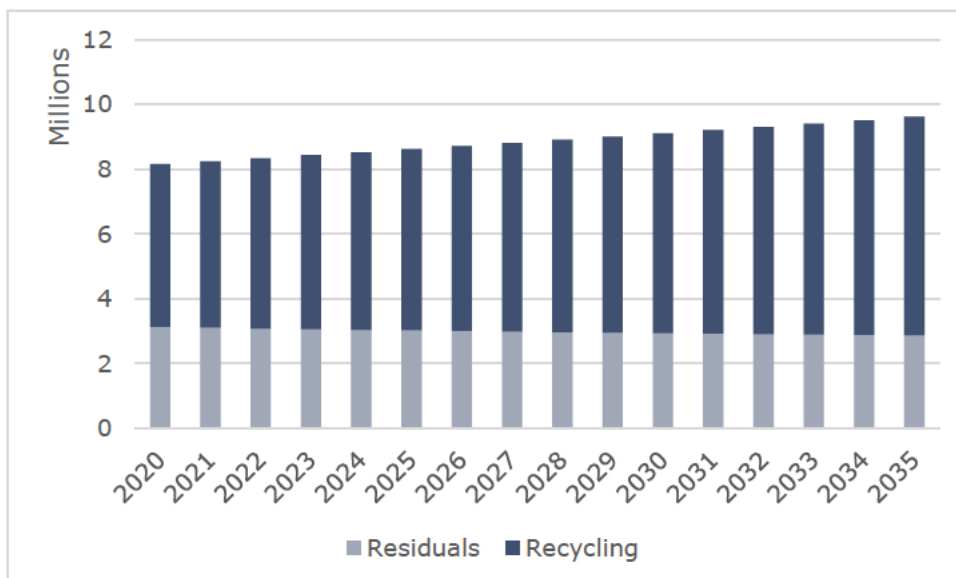
Report

Figure 4 – Household waste arising outlook in Yorkshire & Humber and East Midlands (Mt)



3.6.3.2 C&I waste is estimated to reach 4.5 million tonnes in 2035, an increase of 0.7 million tonnes from 2020. Residual waste is estimated at 1.4 million tonnes in 2035, a reduction of 0.5 million tonnes from 2020.

Figure 5 – Commercial and industrial waste arising outlook in Yorkshire and Humber and East Midlands (Mt)



Report

3.7 Residual waste treatment capacity

3.7.1.1 This section considers residual waste treatment capacity that is operational and under development and estimates how much residual waste cannot be processed by energy recovery facilities in England, the so-called capacity gap.

3.7.2 Treatment capacity and the capacity gap

3.7.2.1 At the time of writing there are 44 energy recovery facilities operating in England with a total headline capacity of 13.6 million tonnes of RDF, SRF and unprocessed residual waste. Between 2018 and 2020 these plants reported treating on average 12.2 million tonnes of waste per year according to annual performance reports¹⁶. Three of these plants are expected to cease operating before 2030. As a result, existing energy recovery facilities are estimated to process 11.3 million tonnes of residual waste in 2026 and 11.1 million tonnes in 2035. Existing MBT processes remove an additional 1.9 million tonnes of residual waste per annum¹⁷. This figure is not expected to change over the study period.

3.7.2.2 There are an additional 12 energy recovery projects that are reported to have reached financial close and are in commissioning or under construction, with headline capacity of 3.3 million tonnes per year¹⁸. Assuming an average construction time of 2-4 years, these projects are expected to process an additional 3.0 million tonnes of residual waste per year by 2026.

3.7.2.3 Based upon these operational and soon to be operational facilities, despite ambitious recycling targets for England, there could still be 8.2 million tonnes of residual waste in England without access to recovery in England in 2026. Within Yorkshire & Humber and East Midlands, there could be 2.2 million tonnes of residual waste unable to access to recovery facilities in 2026 (Table 6).

¹⁶ "UK Energy from Waste Statistics – 2020", May 2021, Tolvik Consulting

¹⁷ WIPD Infrastructure facilities list, UK Government database

¹⁸ EWB Plant Tracker, May 2021, ENDS Waste & Bioenergy

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Table 6 – 2026 Forecast of future RDF and residual waste arisings (kT)

Tonnes	England	Yorkshire & Humber and East Midlands
Household residual waste forecast	12,735	2,421
Residual C&I waste forecast	11,629	3,010
Total residual waste	24,364	5,431
MBT removal	1,902	344
Operational EfW	11,301	2,208
Under construction EfW	3,011	694
Total treatment capacity	16,214	3,246
CAPACITY GAP	8,150	2,185

