

# UK Energy from Waste Statistics – 2022



May 2023



## INTRODUCTION

As in previous years, Tolvik's 2022 report on the UK Energy from Waste ("EfW") sector brings together data, sourced primarily from the Annual Performance Reports ("APR") submitted by operators to their respective regulator, into a single, readily accessible document.

The focus of this report remains upon facilities in the UK designed for the combustion of Residual Waste. Residual Waste is defined as non-hazardous, solid, combustible mixed waste which remains after recycling activities. This definition is a little broader than that for Municipal Waste but primarily includes wastes falling within European Waste Catalogue ("EWC") 19 12 10, 19 12 12 and 20 03 01. The report continues to exclude EfW facilities in Jersey and the Isle of Man.

As last year, the report also provides a high level summary of the tonnage of Residual Waste, generally in the form of Solid Recovered Fuel ("SRF"), sent to co-incineration facilities in the UK.

In recent years the number of operational EfWs in the UK has risen, and at the same time APR reporting requirements have, understandably, become more detailed. The consequence is that the volume of data has increased significantly. We have therefore decided that whilst the published report will continue to be available free of charge via <u>www.tolvik.com</u>, its focus will be upon the performance of the EfW "fleet" as a whole rather than analysing the range of performances of individual EfWs or operators.

If asset / operator specific or longer term trend data is required then Tolvik would be willing to provide bespoke analysis for a modest fee commensurate with the time spent. If this is of interest please contact us at <u>info@tolvik.com</u> and we can provide a fee proposal.

We continue to be very grateful to the co-operation from all concerned in releasing information on a timely basis and their assistance in filling any gaps in the information which arise. We also thank those who have provided feedback on prior issues of the report.

Please note, where applicable, prior year data has been updated to reflect the latest available information and that data tables may not add up to the total due to rounding. Third parties are entitled to freely use the contents of the report, subject to appropriately acknowledging its source.

Front Cover Image: Baldovie EfW CHP Facility Courtesy: MVV

## 1. KEY METRICS FOR 2022



Figure 1: Comparison of 2022 vs 2021

2022 saw the lowest year on year increase in EfW inputs since Tolvik's annual EfW statistics report was first published in 2014. This was in large part a function of the commissioning profile of new EfWs, although 2022 also saw the lowest average EfW availability since 2015. It is noted that a significant number of APRs made reference to the adverse impact of gas canisters in Residual Waste on EfW reliability.

Turbine reliability continues to improve, helping to contribute to a significant increase in power exports.

Analysis of expanded data on Net Calorific Value ("NCV") would appear to further support the analysis in last year's report that the average NCV of unprocessed Residual Waste is around 5% higher than in 2017.



## 2. CAPACITY AND WASTE INPUTS

The EfWs falling within the scope of this report are listed in Appendix 1.

As at December 2022 there were 57 fully operational EfWs in the UK (i.e. those which prepared an APR for 2022) with a further three EfWs which accepted waste during the year as part of commissioning. 14 EfWs were under construction at the end of the year. Three facilities (Sinfin Road ACT, Hoddesdon ACT and Newport), have been categorised as "mothballed / decommissioned" and excluded from further analysis.

The Total Permit Capacity of those EfWs which were fully operational at the end of 2022 was 17.52Mtpa. With an additional 0.74Mtpa of capacity at EfWs which also accepted Residual Waste and 4.98Mtpa at EfWs in construction the "certain" Total Permit Capacity as at the end of 2022 was 23.24Mtpa – an increase of 7.2% over the previous year.

According to data provided, in 2022 a total of 15.32Mt of waste was combusted in UK EfWs, an increase of 2.6% when compared with the revised 2021 total. This is the smallest annual percentage increase in inputs since 2008. For EfWs fully operational throughout 2022, inputs were the equivalent to 88.0% of the Permit Capacity (2021: 89.0%).



Figure 2: Total Permit Capacity and EfW Inputs in 2014-2022 Source: APR

Mtpa	Permit	Capacity	Total Inputs		
	Fully Operational	Total (incl. in construction)	Tonnage	Annual Increase	
2018	12.48	16.88	11.49	5.6%	
2019	14.65	18.41	12.63	9.9%	
2020	16.27	20.37	14.07	11.4%	
2021 (r)	16.37	21.67	14.94	6.2%	
2022	17.52	23.24	15.32	2.6%	

Figure 3: Total Permit Capacity (as at December 2022) and EfW Inputs Source: Tolvik analysis

As at December 2022 the capacity-weighted average age of the 60 UK EfWs which accepted waste in 2022 was 11.1 years (2021: 10.7 years).



## EfW Inputs by Waste Source and Code

Based on a detailed review of APRs for 2022 and Wastedataflow<sup>(1)</sup> for 2021/22, it is estimated that in 2022 76.3% (*2021: 77.0%*) of all EfW inputs were derived from Residual Local Authority Collected Waste ("LACW") with the remainder being Commercial and Industrial Waste ("C&I").

In 2022, 38kt (2021: 38kt) of Clinical Waste was reported by operators as being processed by EfWs.

#### **Net Calorific Value of Residual Waste**

In 2022, for the first time the majority of facilities (36) provided NCV data within their APR. In a few cases the data was clearly incorrect (being an order of magnitude wrong) and so has been excluded from analysis.

Considering only those EfWs primarily accepting untreated waste under 20 03 xx codes, the weighted average NCV for all inputs was 9.78MJ/kg (2021: 9.62MJ/kg). These facilities in total accepting 79.4% LACW and 20.6% C&I Waste.

A detailed analysis by Tolvik of data relating to the NCV of Residual Waste (from a variety of sources, some of which were under confidentiality) suggested that the average NCV for Residual LACW in 2017 was 8.87MJ/kg and for Residual C&I Waste it was 11.01MJ/kg.

