

UK Energy from Waste Statistics – 2016



June 2017

INTRODUCTION

This report brings together data on the UK Energy from Waste (“EfW”) sector from a range of sources into a single document. The objective is that, over time, “UK Energy from Waste Statistics” will become a consistent and reliable source of data on the sector and of benefit to industry, investors, students and policymakers.

The focus of this report is upon those EfW facilities generating energy from the combustion of Residual Waste during 2016. Residual Waste is defined as non-hazardous, solid, combustible mixed waste which remains after recycling activities. This definition is broader than that for Municipal Waste and includes Refuse Derived Fuel (“RDF”) as well as unprocessed waste. Inputs comprise primarily of wastes falling within European Waste Catalogue (“EWC”) 191210, 191212 and 200301.

The report excludes EfW facilities in Jersey and the Isle of Man, cement kilns and facilities solely processing Waste Wood or other biomass wastes.

Whilst much of the information in the report has been sourced from the public domain, commercially sensitive information has also been incorporated into the report and where this data has been utilised it has been aggregated so as to maintain confidentiality.

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Front Cover Image: Leeds EfW, fully operational 2016 Courtesy: Veolia

1. MARKET OVERVIEW

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

In December 2016 there were 37 operational EfWs in the UK, with a further 4 in commissioning, providing a total Headline Capacity of 11.76Mtpa. There was a further 4.08Mtpa of EfW capacity in construction. Based on an estimated average capital cost (in 2016 terms) of £750 per tonne of installed Headline Capacity, this is the equivalent to a £11.9 billion investment in the sector.

Mtpa	Fully Operational	In Commissioning	Total Headline Capacity	In Construction	Total
2014	6.77	1.65	8.42	N/A	N/A
2015	8.87	1.21	10.09	4.16	14.25
2016	10.48	1.28	11.76	4.08	15.84

Figure 1: Headline Capacity (as at December 2016)

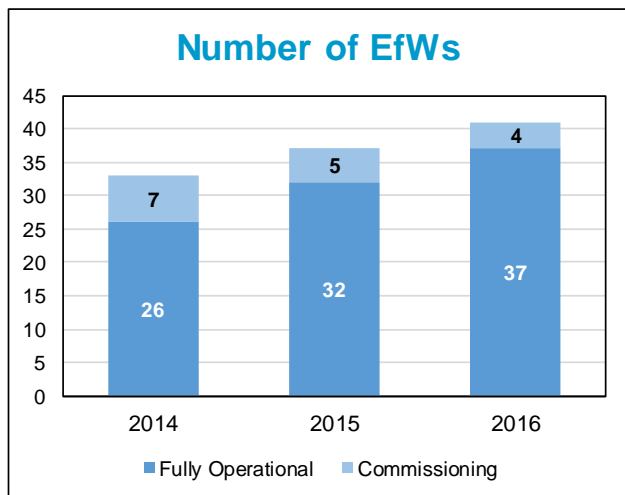


Figure 2: Number of EfW Facilities

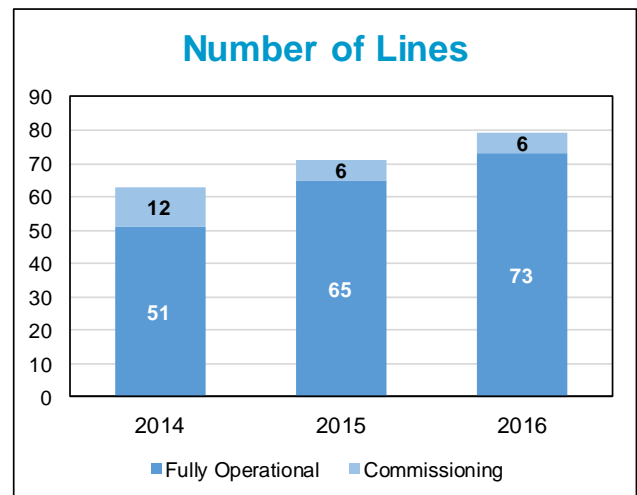


Figure 3: Number of Lines at EfW Facilities

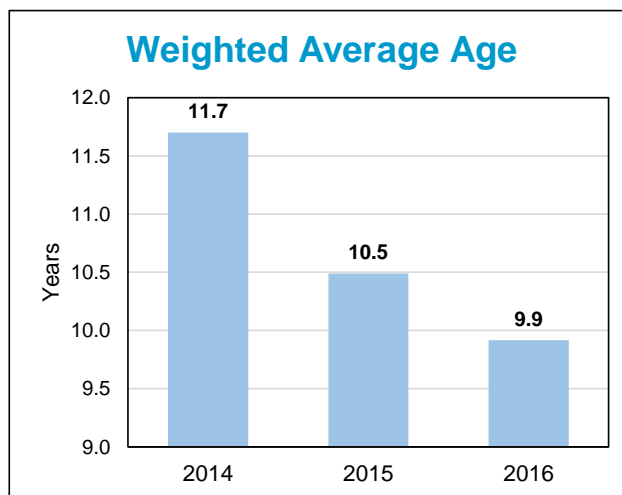


Figure 4: Weighted Average Age by Headline Capacity (as at December 2016)

2. WASTE INPUTS

In 2016 a total of 9.96Mt of Residual Waste was processed in UK EfWs, an increase of 18% on the 2015 figure. These inputs were the equivalent, for EfWs operational throughout the year, of 92.7% of the Headline Capacity.