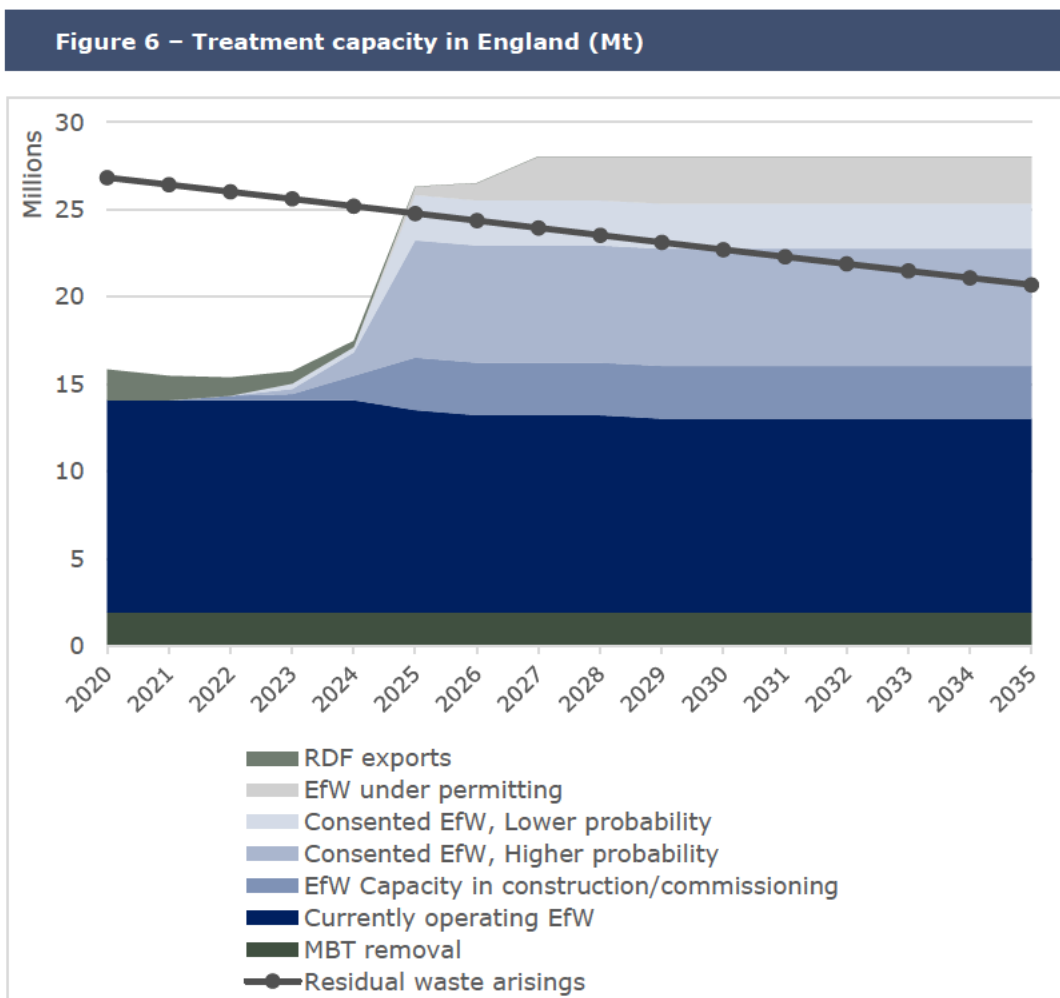
3.7.2.4 To 2035, the amount of residual waste requiring recovery is expected to reduce as national and regional waste strategies and plans reduce waste generation and move waste up the waste hierarchy. However, even if the ambitious recycling targets are met, there could still be up to 4.7 million tonnes of residual waste in England without access to recovery operations within England. Within Yorkshire & Humber and East Midlands, there could be up to 1.6 million tonnes of waste without access to recovery operations in the regions (Table 7).

Table 7 – 2035 Forecast of future RDF and residual waste arisings (kT)

Tonnes	England	Yorkshire & Humber and East Midlands
Household residual waste forecast	9,142	1,930
Residual C&I waste forecast	11,547	2,885
Total residual waste	20,689	4,815
MBT removal	1,902	344
Operational EfW	11,116	2,208
Under construction EfW	3,011	694
Total treatment capacity	16,029	3,246
CAPACITY GAP	4,660	1,570

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3.7.2.5 There are several energy recovery projects under development in England. After an analysis of the Renewable Energy Planning Database¹⁹ and ENDS Plant Tracker²⁰, 32 projects were identified that have been consented by the relevant authority and are under active development in our view, these are listed in Appendix A.4. There is a high level of uncertainty around how many of these projects will be successfully realized. Figures 6 & 7 provide an illustration of different scenarios for residual waste treatment capacity to 2035.