The 2021 report estimated that, on a like-for-like basis, **average NCVs were 4.3% higher in 2021 than 2017**, but as this was the first such year in which there was a variance to 2017 data it was not statistically significant. In 2022, using the 2017 data as the basis for calculation the expected weighted average NCV of Residual Waste inputs would have been 9.31MJ/kg. On a like-for-like basis, this infers that **average NCVs were 5.0% higher in 2022 than 2017** – i.e. broadly in line with last year's analysis, so suggesting a modest increase of around 5% in average NCVs over the last 5 years.

#### 3. ENERGY

It is estimated that the total power exported by EfWs in the UK in 2022 was 9,428GWh – approximately 3.2% of total net UK power generation of 293,746GWh<sup>(2)</sup>.

	Est. Gross Power Generation GWh <sub>e</sub>	Power Export GWh <sub>e</sub>	Parasitic Load (excl. power import)	Parasitic Load (incl. power import)	Average Export kWh/tonne input	Net Heat Export GWh <sub>th</sub>
2018	7,150	6,230	12.9%	13.9%	542	1,112
2019	7,769	6,703	13.7%	16.2%	531	1,384
2020	9,002	7,769	13.7%	15.5%	553	1,651
2021	10,060	8,643	14.1%	16.2%	591	1,845
2022	10,861	9,428	13.2%	14.3%	620	1,770

Figure 4: 2022 Power Generation Source: Tolvik analysis

The average power exported per tonne of waste inputs was 620kWh – the highest reported figure. This was in part due to improved turbine availability during the year (see page 4), but it is also likely to have been influenced by the modest rise in Residual Waste NCV as discussed in Section 2.





## **Beneficial Heat Use**

In 2022, 1,770GWh<sub>th</sub> (2021: 1,845GWh<sub>th</sub>) of heat was exported for beneficial use alongside power. Across all EfWs this was the equivalent of 115kWh<sub>th</sub>/tonne of inputs (2021: 123kWh<sub>th</sub>/tonne).

EÐM	Est. Export GWh <sub>th</sub>								
EIVV	2018	2019	2020	2021	2022				
Runcorn	408	405	480	616	502				
Eastcroft	332	420	405	390	361				
Wilton 11	100	303	373	332	289				
Kemsley	-	-	123	235	344				
Sheffield	112	111	95	98	91				
Devonport	59	48	54	54	52				
Gremista	40	40	50	42	49				
SELCHP	38	39	40	44	39				
Leeds	8	2	14	16	25				
Coventry	11	13	8	12	13				
NewLincs	3	3	7	3	4				
Other	-	-	2	2	-				
Total	1,112	1,384	1,651	1,845	1,770				



Figure 7: Reported Heat Exports from EfWs Source: APR



# 4. **OPERATIONS**

For those EfWs which were operational for the whole of 2022, the weighted average availability based on waste combustion hours was 87.7% (2021: 88.6%). The simple average turbine availability was identical at 87.7% (2021: 84.0%) – the first time turbine availability has been at least as great as waste combustion availability. This enhanced turbine availability helped contribute to the higher average net power export.

For the six reporting ACT facilities, the average availability during 2022 was 58.3% (2021: 48.5%) with a high of 81.6%. Excluding these ACT facilities, the weighted average availability for waste combustion at "conventional" EfWs during the year was 89.4% (2021: 90.6%).







	Availabilit	y - Hours	% of Input Tonnage				
	Waste Combustion – Weighted Average	Turbine Operations – Simple Average	Incinerator Bottom Ash ("IBA")	Air Pollution Control Residue ("APCr")	Metals Recovery (if reported)		
2018	89.8%		19.9%	3.3%	1.9%		
2019	90.0%	81.9%	19.4%	3.3%	1.9%		
2020	89.8%	85.9%	19.8%	3.1%	1.9%		
2021	88.6%	84.0%	19.8%	3.2%	1.7%		
2022	87.7%	87.7%	19.3%	3.0%	1.6%		

Figure 10 also shows ash generation and metals recovery per tonne of waste input declining modestly.

#### **Consumable Use**

The analysis in this section is calibrated to "Specific Usage" i.e. usage per tonne of waste input.



Figure 11: Trends in Consumable Usage (where reported) Source: APR



Note the trend in reduction in the last few years in fuel oil usage and ammonia usage; both perhaps reflecting the significant increase in the cost of these commodities.

#### **R1 Energy Efficiency Status**

As at April 2023, based on EA data and information in the APR, 35 fully operational EfWs with a total headline capacity of c. 13.5Mtpa were accredited as R1 ("recovery") operations.

Those EfWs in 2022 which did not have R1 status were classified as "disposal" operations.

#### Carbon Intensity of EfW (per tonne)

In 2022 the standard APR format in England was expanded to include data reporting with respect to carbon emissions. Of the 47 fully operational EfWs in England, 41 provided returns on carbon emissions.

The key new elements of data relate to total  $CO_2$  emissions per tonne,  $N_2O$  emissions per tonne and biogenic/qualifying  $CO_2$  emissions.

As Figure 12 shows, the weighted average reported  $CO_2$  emissions per tonne has fallen over the last 5 years. In some cases this is because previous Pollution Inventory ("PI") returns from EfW operators had been estimates. Whilst the quality of data continues to improve, 2022 returns included one EfW reporting total emissions of 0.30tCO<sub>2</sub> per tonne of Residual Waste input and another 1.44tCO<sub>2</sub> per tonne.



Figure 12: Trends in CO<sub>2</sub> emissions per tonne

In 2022 the average estimated biogenic content of  $CO_2$  emitted from UK EfWs was 52.5% with a range across all facilities of 26.4% to 70.8%. The corresponding 47.5% fossil content was broadly similar to the estimates Tolvik used in past editions of this report.

In 2022 the average reported  $N_2O$  emissions per tonne were significantly lower than the average reported in previous years in the PI. This could be due to a greater number of facilities reporting in the APR (the number of returns in the PI was relatively low – and potentially those with higher emissions tended to report). However the reported data varies so further validation of data from future returns may be beneficial.

Excluding any benefits from avoiding landfill, it is estimated that in 2022, on average across the UK fleet, net carbon emissions were 0.308tCO<sub>2</sub>e per tonne of waste.