Mt	Input Tonnage	Inputs as % of Headline Capacity
2014	6.72	88.2%
2015	8.45	89.0%
2016	9.96	92.7%

Figure 5: Annual EfW Inputs

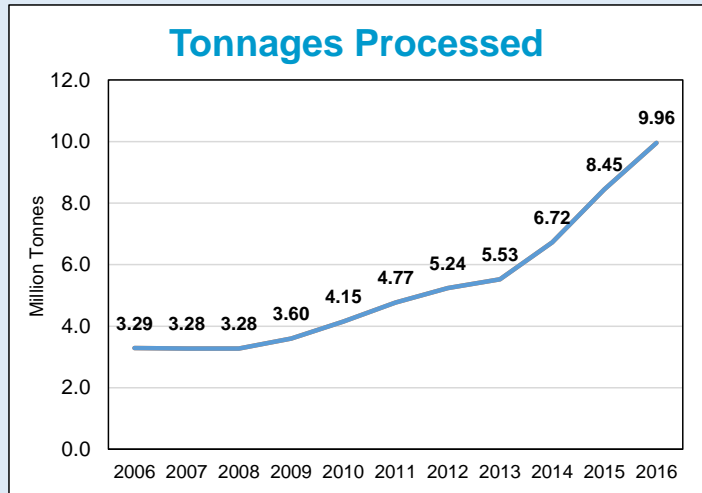


Figure 6: Total Tonnage of waste accepted at EfWs in 2006-2016
Source: Annual Performance Reviews ⁽¹⁾

The Role of EfW in the UK Residual Waste Market

It is estimated that the 2016 inputs to EfWs represented 35.4% (2015: 30.7%) of the overall UK Residual Waste market. Significantly, for the first time, in 2016 the proportion of Residual Waste going to landfill (at 48.5%) fell below 50%.

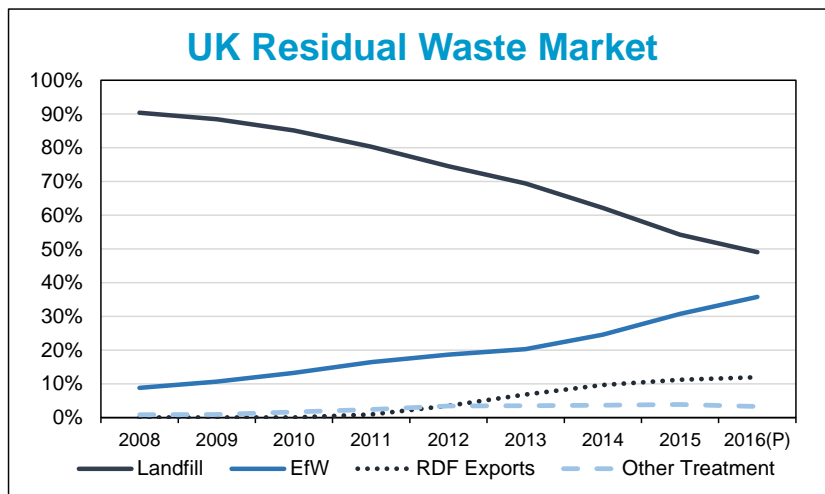


Figure 7: Development of the UK Residual Waste Treatment; 2016 Provisional Source: Tolvik Analysis

EfW Inputs by Waste Source and Type

Based on a detailed review of Wastedataflow⁽²⁾ for 2015/16, it is estimated that 85.1% of all EfW inputs are derived from Residual Local Authority Collected Waste (“LACW”) and the remainder Commercial and Industrial (“C&I”) Waste. This is broadly unchanged from the previous year.

In 2015/16 it is estimated that 47% of Residual LACW was sent to EfWs in the UK, and a further 10% exported as RDF.

Waste Source	LACW	C&I Waste
2014/15	85.4%	14.6%
2015/16	85.1%	14.9%

Figure 8: Inputs by Waste Source Source: Wastedataflow

Waste Type	Untreated Residual	RDF
2015	N/A	N/A
2016	82.5%	17.5%

Figure 9: Inputs by Waste Type Source: Tolvik Analysis

Untreated Residual Waste (EWC 20 03 01) was the principle input to EfWs in 2016 with an estimated 82.5% of total inputs.

Operator Market Shares

In 2016 Veolia and Viridor had the greatest market share by operator based on input tonnages.

Operator	Input (kt)	Share
Veolia	2,374	23.8%
Viridor	2,182	21.9%
Suez	1,210	12.1%
FCC	1,150	11.6%
Public Sector	938	9.4%
Cory	753	7.6%
MFE	573	5.8%
MES	386	3.9%
Other	393	3.9%
Total	9,960	100.0%

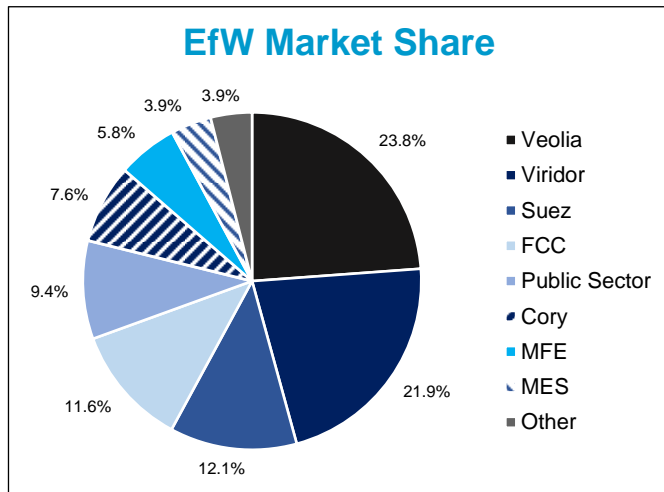


Figure 10: 2016 Share of Input Tonnage (includes Joint ventures) Source: Tolvik Analysis

3. ENERGY

Total power exported by EfWs in the UK in 2016 was 5,208GWh – approximately 1.8% of total UK generation in 2016 and a 12% increase on 2015. The average power generated per tonne of input fell during 2016 when compared with 2015, as a couple of larger EfWs experienced lower power export than expected due to turbine issues during the year.