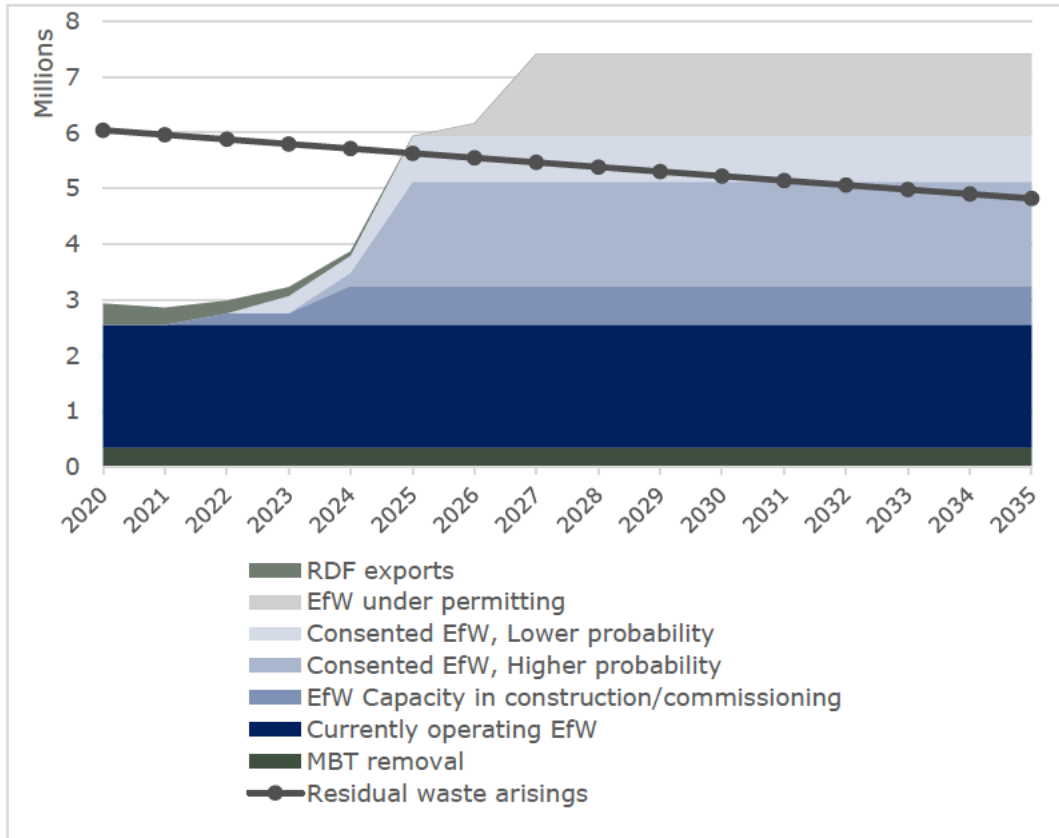
Source: AFRY estimate

¹⁹ "Renewable Energy Planning Database", Eunomia Research and Consulting Ltd on behalf of Department for Business, Energy and Industrial Strategy.

²⁰ EWB Plant Tracker, May 2021, ENDS Waste & Bioenergy.

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Figure 7 – Treatment capacity in Yorkshire & Humber and East Midlands (Mt)



Source: AFRY estimate

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3.8 UK commitments to Net Zero

3.8.1.1 In June 2019 UK Government increased the UK's legislated target for GHG emissions reductions from at least 80% by 2050 to 100%. The target means that all activities will need to move to emitting as close to zero emissions as possible by 2050, with the remaining emissions removed from the atmosphere. As a result, the UK's climate objectives must be integrated into all policy making.

3.8.1.2 Waste accounted for 4% of UK GHG emission in 2019, as emissions reductions have stalled in recent years following a period of steep emission reductions due to the diversion of waste from landfill. In 2021 the CCC recommended that UK Government address with urgency the rising emissions from energy recovery facilities²¹. Specifically:

- ensuring that the use of energy from waste is consistent with necessary improvements in recycling and resource efficiency
- providing support to enable existing energy from waste plants to begin to be retrofitted with CCUS from the late 2020s; and
- introducing policy to ensure that any new energy from waste plants are built either with CCUS or are 'CCUS ready'.

3.8.1.3 In addition, the CCC recommend implementing the following targets on waste within the Environment Bill:

- banning landfilling of municipal and non-municipal biodegradable wastes from 2025; and
- setting a target for a 68% recycling rate by 2030 covering all waste in England.