The figures for 2021 have been updated with the latest available PI data and overall in 2022 across the UK EfW fleet net carbon emissions per tonne were down 5.2% on the revised estimated emissions of 0.324tCO<sub>2</sub>e per tonne of waste for 2021.



	Per tonne of Input Waste	Unit	Data Source	2020	2021 (revised)	2022
	Average CO <sub>2</sub> emitted	tCO <sub>2</sub>	2020/21 PI <sup>(3)</sup> 2022 APR	0.992	0.965	0.942
	% Fossil		2020/21 Estimate, 2022 APR	47.9%	47.9%	47.5%
	Fossil CO <sub>2</sub> emitted	tCO <sub>2</sub>		0.475	0.463	0.448
sions	N <sub>2</sub> O emitted	tCO <sub>2</sub> e	2020/21 PI <sup>(3)</sup> . 2022 APR	0.037	0.028	0.014
mis	Fuel import	tCO <sub>2</sub> e	APR and UK GHG Conversion Factor	0.007	0.006	0.006
	Total Fossil Emissions	tCO <sub>2</sub> e		0.519	0.497	0.468
	Total Power Export	MWh	Figure 4	0.553	0.591	0.620
puts	Imported Power	MWh	APR	(0.007)	(0.006)	(0.005)
, Out	Net Power Export	MWh		0.546	0.584	0.615
EfW	Heat Export	MWh	Figure 7 text	0.117	0.124	0.115
	Recycling Benefit	t	Figure 10	0.019	0.017	0.016
c	Net Power Export	tCO <sub>2</sub> e	Converted using UK Government	(0.127)	(0.124)	(0.119)
itutio	Heat Export	tCO <sub>2</sub> e	GHG Conversion Factors for company reporting for the applicable	(0.020)	(0.026)	(0.020)
ubsti Ben	Recycling Benefit	tCO <sub>2</sub> e	year <sup>(4)</sup>	(0.039)	(0.022)	(0.021)
S	Total Benefits	tCO <sub>2</sub> e		(0.186)	(0.173)	(0.160)

	Impact (Net Emissions)	tCO <sub>2</sub> e		0.333	0.324	0.308
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Figure 13: Estimated Carbon Emissions per tonne of waste input

#### 5. COMPLIANCE

Compliance in the EfW sector is a combination of operator self-monitoring, reporting to and monitoring by the relevant regulator. Operators advise that measurement uncertainty, limits of detection for small samples and impact of background pollutant levels can all affect the analysis, but the protocols used by the sector should be such that reported results are effectively a worst case.

Across all continuously monitored emissions to air, on average in 2022 emissions were modestly higher at 29.3% of the Emission Limit Value ("ELV") (2021: 28.4%). Meanwhile, for periodically sampled emissions, on average emissions were 9.4% of ELV (2021: 8.6%).



Figure 14: Continuously Monitored to Air Source: APR



Figure 15: Periodically Sampled to Air Source: APR



# **Abnormal Operations**

Abnormal Operations	Unit	Year	Total	Number of EfWs Reporting	Per EfW
		2020	168	48	3.5
Abnormal Hours	Hours	2021	120	52	2.3
		2022	168	48	3.5
		2020	72	48	1.5
Abnormal Events	Instances	2021	101	51	2.0
		2022	95	54	1.8
		2020	148	47	3.1
Permit Breaches	Instances	2021	139	50	2.8
		2022	222	55	4.0

Figure 16: Abnormal Operations Source: APR

In 2022 nine different EfWs reported more than 10 permit breaches and together accounted for 66% of all breaches. Three EfWs, whose operator went into administration during the year, accounted for 27% of all permit breaches.

# 6. CAPACITY DEVELOPMENT



Figure 17: Projected EfW Operational Capacity and Residual Waste Source: APR

Based on EfWs which were operational and in construction as at December 2022, Section 2 identifies the Total Permit Capacity of 23.24Mtpa. Permit Capacity is not suitable for projecting future EfW capacity – as EfWs generally do not operate at this level.

"Operational Capacity" is a more appropriate measure. It is estimated that, based on the level of inputs in 2022 of 88% as discussed in Section 2, by 2027 the UK Operational Capacity will be **20.7Mtpa**.

Figure 17 also shows historic Residual Waste tonnages in the UK.



# **APPENDIX 1: ENERGY FROM WASTE FACILITIES INCLUDED IN THE REPORT**



Key: Location of EfW facilities (ID Numbers refer to page 10, Blue = Operational, Green = In Construction / Commissioning)



Permit

Processed (ktpa)