	Gross Power Generation GWh _e	Net Power Export GWh _e	Parasitic Load (excl. power import)	Parasitic Loan (incl. power import)	Average Net kWh/tonne input	Net Heat Export GWh _{th}
2014	3,936	3,368	14.4%	N/A	492	N/A
2015	5,460	4,636	15.1%	N/A	549	553
2016	6,152	5,208	14.8%	15.3%	524	730

Figure 11: 2016 Power Generation Source: Tolvik analysis

Using the same calculation basis as that used for 2015, in 2016 there was little change in the average parasitic load (at 14.8%) when compared with 2015. Future reports will include imported energy in the calculation of parasitic load; in 2016 using this revised calculation basis increased the average parasitic load by 0.5%.

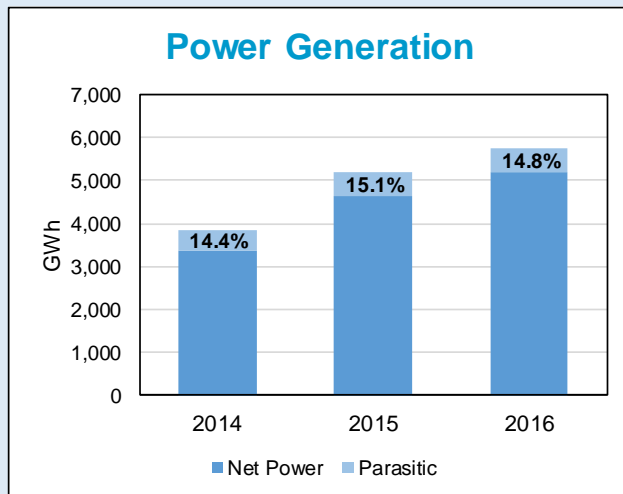


Figure 12: Power Generation from EfW

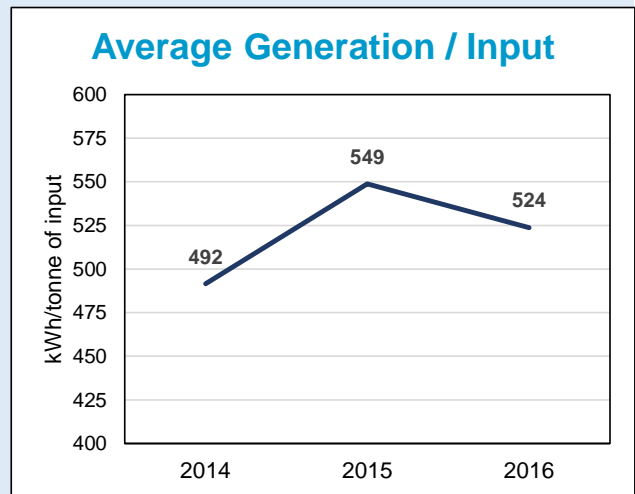


Figure 13: Average Power Generation per tonne of input

Beneficial Heat Use

In 2016 only 8 EfWs in the UK exported heat for beneficial use alongside power.

Total export in 2016 is estimated to have been 730GWh (2015: 553GWh) of which more than 50% relates to Runcorn. Across all EfWs, this is the equivalent of 75kWh/tonne of inputs (2015: 55kWh/tonne).

Power: Benchmarking

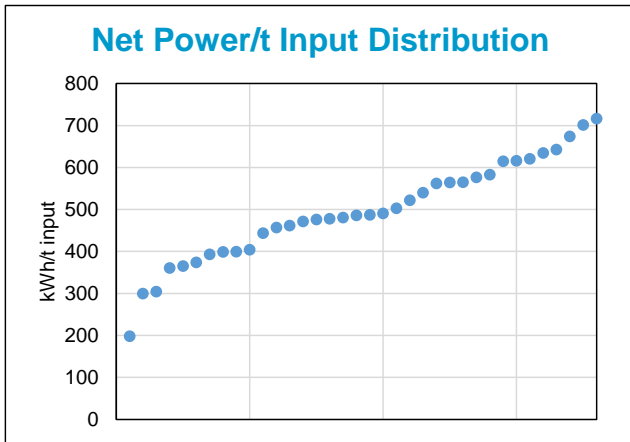


Figure 14: 2016 Net Power generated per tonne of Input
Source: Tolvik analysis

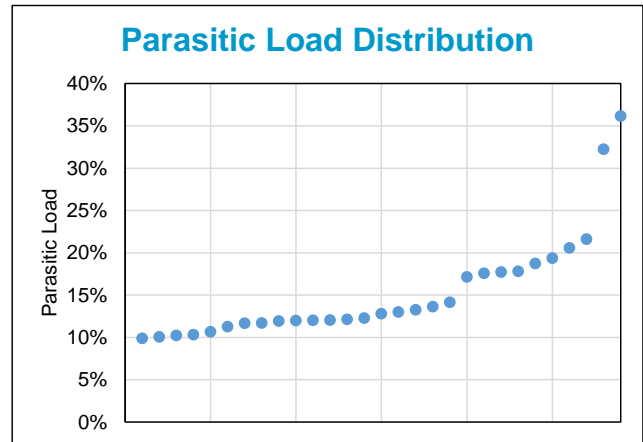


Figure 15: 2016 Parasitic Load Distribution
Source: Tolvik analysis

Figures 14 and 15 show the distribution, for each EfW for which data was reported, of the average net power exported per tonne of input and the average parasitic power load for the year.

With an average 524kWh generated per tonne of waste input in 2016, the range across all EfWs was from 198kWh/t to 717kWh/t. The link between EfW capacity and net power export per tonne as suggested in *2015 UK Energy from Waste Statistics*, proved in 2016 to be weak with a number of other factors – including EfW age, reliability and waste input type having a material impact.

In 2016 EfWs parasitic loads ranged between 10% and 22% with an average 15.3%. The two outliers were Dundee and Lancing, with the latter believed to include fuel preparation within the reported parasitic load calculations.

Efficiency and R1

By December 2016 the number of EfWs accredited as R1 (“Recovery”) operations rather than disposal facilities had increased from 19 to 22. R1 facilities are permitted to import waste for combustion.