²¹ "Progress in Reducing Emissions, 2021 Report to Parliament", Climate Change Committee

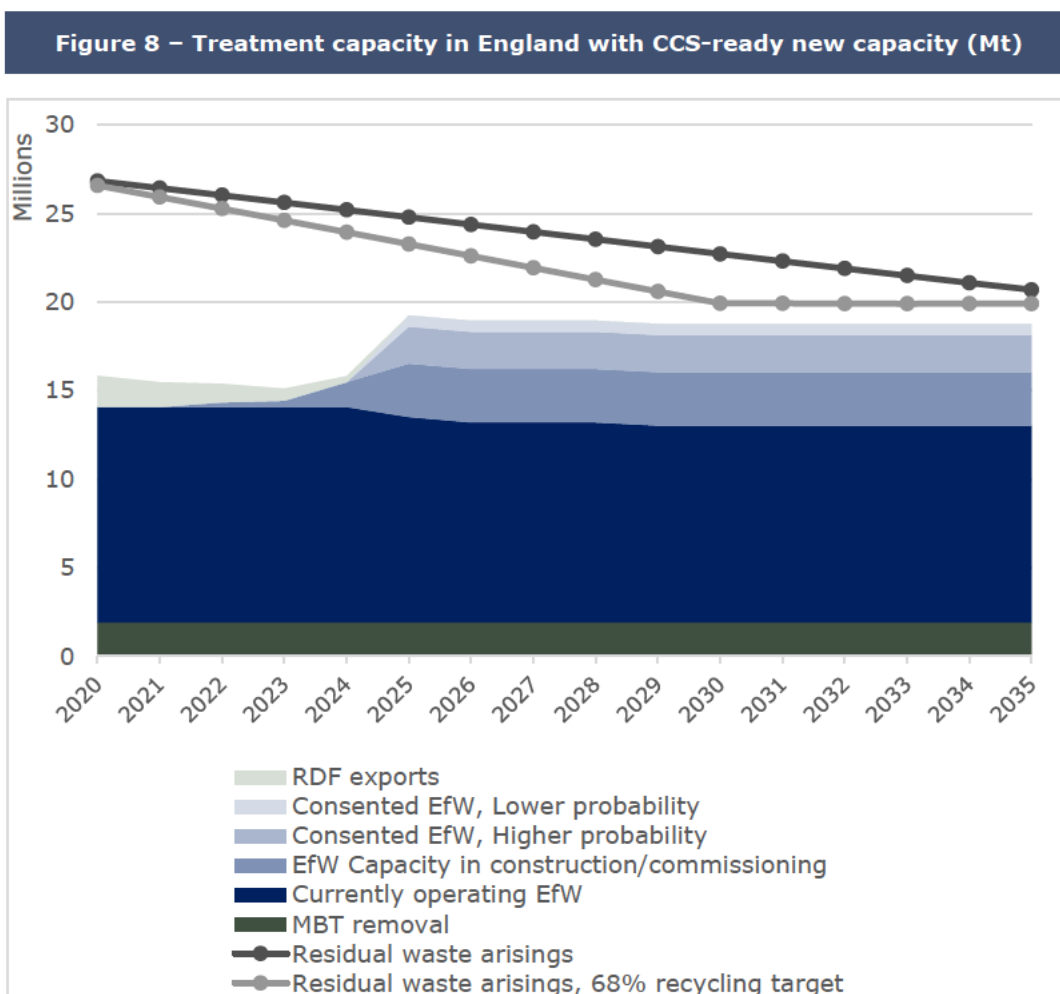
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- 3.8.1.4 The Project includes CCU and will be CCUS-enabled, with plans to accommodate carbon capture technology and plans to connect to Zero Carbon Humber to enable the long-term storage of carbon dioxide. Zero Carbon Humber is a consortium of energy and industrial companies operating in the Humber region in the North East of England working together to deliver region-wide infrastructure to enable CCUS. The Zero Carbon Humber project is part of the East Coast Cluster coalition (along with Net Zero Teesside) which has been selected as a 'Track 1' project for development by the mid-2020s (subject to negotiation with the Government).
- 3.8.1.5 Central to Zero Carbon Humber plans is a carbon dioxide pipeline that will enable compressed carbon dioxide to be stored under the North Sea. The pipeline will run from Drax Power Station via Keadby Power Station to Immingham and Hull. The exact route for this is not yet known, but it will be close to the Project site given that Flixborough is only a few kilometers from Keadby. The Project therefore provides an opportunity to treat residual waste not suitable for re-use or recycling in a way that is consistent with the UK's Net Zero commitments.
- 3.8.1.6 In order to determine how requirements for CCUS-readiness could impact the development of residual waste treatment capacity in England, we have made an assessment of consented energy from waste projects. Potential for CCUS was determined by proximity to a major CCS cluster identified in the UK industrial decarbonisation strategy.²² Another consideration for CCS potential is whether a site has adequate space for the carbon dioxide capture and compression equipment, but due to limited access to information on consented projects, only the proximity criteria was used in this analysis. Cut-off criteria used for proximity was 10 miles from a hub identified in plans for major CCS cluster (Humberside, Teesside, Merseyside, Southampton).