# **Operational EfWs** (i.e. those providing an APR for 2022)

(P) denotes Public Sector							
	Permitted Name						
4		6					

Permitted Name         (App a)         2022         (App a)         2022         2022           1 Rurcon: EW Facility         Rurcon Hubiton         Vitability         100         997         920           2 Revested Resource Recovery Facility         Previside Beduy         Stockon-an-Tess         sac.         756         075         075           4 Forrybridge Multival 1         Perrybridge PM2         Wakefield         orfinkm         722         060         033           51 Kennaley Park EW         Edmonton         Effedid         andoremy (P)         042         546           51 Kennaley Park EW         Edmonton         Effedid         andoremy (P)         042         542         642           51 Kennaley Park EW         Edmonton         Effedid         andoremy (P)         047         477         642         648         048         042         425         178         646         462         438         326         245         245         245         245         245         245         245         245         245         178         178         178         176         176         126         246         435         356         361         245         356         361         245         376	(P) C	enotes Public Sector				Capacity	Processe	ed (ktpa)
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Indext         Cardinit         Unitability         Cardinity         Unitability         Cardinity         Cardinity <thcardinity< th=""> <thcardinity< th=""> <thc< td=""><td>10</td><td></td><td>Tyseley</td><td>Diriningriam</td><td>Veolia</td><td>441</td><td>373</td><td>370</td></thc<></thcardinity<></thcardinity<>	10		Tyseley	Diriningriam	Veolia	441	373	370
01         Description         District         Princip         Pactor         Pac	10			Cardill		420	376	360
45         Beddington Energy Recovery Facility         Eledangton Lane         Ciryaton         Vindor         34/         320         334           13         Greatmoor EW         Greatmoor EW         Staffordshire         Vindor         326         333         340           14         Staffordshire EKF         Four Ashes         Staffordshire         Vindor         326         334         309           13         Dunbar         East Lothian         Vindor         325         307         314           14         Iallerton Waste Recovery Park         Allerton Park         North Yorkshire         Thalla         320         287         284           16         CSWDOC Waste to Energy Plant         Coventry         Cowntry         CSWDOC (P)         315         255         292         283           18         Devoport EW CHP Facility         Great Blakenham         Suffolk         Suez         295         292         228         224         240         242         229         228         224         128         228         224         240         242         229         229         229         229         229         229         229         229         229         220         200         206	54		Avonmouth	Bristol	Viridor	3/7	285	364
13         Greatmoor         Biokinghamshire         PCC         345         303         297           14         Staffordshire         Nvola         339         340         339         340           15         Ardley ENV Facility         Ardley         Oxfordshire         Viridor         326         334         309           14         Allerton Waste Recovery Park         Allerton Park         North Yorkshire         Thalla         320         287         224           16         CSWDC Waste to Energy Plant         Coventry         Coventry         CSWDC (P)         315         295         292         283           18         Bevonport EW CHP Facility         Great Blakenham         Staffield         Neolia         245         228         224           18         Bevonport EW CHP Facility         Devonport         Pymouth         MV         228         224         224         220         221         226         Envikecover EW Facility         Harlfengrey Recover Centre         Cornwall         Suez         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240<	45	Beddington Energy Recovery Facility	Beddington Lane	Croydon	Viridor	347	320	334
I+         Event Ashes         Staffordshire         Veola         340         339         340           15         Ardieg FWD Facility         Ardiely         Oxfordshire         Viridor         326         334         309           43         Dunbar Energy Recovery Parility         Dunbar         East Lothian         Viridor         326         334         309           41         Allerton Waste to Energy Plant         Coventry         Coventry         Coventry         Coventry         Coventry         Coventry         Staffold         Suzz         295         292         233           16         Devonport EW CMP Facility         Devonport         Plymouth         MVV         265         243         260           21         Iseptified ERF         Sheffield         Sheffield         Sheffield         Sheffield         Sheffield         242         229         229         229         229         229         229         229         229         220         220         200         205         Enriffecover EW Facility         Hardrowood         Soutrampton         Veola         220         200         206         243         244         240         242         240         242         240         242         240<	13	Greatmoor ETW	Greatmoor	Buckinghamshire	FCC	345	303	297
15 Ardley LW Facility         Ardley         Oxfordshire         Viridor         326         334         309           43 Dunbar energy Recovery Facility         Dunbar         East Lothian         Viridor         325         307         314           14 Allerton Waste Recovery Park         Allerton Park         North Yorkshire         Thalia         320         287         284           16 CSWDC Waste to Energy Works         Energy Works ACT         Hull Big G         315         35         52           18 Devonport EW CHP Facility         Great Blakenham         Suffield         Suez         295         292         233           18 Devonport EW CHP Facility         Devonport         Phymouth         MVV         265         243         260           20 Sheffield ERF         Sheffield         Sheffield         Veolia         242         228         224           19 Conrwall Energy Recovery Centric         Cornwall         Cornwall         Suez         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240         242         240	14	Statfordshire ERF	Four Ashes	Staffordshire	Veolia	340	339	340
13         Dunbar         East Lothian         Viridor         325         307         314           14         Nerth Vorkshire         Thalai         320         227         224           16         CSWDC Waste to Energy Plant         Coventry         COventry         CSWDC (P)         315         295         298           16         ILEC SWDC Waste to Energy Plant         Coventry         CSWDC (P)         315         35         52           17         SUEZ Suffok - EW Facility         Great Blakenham         Suffolk         Suez         295         292         283           18         Devonport EW CHP Facility         Devonport         Plymouth         MVV         265         243         260           20         Sheffield         Sheffield         Veolia         242         228         224         240           25         EnviRecover Centre         Cornwall         Suez         280         216         2113         2216         213         220         200         206         243         126         2411         240         240         240         240         242         240         242         240         240         242         240         200         120 <td< td=""><td>15</td><td>Ardley EfW Facility</td><td>Ardley</td><td>Oxfordshire</td><td>Viridor</td><td>326</td><td>334</td><td>309</td></td<>	15	Ardley EfW Facility	Ardley	Oxfordshire	Viridor	326	334	309