	# of R1 EfW	Total # of EfWs	R1 as % of Total
2014	5	33	15%
2015	19	37	51%
2016	22	41	54%

Figure 16: R1 EfWs by date of accreditation
Source: EA, NRW, SEPA

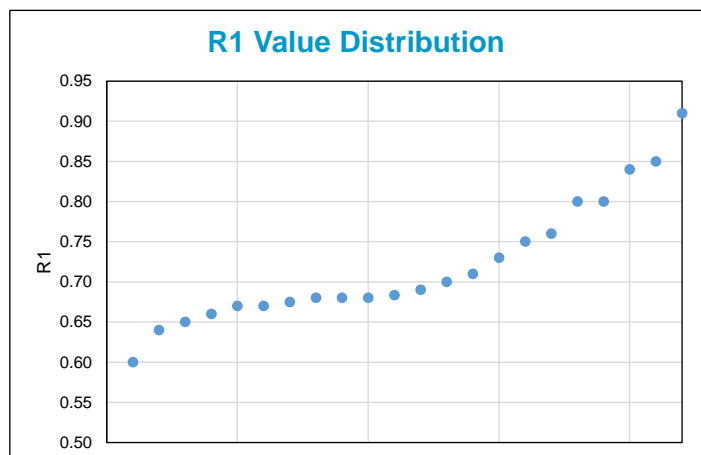


Figure 17: Calculated R1 for approved EfWs
Source: EA, NRW, SEPA

In order to be regarded as recovery, the minimum R1 value is 0.60 for an EfW in operation before 1 January 2009 and 0.65 for all others. The distribution of calculated R1 figures is shown in Figure 17 – those R1 assessments based on design calculations have still to be validated.

4. OPERATIONS

In 2016 average EfW availability, based on average operational hours reported on a line by line basis, increased to 90.2%. Average waste outputs, expressed as a percentage of inputs, were largely unchanged.

	Availability - Hours	% of Input Tonnage		
		Incinerator Bottom Ash ("IBA")	Air Pollution Control Residues ("APCr")	Metals Recovery (where reported)
2014	89.0%	20.3%	3.5%	1.9%
2015	88.3%	20.4%	3.5%	1.9%
2016	90.2%	20.2%	3.5%	1.9%

Table 18: Average Operational Data

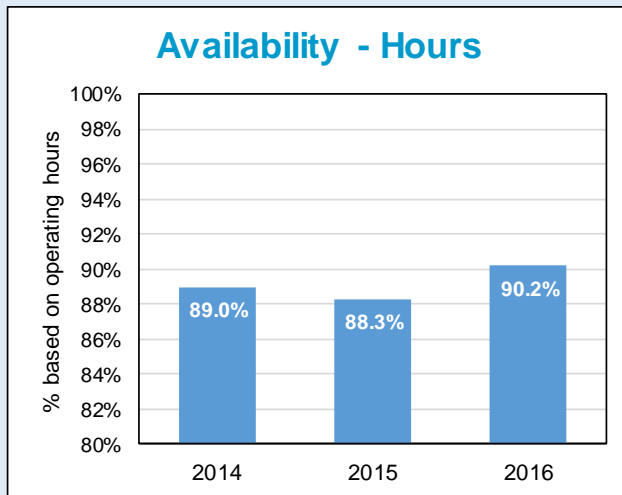


Figure 19: Average Availability - Hours

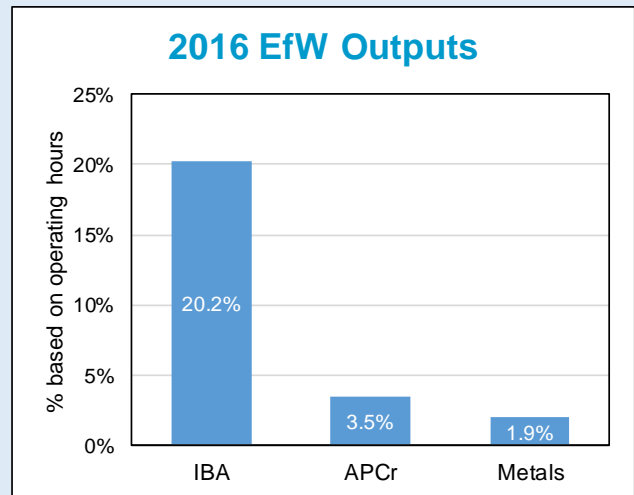


Figure 20: 2016 EfW Outputs

Availability

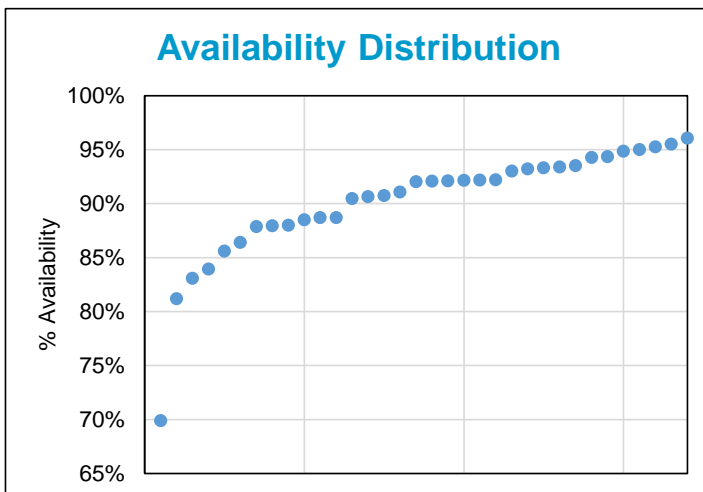


Figure 21: 2016 Availability Distribution Source: Tolvik Analysis

Operator	Average Availability
Veolia	94.3%
Cory	93.2%
Other	90.8%
MES	90.5%
Suez	90.2%
Viridor	88.8%
MFE	87.9%
FCC	86.5%
Public Sector	85.1%
Average	90.2%

Figure 22: 2016 Average Availability by Operator

With just one exception, in 2016 all EfWs had an average availability of more than 81%. The six EfWs with the highest reported availabilities were all operated by Veolia and it is little surprise to see that in 2016 their average availability, at 94.3% was the highest of all EfW operators.