²² "Industrial Decarbonisation Strategy", Policy paper, Department for Business, Energy, & Industrial Strategy

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3.8.1.7 Figure 8 illustrates the scenarios on capacity development in England, in which new capacity is restricted to projects that have the potential to include CCS. In addition to previously presented residual waste arisings projection, a more ambitious residual waste projection reaching the target of 68% recycling rate by 2030 is presented (in line with the CCC's recommendation).



Source: AFRY estimate

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3.9 Summary

- 3.9.1.1 This analysis indicated that in a scenario in which England meets its existing recycling targets, an additional 4.7 million tonnes of recovery capacity is required to ensure that residual waste that cannot be recycled can be processed for energy recovery in 2035.
- 3.9.1.2 While a considerable amount of energy from waste capacity has been consented, there is a high level of uncertainty about how much of this capacity will be realised. If new build energy from waste is required to be CCUS-ready in order to align with the UK's Net Zero commitments, then the Project is among the small minority of pipeline projects which are well placed to connect to a CCUS cluster.

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4 Compliance with local waste plans

4.1.1.1 North Lincolnshire Council's Waste Strategy was published in 2012. The Strategy aims to limit the growth of municipal waste through waste reduction and minimization programmes and increase the level of recycling and composting to a minimum of 60% of household waste.

4.1.1.2 The Strategy aspires to treat residual waste not suitable for recycling in facilities located within North Lincolnshire using energy recovery and public consultations by the council showed strong support from the public for treating non-recyclable waste in a recovery facility within North Lincolnshire. The Strategy recognises the area as an ideal place to locate a waste management facility, as there is abundance of brown-field sites together with well-developed power transmission infrastructure and transport links. Furthermore, as the region has relatively low volume of waste arisings compared to scale of many facilities, the council acknowledges that waste management facilities within North Lincolnshire could treat additional waste from other regions.

4.1.1.3 The North Lincolnshire Local Development Framework contains waste planning related policies and identifies locations in which a waste management facility could be located. Broad strategic areas for waste management and treatment are Scunthorpe, South Humber Bank employment area, Flixborough Industrial Estate, and power station sites and farms directly using products derived from waste treatment. The Project is located within one of the identified areas.

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- 4.1.1.4 A new North Lincolnshire Local Plan is under development and the Publication Plan was published for final consultation on 15 October 2021. The Local Plan sets out the Council's strategic planning framework and principles for sustainable waste management. It states that the Council seek to move the management of all waste streams up the waste hierarchy and to ensure there are more opportunities for recovery and recycling of waste across the area. Policy WAS1: Waste Management Principles states that the Council will ensure sufficient capacity is located within the area to accommodate forecast waste arisings, and that they will facilitate the development of a network of local waste management facilities and effective methods of waste management. Policy WAS2: Waste Facilities states that proposals for energy from waste facilities will be supported provided they meet the criteria set out in the policies for Waste Facilities and Renewable Energy Proposals. Furthermore, the Local Plan recognises that there may be a need for additional capacity as waste moves up the waste hierarchy to have less reliance on disposal.
- 4.1.1.5 Neighbouring authorities in the Yorkshire & Humber and East Midlands are in the process of updating their waste management strategies, but it is expected that local plans will continue to focus on fulfilling the targets set at national level, especially the targets on increasing recycling rate and diverting more waste from landfill. Many neighbouring councils are open to liaise with other areas to utilise their waste management capacities and allow the movement of waste between regions.

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4.2 Summary

- 4.2.1.1 The Project meets the objectives of the local waste plans, as the facility will take RDF feedstock made from residual waste previously subject to recycling at a separate collection or MRF facility. Hence the production of feedstock to be recovered in the facility will not negatively influence recycling targets. Energy from waste using RDF feedstock is a recovery option consistent within the principles of the waste hierarchy as it diverts waste from landfill, the recyclable materials have been extracted from the feedstock and the operation has flexibility in terms of calorific value and waste composition of its feedstock.
- 4.2.1.2 The Project site at Flixborough Industrial Estate is aligned with the local council's strategy where the site is identified as suitable for a waste management facility.