141       Allerton Park       North Yorkshire       Thalia       320       287       284         16       CSWDC Waste to Energy Plant       Coventry       Coventry       CSWDC (P)       315       295       298         16       CSWDC Works       Energy Works ACT       Hull Energy Works       Suer Coventry       CSWDC (P)       315       235       52         17       SUEZ Suffok - ErW Facility       Great Blakenham       Suffok       Suez       295       292       283         18       Devonport EfW CHP Facility       Devonport       Phymouth       MVV       266       243       260         20       Sheffield ERF       Sheffield       Sheffield       Veolia       242       228       228         18       Devonport EfW Facility       Hartebury       Worcestershire       Severn       230       216       213         21       Integra South East ERF       Portsmouth       Portsmouth       Poelia       220       200       206         23       Integra South East ERF       Portsmouth       Portsmouth       Poelia       220       106       112         24       Stoke EfW Facility       Hanford       Stoke-on-Trent       MESE/Cobalt       210       166	43	Dunbar Energy Recovery Facility	Dunbar	East Lothian	Viridor	325	307	314
16       CSWDC Waste to Energy Plant       Coventry       CSWDC (P)       315       295       298         8       Hull Energy Works       Energy Works ACT       Hull       BIG       315       35       52         17       SUEZ Suffolk - EfW Facility       Great Blakenham       Suffolk       Suez       295       292       283         18       Devonport EfW ChP Facility       Devonport       Phymouth       MVV       265       243       226         20       Sheffield EFF       Sheffield       Sheffield       Veolia       242       229       229         21       Newhaven ERF       Newhaven       East Sussex       Veolia       242       242       240         25       EnviRecover EfW Facility       Hartlebury       Woresetershire       Severn       230       216       213         25       EnviRecover EW Facility       Hardrowood       Southampton       Veolia       220       200       200         24       Stoke EfW Facility       Hardrowood       Southampton       Veolia       210       186       182         26       Extorefree FF       Parc Adfer       Deteside       enfnium       200       192       198         21	41	Allerton Waste Recovery Park	Allerton Park	North Yorkshire	Thalia	320	287	284
58         Hull         BIG         315         35         52           17         SUEZ Suffolk - EfW Facility         Great Blakenham         Suffolk         Suez         295         292         283           18         Devonport EW CHP Facility         Devonport         Phymouth         MVV         265         243         260           20         Sheffield ERF         Sheffield         Sheffield         Veolia         242         229         229           21         Newhaven ERF         Newhaven         East Sussex         Veolia         242         240         242         240           25         EnviRecover EW Facility         Harlebury         Worcestershire         Severn         230         216         213           21         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke EW Facility         Eastcroft         Nottingham         FCC         200         186         182           28         Lincolnshire         ERC         190         191         192         198           28         Lincolnshire IW Facility         North Hykeham         Lincolnshire         FCC         190	16	CSWDC Waste to Energy Plant	Coventry	Coventry	CSWDC (P)	315	295	298
17       SUEZ Suffok. ERW Facility       Great Blakenham       Suffolk       Suez       295       292       283         18       Devonport EW CHP Facility       Devonport       Plymouth       MVV       265       243       260         20       Sheffield       Sheffield       Sheffield       Qeolia       245       228       224         21       Newhaven ERF       Newhaven       East Sussex       Veolia       242       229       229         19       Cornwall       EnviRecover EW Facility       Hartlebury       Worestershire       Severn       230       216       213         22       Integra South West ERF       Marchwood       Southampton       Veolia       220       200       206         23       Integra South East ERF       Portsmouth       Portsmouth       Veolia       220       200       206         24       Stoke ENV Facility       Eastcroft       Nottingham       FCC       200       186       182         28       LincoInshire EWF Facility       North Hykeham       LincoInshire       FCC       190       171       172         24       Millerhill       Edinburgh       FCC       190       161       157 <t< td=""><td>58</td><td>Hull Energy Works</td><td>Energy Works ACT</td><td>Hull</td><td>BIG</td><td>315</td><td>35</td><td>52</td></t<>	58	Hull Energy Works	Energy Works ACT	Hull	BIG	315	35	52
18         Devonport         EWN         MVV         265         243         260           20         Sheffield ERF         Sheffield         Sheffield         Veolia         245         228         224           21         Newhaven ERF         Newhaven         East Sussex         Veolia         242         229         229           19         Cornwall         Suez         240         242         229         229           21         Newhaven         East Sussex         Veolia         220         220         220         220         210         200         201         200         201         200         206         24         Stoke ENF         Marchwood         Southampton         Veolia         220         200         206         248         Stoke ENF         Faulty         Hanford         Stoke-on-Trent         MESE/Cobalt         210         185         182           28         Lincolnshire         EW Facility         North Hykeham         Lincolnshire         FCC         190         171         172           29         Javelin Park         Glaucestershire         Urbaser         190         191         189           20         Javelin Park ERF         Javelin Park	17	SUEZ Suffolk - EfW Facility	Great Blakenham	Suffolk	Suez	295	292	283
20         Sheffield         Sheffield         Veolia         245         228         224           21         Newhaven ERF         Newhaven         East Sussex         Veolia         242         229         229           21         Gormwall         Corrwall         Suzz         240         242         229         229           25         EnviRecover EfW Facility         Hartlebury         Worcestershire         Severn         230         216         213           21         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke EfW Facility         Hanford         Stoke-on-Trent         MESE/Cobalt         210         185         194           26         Eastoroft EfW Facility         Eastoroft TW Nottingham         FCC         200         196         182           28         Lincoinshire EfW Facility         North Hykeham         Lincoinshire FCC         190         161         157           29         Leeds         Leeds         Veolia         190         181         183           21         Leeds Ascycling and ERF         Javelin Park         Gloucestershire         Urbaser         190         181 </td <td>18</td> <td>Devonport EfW CHP Facility</td> <td>Devonport</td> <td>Plymouth</td> <td>MVV</td> <td>265</td> <td>243</td> <td>260</td>	18	Devonport EfW CHP Facility	Devonport	Plymouth	MVV	265	243	260