Outputs

Incinerator Bottom Ash

In 2016 IBA accounted on average for 20.2% (2015: 20.4%) of all waste inputs.

IBA outputs expressed as a percentage of waste inputs generally fell within the 14% - 26% range save for Allington (which uses fluidised bed technology) and Lancing (with inputs being a mix of RDF and recycled wood). Almost all IBA is now recycled rather than landfilled.

Air Pollution Control Residues

In 2016, APCr generation was unchanged from 2016 at 3.5% of waste inputs.

The total generation of APCr in 2016 was reported to be 345kt, an increase of circa 16% on 2015. Allington produced the greatest portion of APCr as a percentage of inputs.

In 2016 it is estimated that 26% of APCr was recycled.

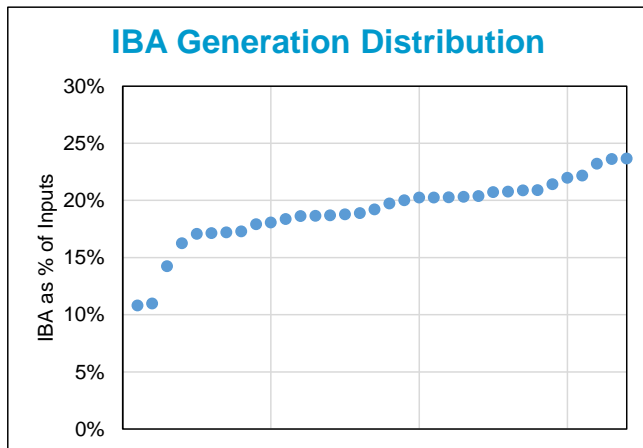


Figure 23: 2016 Distribution of IBA Generation (as % of inputs)
Source: Tolvik Analysis

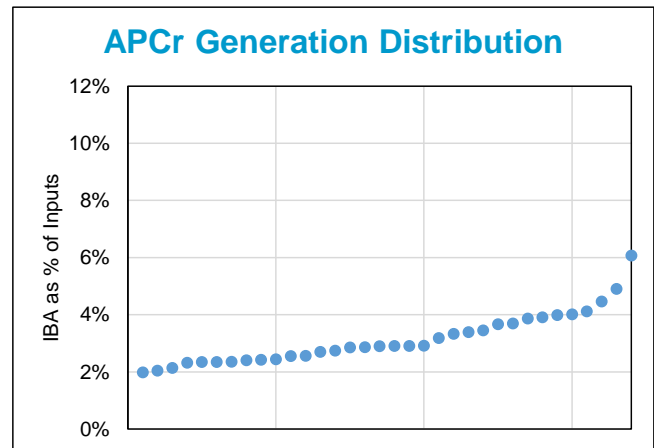


Figure 24: 2016 Distribution of APCr Generation (as % of inputs)
Source: Tolvik Analysis

Consumable Use

Data on the use of a range of consumables – water, lime (or other alkaline reagents), urea and carbon are increasingly being included in annual EfW returns. The data quality appears, in parts, somewhat variable and without more than one year of data it is not possible to draw any firm conclusions from the analysis. The available data has, however, been summarised and relates to “Specific Usage” – i.e. usage per tonne of input. Please note, it excludes those EfWs which use ammonia rather than urea as there are a limited number of data points.

Consumable	Unit	Low	Median	High
Total Water Usage (both potable and non-potable) -	m ³ / tonne input	0.00	0.41	2.24
Activated carbon or coke	kg/ tonne of input	0.03	0.36	1.79
(Hydrated) lime or sodium bicarbonate		3.92	11.61	30.91
Urea		0.04	1.61	3.39

Figure 25: 2016 Average Specific Consumable Usage Source: Tolvik analysis

Operational Risk Assessment (“OPRA”) Scores

All permitted facilities have an OPRA score or equivalent provided by the relevant regulatory authority. A score of A represents the “best” assessment. There has been no material change in OPRA scores over the last couple of years.

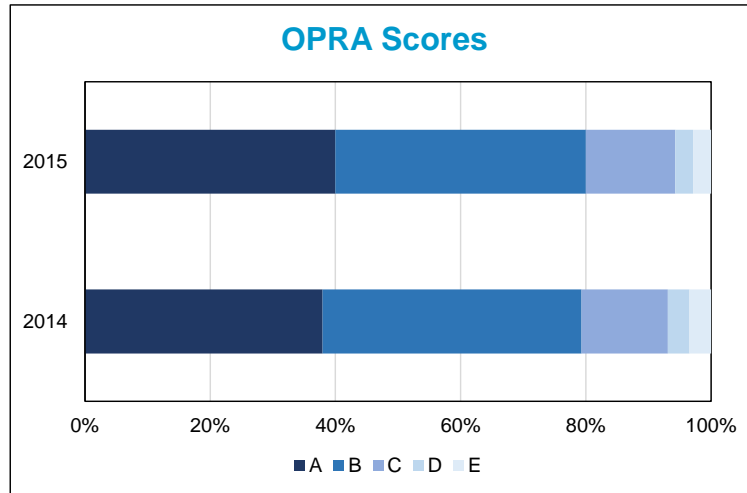


Figure 26: OPRA Scores Source: EA, SEPA, NRW

5. GATE FEES

Depending on the source/type of waste and contract duration, in 2016 median EfW gate fees ranged from £58/t to £95/t.

Excluding long term LACW contracts, in general EfW gate fees in the market were up on 2015. This reflects the increasing cost of alternatives – in particular landfill (where the number of operational landfills continued to decline and landfill tax rose) and RDF export (weak exchange rate, strengthening European EfW markets).