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5 Summary and conclusions

- 5.1.1.1 This analysis indicated that in a scenario in which England meets its existing recycling targets, an additional 4.7 million tonnes of recovery capacity is required to ensure that residual waste that cannot be recycled can be processed for energy recovery in 2035.
- 5.1.1.2 While a considerable amount of energy from waste capacity is under development, there is a high level of uncertainty about how much of this capacity will be realised. If new build energy from waste is required to be CCUS-ready in order to align with the UK's Net Zero commitments, then the Project is among the small minority of pipeline projects which are well placed to connect to a CCUS cluster.
- 5.1.1.3 The Project meets the objectives of the North Lincolnshire Council's Waste Strategy, as the facility will take RDF feedstock made from residual waste previously subject to recycling at separate collection or MRF facility, and so the production of feedstock to be recovered in the facility will not negatively influence recycling targets. Energy from waste using RDF feedstock is a recovery option consistent with the principles of the waste hierarchy as it diverts waste from landfill, the recyclable materials have been extracted from the feedstock and the operation has flexibility in terms of calorific value and waste composition of its feedstock.
- 5.1.1.4 The Project site at Flixborough Industrial Estate is aligned with the local council's strategy where the site is identified as suitable for a waste management facility.

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Appendix A

A.1 Waste projection

For household waste, the development of population out to 2050 as well as the forecast of waste generated per person were used to calculate the waste generated in the future. 4% reduction of waste generated per person is assumed until 2030. The projection also assumes that the recycling target of 65% is met by 2035 and keeps the same proportion until 2050.

The projection for commercial and industrial waste is based on Gross Value Added (GVA) which is the value generated by any unit engaged in the production of goods and services as well as the forecast of economic growth. The projection includes the assumption of 70% recycling in 2035 and until 2050.

Table 1 – Economic growth forecast assumptions

Region	GVA (real terms) annual increase from 2019 to 2020	GVA (real terms) annual increase from 2021 to 2030
England	-10.1%	+1.2%
East Midlands	-10.0%	+1.1%
Yorkshire and Humber	-9.0%	+1.1%

Source: "Briefing Paper, Regional and country economic indicators", May 2021, House of Commons Library 2021

A.2 Household waste

Table 2 – Waste included in the household waste according to the EWC codes

Waste materials	Waste code according to Decision 2000/532/EC
Paper and cardboard	20 01 01, 15 01 01
Metals	20 01 40, 15 01 04
Plastic	20 01 39, 15 01 02
Glass	20 01 02, 15 01 07
Biodegradable kitchen and canteen waste	20 01 08
Biodegradable garden and park waste	20 02 01
Non-biodegradable garden and park waste	20 02 02, 20 02 03
Wood	20 01 38, 15 01 03
Textiles	20 01 10, 20 01 11, 15 01 09

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Batteries	20 01 34, 20 01 33*
Discarded equipment	20 01 21*, 20 01 23*, 20 01 35*, 20 01 36
Other municipal waste	20 03 01, 20 03 02, 20 03 03, 20 03 07, 15 01 06

Source: "Decision 2000/532/EC", May 2000, European Commission

A.3 Commercial and industrial waste

The C&I waste arisings exclude EWC chapter 01 (Mine and quarry wastes), 17 (construction and demolition wastes) and 19 (waste and water treatment wastes) as well as waste code 02 01 08* (agrochemical waste containing hazardous substances).

Sites categorised as "Transfer" are also excluded in order to avoid double counting between sites.

Table 3 – Waste included in the C&I waste according to the EWC codes

EWC Chapter	Description	Notes
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	20 01 08* excluded
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	
04	Wastes from the leather, fur and textile industries	
05	Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal	
06	Wastes from inorganic chemical processes	
07	Wastes from organic chemical processes	
08	Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	
09	Wastes from the photographic industry	
10	Wastes from thermal processes	
11	Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy	
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	
13	Oil wastes and wastes of liquid fuels (except edible oils, 05 and 12)	
14	Waste organic solvents, refrigerants and propellants (except 07 and 08)	
15	Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	
16	Wastes not otherwise specified in the list	
18	Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)	
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	

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Table 4 – Recovery operations as defined in the EU Waste Framework Directive 2008/98