21         Newhaven ERF         Newhaven         East Sussex         Veolia         242         229         229           19         Corrnwall Energy Recovery Centre         Corrnwall         Corrnwall         Suez         240         242         240           25         EnviRecover EW Facility         Hartlebury         Worcestershire         Severn         230         216         213           21         Integra South West ERF         Marchwood         Southampton         Veolia         220         200         206           23         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke ErW Facility         Eastcroft         Nottingham         FCC         200         186         182           26         Eastcroft         Nottingham         FICC         190         1171         172           46         Millerhill         Edinburgh         FCC         190         1161         157           49         Javelin Park         Gloucestershire         Urbaser         190         181         187           31         Baldovie Waste To Energy Plant         Baldovie         Dundee         MVV         175	20	Sheffield ERF	Sheffield	Sheffield	Veolia	245	228	224
19         Cornwall         Suez         240         242         240           25         EnviRecover EW Facility         Hartlebury         Worcestershire         Severn         230         216         213           22         Integra South ERF         Marchwood         Southampton         Veolia         220         210         200           23         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke EW Facility         Eastcroft         Nottingham         FCC         200         186         182           26         Eastcroft ERF         Parc Adfer         Deeside         enfinium         200         192         198           28         Lincolnshire EW Facility         North Hykeham         Lincolnshire         FCC         190         1171         172           246         Millerhill         Edinvergin         FCC         190         181         187           21         Leeds         Leeds         Veolia         190         181         187           24         Glasgow REC         Glasgow ACT         Glasgow         Viridor         154         99         132	21	Newhaven ERF	Newhaven	East Sussex	Veolia	242	229	229
25         EnviRecover EW Facility         Hartlebury         Worcestershire         Severn         230         216         213           22         Integra South West ERF         Marchwood         Southampton         Veolia         220         210         200           23         Integra South West ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke ETW Facility         Harford         Stoke-on-Trent         MESE/Cobait         210         185         194           26         Eastcroft ERF         Parc Adfer         Deeside         enfinium         200         192         198           28         Lincolnshire ERF         Parc Adfer         Deeside         enfinium         200         192         198           27         Leeds Recycling and ERC         MillerHill         Edinburgh         FCC         190         161         157           49         Javelin Park         Gloucestershire         Urbaser         190         181         189           21         Leeds         Leeds         Veolia         190         181         182           43         Glasgow REC         Glasgow ACT         Glasgow         Viridor	19	Cornwall Energy Recovery Centre	Cornwall	Cornwall	Suez	240	242	240
22         Integra South West ERF         Marchwood         Southampton         Veolia         220         210         200           23         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke EfW Facility         Hanford         Stoke-on-Trent         MESE/Cobalt         210         185         194           26         Eastcroft EWV Facility         Eastcroft         Nottingham         FCC         200         186         182           28         Lincolnshire EWF Facility         North Hykeham         Lincolnshire FCC         190         171         172           46         Millerhill         Edinburgh         FCC         190         161         157           41         Javelin Park ERF         Javelin Park Gloucestershire         Urbaser         190         181         187           31         Baldovie Waste To Energy Plant         Baldovie         Dundee         MVV         175         161         182           47         Glasgow RREC         Glasgow ACT         Glasgow         Yiridor         154         99         132           52         Full Circle Generation EfW         Belfast ACT         Belfast	25	EnviRecover EfW Facility	Hartlebury	Worcestershire	Severn	230	216	213
23         Integra South East ERF         Portsmouth         Portsmouth         Veolia         220         200         206           24         Stoke ENV Facility         Hanford         Stoke-on-Trent         MESE/Cobalt         210         185         194           26         Eastcroft EWV Facility         Eastcroft         Nottingham         FCC         200         186         182           28         Lincolnshire EfW Facility         North Hykeham         Lincolnshire         FCC         190         171         172           46         Millerhill         Edinburgh         FCC         190         161         157           49         Javelin Park ERF         Javelin Park         Gloucestershire         Urbaser         190         181         187           21         LeedS         LeedS         LeedS         Veolia         190         181         187           31         Baldovie Waste To Energy Plant         Baldovie         Dundee         MVV         175         161         182           29         Kirklees EfW Facility         Kirklees         Huddersfield         Suez         150         134         120           25         Full Circle Generation EfW         Baldesley         Warw	22	Integra South West ERF	Marchwood	Southampton	Veolia	220	210	200
24         Stoke EfW Facility         Hanford         Stoke-on-Trent         MESE/Cobalt         210         185         194           26         Eastcroft EfW Facility         Eastcroft         Nottingham         FCC         200         186         182           48         Parc Adfer ERF         Parc Adfer         Deeside         enfinium         200         192         198           28         Lincolnshire         FCC         190         171         172           49         Millerhill Recycling and ERC         Millerhill         Edinburgh         FCC         190         161         157           49         Javelin Park ERF         Javelin Park         Gloucestershire         Urbaser         190         181         187           18         Baldovie         Waster To Energy Plant         Baldovie         Dundee         MVV         175         161         182           29         Kirklees EfW Facility         Kirklees         Huddersfield         Suez         150         134         120           52         Full Circle Generation EfW         Belfast ACT         Belfast         FCG         144         49         99           56         Baddesley EfW         Baddesley         Warwickshire	23	Integra South East ERF	Portsmouth	Portsmouth	Veolia	220	200	206
Construction         Data of the problem         Data of the problem         Data of the problem         Data of the problem           26         Eastcroft EW Facility         Eastcroft         North Hykeham         Lincolnshire         FCC         200         186         182           28         Lincolnshire EfW Facility         North Hykeham         Lincolnshire         FCC         190         171         172           46         Millerhill         Edinburgh         FCC         190         161         157           49         Javelin Park ERF         Javelin Park         Gloucestershire         Urbaser         190         181         187           31         Baldovie Waste To Energy Plant         Baldovie         Dundee         MVV         175         161         182           44         Glasgow REC         Glasgow ACT         Glasgow         Viridor         154         99         132           29         Kirklees         Huddersfield         Suez         150         134         120           52         Full Circle Generation EfW         Belfast ACT         Belfast         FCG         144         49         99           56         Baddesley EfW         Batdesley         Warwickshire         Kantor <td>24</td> <td>Stoke FfW Facility</td> <td>Hanford</td> <td>Stoke-on-Trent</td> <td>MESE/Cobalt</td> <td>210</td> <td>185</td> <td>194</td>	24	Stoke FfW Facility	Hanford	Stoke-on-Trent	MESE/Cobalt	210	185	194