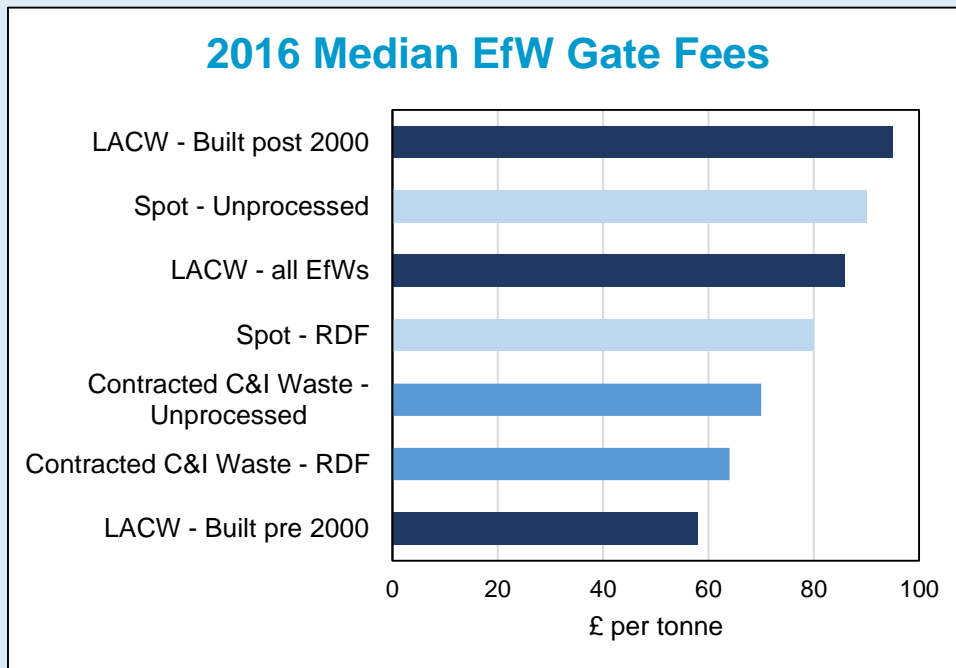


Figure 27: Median 2016 Gate Fees Sources: WRAP Gate Fee Report, Tolvik Analysis

LACW Gate Fees

The “WRAP Gate Fee Report”⁽³⁾ relates largely to LACW gate fees and the 2016 report calculates a median gate fee of **£86/t** – unaltered from 2015. That there has been no material change is not unsurprising – only 7 out of the 59 respondents to WRAP reported that they had entered into a new contract in the year and most long term contracts are subject to annual indexation.

Type of EfW Facility	Year	Gate Fee (per tonne)		
		Low	Median	High
Built pre - 2000	2015	£36	£73	£110
	2016	£22	£58	£90
Built post - 2000	2015	£65	£99	£132
	2016	£65	£95	£131
All EfWs	2015	£36	£86	£132
	2016	£22	£86	£131

Figure 28: Local Authority EfW Gate Fees Source: WRAP Gate Fees Report 2015/16

WRAP note that the movement in the sub-set median gate fees, particularly for EfWs built pre-2000, was a function of a sampling rather than any change in market conditions.

Many of these LACW gate fees are long term contracts delivered under Design, Build, Finance and Operate (“DBFO”) schemes and do not reflect “market” gate fees.

C&I Waste Contracted Gate Fees

In the last 24 months, a number of new “merchant” EfW facilities have been developed which are reliant upon long term (at least 5 years, more typically 10 + years) waste supply agreements for Residual C&I Waste rather than Residual LACW.

The gate fee data in Figure 29 has been compiled from a number of projects. It is based on contracts of minimum 5 years, with a credit worthy waste supplier and with a deferred commencement date (i.e. contract term only starts once the EfW is operational). There has been a rise in median long term gate fees over the last 12 months of around £6-£8/t - reflecting the impact of the increasing cost of alternatives treatment/disposal options for Residual C&I Waste - particularly RDF export costs.

Feedstock	Year	Gate Fee (per tonne)		
		Low	Median	High
RDF	2015	£52	£58	£68
	2016	£55	£64	£78
Unprocessed Residual Waste	2015	£55	£62	£78
	2016	£57	£70	£88

Figure 29: Contracted C&I Waste EfW Gate Fees Source: Tolvik Analysis

Spot/Short Term Gate Fees

The only other source of EfW gate fee income in the public domain is Letsrecycle.com⁽⁴⁾ which in December 2016 reported short term gate fees (i.e. contracts typically of 1-3 years duration) ranging from **£75/t to £105/t**. This is consistent with Tolvik’s own market information, with the lower figure for RDF rather than unprocessed Residual Waste.

Feedstock	Year	Gate Fee (per tonne)		
		Low	Median	High
RDF	2016	£75	£80	£105
Unprocessed Residual Waste	2016	£75	£92	£105

Figure 30: Short Term EfW Gate Fees Source: Letsrecycle.com and Tolvik Analysis

6. MARKET DEVELOPMENTS

Section 1 identified Headline Capacity of 15.84Mt which was operational or in construction as at December 2016. In the period to end April 2017, a further 0.08Mt of Headline Capacity has been consented though an extension of capacity at Trident Park.

The Headline Capacity should not be used as the basis for projecting future EfW capacity in an analysis of the UK Residual Waste market. This should instead be based on the projected level of EfW inputs – the “Operational Capacity”. It is estimated, based solely upon those EfWs which (as at December 2016) were either operational or in construction, the Operational Capacity in 2020 will be **14.70Mt**.