Treatment	R & D code	Description
Incineration	R1	Use principally as a fuel or other means to generate energy
Recycling and composting	R2	Solvent reclamation/regeneration
Recycling and composting	R3	Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
Recycling and composting	R4	Recycling/reclamation of metals and metal compounds
Recycling and composting	R5	Recycling/reclamation of other inorganic materials
Recycling and composting	R6	Regeneration of acids or bases
Recycling and composting	R7	Recovery of components used for pollution abatement
Recycling and composting	R8	Recovery of components from catalysts
Recycling and composting	R9	Oil re-refining or other reuses of oil
Recycling and composting	R10	Land treatment resulting in benefit to agriculture or ecological improvement
Recycling and composting	R11	Use of wastes obtained from any of the operations numbered R1 to R10
Recycling and composting	R12	Exchange of wastes for submission to any of the operations numbered R1 to R11
Other recovery	R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)

Source: "EU Waste Framework Directive 2008/98", November 2018, European Union

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Table 5 – Disposal operations as defined in the EU Waste Framework Directive 2008/98

Treatment	R&D code	Description
Landfill	D1	Deposit into or onto land, e.g. landfill
Other disposal	D2	Land treatment, e.g. biodegradation of liquid or sludgy discards in soils
Other disposal	D3	Deep injection, e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories
Other disposal	D4	Surface impoundment, e.g. placement of liquid or sludgy discards into pits, ponds or lagoons
Landfill	D5	Specially engineered landfill, e.g. placement into lined discrete cells which are capped and isolated from one another and the environment
Other disposal	D6	Release into a water body, except seas/oceans
NA	D7	Release into seas/oceans, including sea-bed insertion
Other disposal	D8	Biological treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12
Other disposal	D9	Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12, e.g. evaporation, drying, calcination
Incineration	D10	Incineration on land
NA	D11	Incineration at sea
Other disposal	D12	Permanent storage, e.g. emplacement of containers in a mine
Other disposal	D13	Blending or mixing prior to submission to any of the operations numbered D1 to D12
Other disposal	D14	Repackaging prior to submission to any of the operations numbered D1 to D13
Other disposal	D15	Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced)

Source: "EU Waste Framework Directive 2008/98", November 2018, European Union

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A.4 Residual waste treatment capacity

Table 6 – Operational Energy from Waste plants in England

Plant name	Region	Feedstock capacity [kt]	CCS potential identified
Advanced Plasma Power Pilot Plant	South West	12.5	No
Allerton Waste Recovery Facility	Yorkshire and Humber	320	No
Allington EfW Plant	South East	500	No
Ardley Energy Recovery Facility	South East	326.3	No
Avonmouth Resource Recovery Centre	South West	320	No
Battlefield ERF	West Midlands	90	No
Beddington Energy Recovery Facility	London	300	No
Bolton WtE plant	North West	85	No
Cornwall Energy Recovery Centre	South West	240	No
Cory Riverside Energy	London	750	No
Coventry EfW Plant	West Midlands	315	No
Devonport EfW CHP Facility	South West	245	No
Dudley EfW plant	West Midlands	105	No
Eastcroft EfW plant	East Midlands	180	No
EnviRecover	West Midlands	200	No
Exeter Energy Recovery Facility	South West	60	No
Ferrybridge Multifuel 1 (FM1)	Yorkshire and Humber	570	Yes
Ferrybridge Multifuel 2 (FM2)	Yorkshire and Humber	570	Yes
Gloucestershire (EfW) plant (Javelin)	South West	190	No
Great Blakenham EfW plant	Eastern	269	No
Greatmoor	South East	345	No
Integra North (Chineham)	South East	102	No
Integra South West (Marchwood)	South East	180	No
Kirklees EfW plant	Yorkshire and Humber	150	No
Lakeside Energy from Waste facility	South East	450	No
Leeds Recycling & ERF	Yorkshire and Humber	179.6	No
Lincolnshire EfW Plant	East Midlands	190	No
LondonWaste ERF (Edmonton)	London	675	No
Milton Keynes Waste Recovery Park	South East	132	No
Newhaven Energy Recovery Facility	South East	210	No
Newlincs EfW plant	Yorkshire and Humber	56	Yes
Peterborough Energy Recovery Facility	Eastern	85	No
Portsmouth Energy Recovery Facility	South East	180	No
Runcorn EfW plant	North West	1100	Yes
SELCHP Energy Recovery Facility	London	464	No
Sevenside Energy Recovery Centre	South West	400	No
Sheffield Energy Recovery Facility	Yorkshire and Humber	225	No
Stoke EfW Plant	West Midlands	210	No
Tees Valley EfW Facility (Billingham)	North East	756	No
Tyseley Energy Recovery Facility	West Midlands	350	No
W2R Staffordshire ERF	West Midlands	340	No
Wheelabrator Kemsley (K3)	South East	550	No
Wilton 11 EfW Plant	North East	500	Yes
Wolverhampton EfW Plant	West Midlands	115	No

Source: ENDS Waste & Bioenergy, EWB Plant Tracker. CCS potential based on AFRY assessment of proximity to likely CCUS cluster.