Locksoft         Floating failt         Floating failt         Floating failt         Floating failt           48         Parc Adfer ERF         Parc Adfer         Deeside         enfinium         200         192         198           28         Lincolnshire EfW Facility         North Hykeham         Lincolnshire         FCC         190         171         172           46         Millerhill         Edinburgh         FCC         190         161         157           49         Javelin Park ERF         Javelin Park         Gloucestershire         Urbaser         190         181         187           31         Baldovie Waste To Energy Plant         Baldovie         Dundee         MVV         175         161         182           29         Kirklees         Huddersfield         Suez         150         134         120           29         Kirklees         Huddersfield	26	Eastcroft EfW Eacility	Fastcroft	Nottingham	FCC	200	186	182
Index Lab	48	Parc Adfer FRF	Parc Adfer	Deeside	enfinium	200	192	198
Inconstruction         Food	28	Lincolnshire EfW Facility	North Hykeham	Lincolnshire	FCC	190	171	172
Hole Hun Recycling and LNC         Nimerhain         Exhibiting         For the series	16		Millerhill	Edipburgh	FCC	100	161	157
149Datemin arkDiduces faileDiduser15015110327LeedsLeedsVeolia19018118728Baldovie Waste To Energy PlantBaldovieDundeeMVV17516118229Kirklees To Energy PlantBaldovieDundeeMVV17516118229Kirklees EfW FacilityKirkleesHuddersfieldSuez15013412052Full Circle Generation EfWBelfast ACTBelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338 <td>10</td> <td></td> <td>lavelin Park</td> <td>Gloucestershire</td> <td>l lrhaser</td> <td>100</td> <td>101</td> <td>180</td>	10		lavelin Park	Gloucestershire	l lrhaser	100	101	180
127LeedsVeola13018118731BaldovieDundeeMVV17516118244Glasgow RRECGlasgow ACTGlasgowViridor1549913229Kirklees EfW FacilityKirkleesHuddersfieldSuez15013412052Full Circle Generation EfWBelfast ACTBelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211031Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999436Peterborough EfW FacilityLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesArney94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeter<	49			Giodestersnire	Vaalia	190	191	109
31BaldovieDurideMVV17316116244Glasgow RRECGlasgow ACTGlasgowViridor1549913229Kirklees EfW FacilityKirkleesHuddersfieldSuez15013412052Full Circle Generation EfWBelfast ACTBelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest Levenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower756753	21		Leeus	Dundee		190	101	107
44Glasgow RKECGlasgow AC1GlasgowVirdor1549913229Kirklees EfW FacilityKirkleesHuddersfieldSuez15013412052Full Circle Generation EfWBelfast ACTBelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec/Viridor6	31	Baldovie Waste To Energy Plant	Baldovie	Dundee		1/5	101	102
29NITKIEES ETW FacilityKITKIEESHudderstieldSuez15013412052Full Circle Generation EfWBelfast ACTBelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez55	44					154	99	132
52FUIL CIrcle Generation ETWBelfast AC1BelfastFCG144499956Baddesley EfWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515137Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland Islands <td>29</td> <td></td> <td></td> <td></td> <td>Suez</td> <td>150</td> <td>134</td> <td>120</td>	29				Suez	150	134	120
bit Baddesley ETWBaddesleyWarwickshireKantor130717432Wolverhampton EfW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotalsTotalsSHEAP (P)26	52		Belfast ACI	Belfast	FCG	144	49	99
32Wolverhampton ErW FacilityWolverhamptonWolverhamptonMESE/Cobalt11811211033Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesArney94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotalsTotalsSHEAP (P)261923	56		Baddesley	vvarwickshire	Kantor	130	/1	/4
33Integra North ERFChinehamHampshireVeolia1101059730Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWs10,0167	32	Wolverhampton EtW Facility	Wolverhampton	Wolverhampton	MESE/Cobalt	118	112	110
30Bolton ERFBoltonGtr ManchesterSuez107426534Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotalsTotals117,52214,94115,323	33	Integra North ERF	Chineham	Hampshire	Veolia	110	105	97
34Dudley EfW FacilityDudleyDudleyMESE/Urbaser105979335Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotalsTotals17,52214,94115,323	30	Bolton ERF	Bolton	Gtr Manchester	Suez	107	42	65
35Battlefield EfW FacilityBattlefieldShropshireVeolia102999453Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotals17,52214,94115,323	34	Dudley EfW Facility	Dudley	Dudley	MESE/Urbaser	105	97	93
53Levenseat Renewable EnergyLevenseat ACTWest LothianLevenseat97505542Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotals17,52214,94115,323	35	Battlefield EfW Facility	Battlefield	Shropshire	Veolia	102	99	94
42Milton Keynes Waste Recovery ParkMilton Keynes ACTMilton KeynesAmey94565636Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotals17,52214,94115,323	53	Levenseat Renewable Energy	Levenseat ACT	West Lothian	Levenseat	97	50	55
36Peterborough EfW FacilityPeterboroughPeterboroughViridor85819137Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotals100167	42	Milton Keynes Waste Recovery Park	Milton Keynes ACT	Milton Keynes	Amey	94	56	56
37Enviropower Ltd, LancingLancingWest SussexEnviropower75675338Exeter ERFExeterDevonPaprec/Viridor60606039Integrated Waste Management FacilityNewLincsNE LincolnshirePaprec56515157Charlton Lane Eco ParkEco Park ACTSurreySuez5502740Energy Recovery PlantGremistaShetland IslandsSHEAP (P)261923Other EfWsTotals100167	36	Peterborough EfW Facility	Peterborough	Peterborough	Viridor	85	81	91
38     Exeter     Devon     Paprec/Viridor     60     60     60       39     Integrated Waste Management Facility     NewLincs     NE Lincolnshire     Paprec     56     51     51       57     Charlton Lane Eco Park     Eco Park ACT     Surrey     Suez     55     0     27       40     Energy Recovery Plant     Gremista     Shetland Islands     SHEAP (P)     26     19     23       Other EfWs     Totals     Totals     17,522     14,941     15,323	37	Enviropower Ltd, Lancing	Lancing	West Sussex	Enviropower	75	67	53
39     Integrated Waste Management Facility     NewLincs     NE Lincolnshire     Paprec     56     51     51       57     Charlton Lane Eco Park     Eco Park ACT     Surrey     Suez     55     0     27       40     Energy Recovery Plant     Gremista     Shetland Islands     SHEAP (P)     26     19     23       Other EfWs     Totals     Totals     17,522     14,941     15,323	38	Exeter ERF	Exeter	Devon	Paprec/Viridor	60	60	60
57         Charlton Lane Eco Park         Eco Park ACT         Surrey         Suez         55         0         27           40         Energy Recovery Plant         Gremista         Shetland Islands         SHEAP (P)         26         19         23           Other EfWs         100         167           Totals         17,522         14,941         15,323	39	Integrated Waste Management Facility	NewLincs	NE Lincolnshire	Paprec	56	51	51
40         Energy Recovery Plant         Gremista         Shetland Islands         SHEAP (P)         26         19         23           Other EfWs         100         167           Totals	57	Charlton Lane Eco Park	Eco Park ACT	Surrey	Suez	55	0	27
Other EfWs         100         167           Totals         17,522         14,941         15,323	40	Energy Recovery Plant	Gremista	Shetland Islands	SHEAP (P)	26	19	23
Totals 17,522 14,941 15,323		Other EfWs					100	167
				Totals		17,522	14,941	15,323