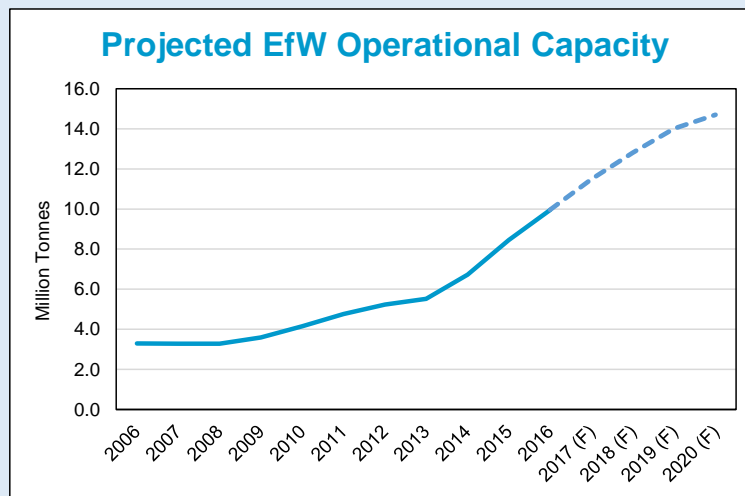


Figure 31: Projected UK EfW Inputs

The projected Operational Capacity figure assumes:

- ◆ No additional EfW Capacity is developed and no EfWs are decommissioned;
- ◆ For EfWs operational in 2016: the Operational Capacity is based on average inputs over 5 years (or shorter period for newer EfWs); and
- ◆ For EfWs in construction in 2016: the Operational Capacity will be 95% of the Headline Capacity.

Decommissioning

Two EfWs which have effectively been decommissioned since 2015:

- ◆ Avonmouth ACT;
- ◆ Isle of Wight ACT.

Both are being or are expected to be reconstructed and so have been included within this report.

Similarly it is expected that the 150ktpa Baldovie facility in Dundee will, in due course, be decommissioned and replaced by a new 110ktpa facility for which planning has recently been granted. Planning consent has also been granted for a 700ktpa EfW in North London to replace the existing London EcoPark facility.

Additional EfW Capacity

The Operational Capacity beyond 2020 will be dependent on whether additional EfW facilities are developed. Recent trends suggest that the EfWs most likely to be developed will either be ACT facilities benefitting from subsidy support or larger scale EfWs based on conventional moving grate technologies.

In April 2017 bids were submitted by developers of **ACT** projects seeking support under the Contracts for Difference (“CfD”) mechanism. This, the second bidding round, has a total funding pot of £290m and with decisions expected by autumn 2017.

The expectation is that the process will be very competitive, with ACT developers seeking funding from the same “pot” as offshore wind. It is understood from several sources that there could have been as many as 30 applications for support for ACT projects. With this level of competition there is the potential that the level of support awarded to successful ACT projects may not always be sufficient for them to be commercially viable. Tolvik therefore expects only a small portion of these facilities to be financed and built.

The recent strengthening of the Residual Waste market (both in terms of tonnages and gate fees) and the successful financing of key projects has led to a renewed interest in larger scale EfW facilities. Figure 32 identifies EfWs with an anticipated capacity of greater than 300ktpa where there was development activity during 2016-17. Self-evidently not all of these facilities will be constructed.

Local Authority	Facility	Developer	Capacity	Latest development
Stockton-on-Tees	Billingham	Gaia Power	50MW	Planning consent amended from biomass to RDF
Enfield	Edmonton	NLWA	700kpa	Planning consent granted for replacement to London EcoPark
Central Beds	Rookery South	Veolia/Covanta	480ktpa	Development partnership confirmed
Cheshire West & Chester	Protos	Peel	350ktpa	Planning consent granted
Essex	Rivenhall	Gent Fairhead	595ktpa	Permit refused and revised application submitted. Has CfD from Round 1
Slough	Multifuel	SSE	50MW	Finalisation of planning consent
Hertfordshire	Rye House	Veolia	320ktpa	Planning application submitted for alternative facility for Hertfordshire LACW contract
Leicestershire	Newhurst	Biffa	350ktpa	Biffa reported in IPO - discussions with potential partners continue
Cheshire West & Chester	Lostock	TATA	60MW	Developer seeking to discharge planning consent conditions, prior to expiry of consent in October 2017

Figure 32: Large scale EfWs in active development

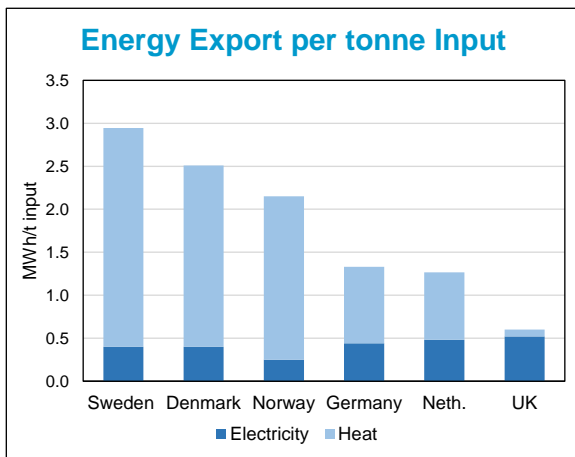
7. INTERNATIONAL BENCHMARKS

This report has pulled together the latest available published EfW data from other northern European countries for the purposes of a comparison with the UK EfW market. There will be differences in the categorisation of EfW facilities and in the calculation/measurement methodologies applied, but it is hoped that the data provides a useful high level overview of some key operational metrics.

Country	Reported Inputs (Mt)	Associated Capacity (Mt)	Inputs as % of Headline Capacity
Sweden	5.78	6.27	92.0%
Denmark	3.48	3.79	91.7%
Norway	1.53	1.80	85.0%
Germany	22.93	24.38	94.4%
Netherlands	7.56	8.01	94.5%
UK	9.72	10.48	92.7%

Figure 33: Reported EfW data used for benchmarking Sources: As per Appendix 2

As Figure 34 shows, whilst in the UK EfWs are largely focussed on electricity export, in most other European markets energy is exported through a mix of power, hot water and steam.



Country	Electricity (MWh/t)	Heat (MWh/t)	Total (MWh/t)
Sweden	0.40	2.55	2.94
Denmark	0.40	2.11	2.51
Norway	0.25	1.90	2.15
Germany	0.44	0.89	1.33
Netherlands	0.48	0.78	1.26
UK	0.52	0.08	0.60

Figure 34: European Benchmarks – Energy Export

The UK's figures for ash and metal outputs are broadly in line with the rest of Europe.