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Table 7 – Energy from Waste plants under construction in England

Plant name	Region	Feedstock capacity [kt]	CCS potential identified
Baddesley EfW plant	West Midlands	130	No
Bridgwater Resource Recovery	South West	100	No
Drakelow Renewable Energy Centre	East Midlands	169	No
Energy Works Hull	Yorkshire and Humber	227	Yes
Hooton Bio Power	North West	240	Yes
Isle of Wight	South East	30	No
Lostock Sustainable Energy Plant	North West	600	No
Newhurst Quarry EfW plant	East Midlands	375	No
Protos EfW plant	North West	350	Yes
Rookery Pit Energy Recovery Facility	Eastern	585	No
Slough Multifuel	South East	480	No
Surrey ECO park	South East	60	No

Source: ENDS Waste & Bioenergy, EWB Plant Tracker

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Table 8 – Consented Energy from Waste plants in England

Plant name	Region	Feedstock capacity [kt]	CCS potential identified
3Rs EfW Plant (Britannia Crest)	South East	230	No
Billingham EfW Haverton Hill extension (Suez)	North East	200	Yes
Bloomfield Recycling Depot (Resubmission)	West Midlands	180	No
Corby Energy Recovery Centre (Shelton Road EfW)	East Midlands	260	No
Cory Riverside Energy Park (REP)	London	665	No
Darwen EfW Plant	North West	500	No
Derwenthaugh Ecoparc (resubmission)	North East	320	No
Eastcroft EfW (3rd Line) (resubmission)	East Midlands	30	No
Edmonton EcoPark	London	700	No
Fort Parkway Energy (Castle Bromwich)	West Midlands	150	No
Graythorpe Energy Centre (Hartlepool)	North East	500	Yes
Greengate EfW Plant	North West	130	Yes
Hams Hall Energy Centre	West Midlands	145	No
Hay Hall Bio Power	West Midlands	277	No
Heysham EfW Plant (Lancaster West Business Park)	North West	330	No
Keighley EfW Plant (Aire Valley Road)	Yorkshire and Humber	130	No
Keypoint Swindon Energy Centre	South West	150	No
Kingmoor Park	North West	250	No
Knottingley EfW Plant (Southmoor)	Yorkshire and Humber	350	No
Land to the South of Knapton Quarry Landfill Site	Yorkshire and Humber	65	No
North Beck Energy EfW plant	Yorkshire and Humber	500	Yes
Purbrook Road	West Midlands	12	No
Redcar Energy Centre	North East	450	Yes
Red Scar Industrial Estate - EfW (Preston EfW)	North West	395	No
Skelton Grange EfW Plant	Yorkshire and Humber	410	No
Solar 21 EfW plant (Melton EfW)	Yorkshire and Humber	250	Yes
South Humber Bank Energy Centre	Yorkshire and Humber	499	Yes
Tilbury Docks - Phase 2 (EfW)	Eastern	300	No
Walsall EfW Plant	West Midlands	478	No
Waste-to-Jet Fuel Facility	Yorkshire and Humber	500	Yes
Wheelabrator West Bromwich	West Midlands	400	No
Wren Power and Pulp (Rivenhall Airfield)	Eastern	595	No

Source: ENDS Waste & Bioenergy, EWB Plant Tracker & Renewable Energy Planning Database, Department for Business, Energy, & Industrial Strategy. As of 1 July 2021

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Table 9 – Planning applications submitted, Energy from Waste plants in England

Plant name	Region	Feedstock capacity [kt]	CCS potential identified
Boston Alternative Energy Facility	East Midlands	1000	No
Doncaster EfW Plant	Yorkshire and Humber	384	No
EP South Humber Bank Energy Centre	Yorkshire and Humber	255	Yes
Exeter EfW plant	South West	125	No
Stoke Replacement EfW Plant	West Midlands	210	No
Teesport EfW 1	North East	300	Yes
Teesport EfW 2	North East	0	Yes
Tipton Multifuel Plant	West Midlands	180	No
New Circular Technology Park (Ford)	South East	295	No
Northacre RRC	South West	243	No
Alpha Grimsby Renewable Centre	Yorkshire and Humber	169	Yes

Source: ENDS Waste & Bioenergy, EWB Plant Tracker. As of 1 July 2021

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