# EfWs In Construction / Commissioning

					Financial	Capacity
	Permitted Name	Known As	Location	Developer	Close	(ktpa)
C12	Isle of Wight EfW	Isle of Wight	Isle of Wight	Thalia	Q2 2017	30
C15	Hooton Park Sustainable Energy	Hooton Park ACT	Merseyside	BWSC/Cogen	Q4 2018	266
C16	Bridgwater Resource Recovery	Bridgwater	Somerset	Equitix/Iona	Q4 2018	123
C17	Earls Gate Energy Centre	Earls Gate	Falkirk	Brockwell/Encyclis	Q4 2018	236
C19	Lostock Sustainable Energy Plant	Lostock	Cheshire West	FCC/CIP	Q1 2019	600
C20	NESS EfW Facility	NESS	Aberdeenshire	Indaver/Acconia	Q3 2019	150
C21	Newhurst ERF	Newhurst	Leicestershire	Biffa/Encyclis	Q1 2020	350
C22	Drakelow Energy Generation Facility	Drakelow ACT	Derbyshire	Vital Energi	Q1 2020	170
C24	Protos Refuse Derived Fuel Plant	Protos	Cheshire West	Biffa/Encyclis	Q4 2020	410
C25	Slough Multifuel	Slough	Slough	SSE/CIP	Q4 2020	480
C26	Skelton Grange EfW	Skelton Grange	Leeds	enfinium	Q4 2021	435
C27	Oldhall Energy Recovery Facility	Oldhall	North Ayrshire	Octopus	Q4 2021	186
C28	Kelvin Energy Recovery Facility	Kelvin Way	West Bromwich	enfinium	Q4 2021	400
C29	Westfield Energy Recovery	Westfield	Fife	Viridor/Equitix	Q4 2021	250
C30	Edmonton EcoPark (Replacement)	Edmonton	Enfield	NLWA (P)	Q4 2021	
C31	Rivenhall IWMF	Rivenhall	Essex	Indaver	Q2 2022	595
C32	South Clyde Energy Centre EfW	South Clyde	Glasgow	Fortum	Q3 2022	385
C33	Riverside Energy Park	Riverside 2	Bexley	Cory	Q4 2022	650
				Total		5,716

Note that no additional EfW capacity reached financial close in Q1 2023.

## Mothballed / Decommissioned EfW

						Processe	ed (ktpa)
	Permitted Name	Known As	Location	Last Operator	Date	2021	2022
M1	Sinfin IWTC	Sinfin Road ACT	Derby	Renewi	Aug-19	0	0
M2	Hoddesdon EfW Plant	Hoddesdon ACT	Hertfordshire	BIG	Jan-22	36	0
М3	No permit	Newport	Newport	Vogen/Aviva	Apr-23	0	0
				Total		37	0

#### **Residual Waste Co-Incinerated in the UK**



In 2022, 10 cement and lime kilns (out of 11 operational facilities in the UK) accepted a total of 493kt of SRF under EWC code 19 10 12. This was a 28% increase on the tonnage in the previous year reflecting investment activity at several kilns. The total tonnages of other wastes co-incinerated at these facilities were broadly in line with previous years.

In addition, in 2022 two facilities, originally consented for the processing of biomass, accepted 18kt of Refuse Derived Fuel ("RDF").



## **APPENDIX 2: DATA SOURCES**

APR have either been provided by operators or released under the Freedom of Information Act.

- EA <u>Contains public sector information licensed under the Open Government Licence v3.0</u>
- NIEA Contains public sector information licensed under the Open Government Licence v3.0
- NRW <u>Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All</u> rights reserved.
- SEPA <u>Contains SEPA data © Scottish Environmental Protection Agency and database right 2022. All rights</u> <u>reserved.</u>
- (1) <u>http://www.wastedataflow.org/</u> Q100 for four quarters Apr 2021 Mar 2022
- (2) Digest of UK Energy Statistics ("DUKES") 2022 Table 5.5 <u>https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2022</u>
- (3) 2021 Pollution Inventory Dataset https://environment.data.gov.uk/portalstg/home/item.html?id=7ddf166a9b41444ebdca1baec1eede38
- (4) <u>https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020</u>

# **APPENDIX 3: GLOSSARY**

Advanced Conversion Technology
Air Pollution Control residue
Annual Performance Reports
Commercial and Industrial Waste
Environment Agency
Energy from Waste (facilities)
Emission Limit Value
European Waste Catalogue
Incinerator Bottom Ash
'000s tonnes (per annum)
Local Authority Collected Waste
Million tonnes (per annum)
Net Calorific Value
Northern Ireland Environment Agency
Natural Resources Wales
Pollution Inventory
Refuse Derived Fuel
Solid, non-hazardous, combustible waste which remains after recycling either treated (in the form of RDF or SRF) or untreated (as "black bag" waste).
Scottish Environmental Protection Agency
Solid Recovered Fuel



The Waste and Bioenergy Experts



Adrian Judge



Chris Jonas



Sally Freshwater



Tolvik Consulting Ltd is a privately-owned specialist provider of independent market analysis, commercial due diligence and advisory services across the waste and biomass sectors.

Our clients include the UK's leading waste companies, project finance investors, developers, and equity investors.

This report has been written by Tolvik Consulting Ltd on an independent basis using our knowledge of the current UK waste market and with reference inter alia to various published reports and studies and to our own in-house analysis.

This report has been prepared by Tolvik Consulting Ltd with all reasonable skill, care, and diligence as applicable. Whilst we have taken reasonable precautions to check the accuracy of information contained herein, we do not warrant the accuracy of information provided.

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