Country	IBA	APCr	Metals
Sweden	16.7%	4.4%	
Denmark	17.0%	3.0%	
Germany	27.0%		2.4%
Netherlands	22.0%	2.5%	1.8%
UK	20.2%	3.5%	1.9%

Figure 35: European Benchmarks – Ash and Metal Outputs

APPENDIX 1: EfWs INCLUDED IN THE REPORT



Figure 36: Location of EfW facilities included in this report (Shetland Islands not shown)

Operational EfWs

	Name	Location	Local Authority	Operator	Headline Capacity	2016 Input
1	Riverside	Belvedere	Bexley	Cory	785,000	752,839
2	Tyseley	Birmingham	Birmingham	Veolia	400,000	351,208
3	Coventry	Coventry	Coventry	Public Sector	315,000	282,849
4	Dudley	Dudley	Dudley	MES	105,000	93,292
5	Newhaven	Newhaven	East Sussex	Veolia	242,000	233,013
6	Bolton	Bolton	Greater Manchester	Viridor	127,000	86,388
7	Chineham	Basingstoke	Hampshire	Veolia	110,000	97,997
8	Allington	Allington	Kent	FCC	500,000	513,454
9	Kirklees	Huddersfield	Kirklees	Suez	160,000	127,510
10	SELCHP	Lewisham	Lewisham	Veolia	488,000	448,235
11	NewLincs	Stallingborough	North East Lincolnshire	Other	56,000	54,855
12	London EcoPark	Edmonton	Enfield	Public Sector	620,000	547,721
13	Eastcroft	Eastcroft	Nottingham City	FCC	180,000	169,844
14	Portsmouth	Portsmouth	Portsmouth	Veolia	210,000	203,721
15	Sheffield	Sheffield	Sheffield	Veolia	245,000	235,334
16	Gremista	Shetlands	Shetland Islands	Public Sector	26,000	22,965
17	Baldovie	Dundee	Dundee	Public Sector	120,000	84,669
18	Lakeside	Colnbrook	Slough	Viridor	450,000	435,844
19	Marchwood	Southampton	Southampton	Veolia	210,000	204,045
20	Hanford	Stoke	Stoke-on-Trent	MES	210,000	182,069
21	Tees Valley	Haverton Hill	Stockton-on-Tees	Suez	756,000	610,168
22	Lancing	Lancing	West Sussex	Other	60,350	59,005
23	Wolverhampton	Wolverhampton	Wolverhampton	MES	118,000	110,759
24	Avonmouth ACT	Avonmouth	Bristol	Other	120,000	32,428
25	Marsh Barton	Exeter	Devon	Viridor	60,000	53,457
26	Runcorn	Runcorn	Halton	Viridor	850,000	867,715
27	North Hykeham	North Hykeham	Lincolnshire	FCC	170,000	163,580
28	Four Ashes	Cannock	Staffordshire	Veolia	340,000	339,946
29	Trident Park	Cardiff	Cardiff	Viridor	350,000	352,198
30	<i>Cornwall*</i>	<i>St Dennis</i>	<i>Cornwall</i>	<i>Suez</i>	<i>240,000</i>	<i>40,000</i>
31	Ardley	Ardley	Oxfordshire	Viridor	326,000	304,063
32	Peterborough	Fengate	Peterborough	Viridor	85,000	82,702
33	Devonport	Plymouth	Plymouth	Other	265,000	246,580
34	Shropshire	Battlefield	Shropshire	Veolia	102,000	94,421
35	Suffolk	Great Blakenham	Suffolk	Suez	269,000	266,539
36	Ferrybridge FM1	Ferrybridge	Wakefield	MFE	570,000	573,035
37	Greatmoor	Calvert	Buckinghamshire	FCC	300,000	267,479
38	Leeds	Cross Green	Leeds	Veolia	179,580	165,940
39	<i>Wilton 11</i>	<i>Middlesbrough</i>	<i>Middlesbrough</i>	<i>Suez</i>	<i>444,000</i>	<i>45,805</i>
40	<i>Sevenside*</i>	<i>Sevenside</i>	<i>South Gloucestershire</i>	<i>Suez</i>	<i>400,000</i>	<i>120,000</i>
41	<i>Hartlebury</i>	<i>Kidderminster</i>	<i>Worcestershire</i>	<i>FCC</i>	<i>200,000</i>	<i>36,094</i>
				Totals	11,763,930	9,959,766

Figure 37: Operational EfWs in 2016

NB those in italics were only operational for part of the year. * denotes estimated input data as actual figure not reported.

EfWs in Construction

	Name	Location	Local Authority	Operator	Headline Capacity
1	Polmadie ACT	Glasgow	Glasgow	Viridor	154
2	Beddington Lane	Croydon	Croydon	Viridor	275
3	Eco Park ACT	Shepperton	Surrey	Suez	55
4	Milton Keynes ACT	Milton Keynes	Milton Keynes	Other	90
5	Javelin Park	Gloucester	Gloucestershire	Other	190
6	Sinfin Road ACT	Derby	Derby City	Other	190
7	Allerton Park	Knaresborough	North Yorkshire	Other	320
8	Parc Adfer	Deeside	Flintshire	WTI	200
9	Millerhill	Millerhill	Edinburgh	FCC	163
10	Kemsley	Kemsley	Kent	WTI	550
11	Severn Road	Avonmouth	Bristol	Viridor	320
12	Dunbar	Dunbar	East Lothian	Viridor	300
13	Energy Works ACT	Hull	Kingston-upon-Hull	Other	227
14	Ferrybridge FM2	Ferrybridge	Wakefield	MFE	570
15	Hoddesdon ACT	Hoddesdon	Hertfordshire	Other	90
16	Levensat ACT	Fauldhouse	West Lothian	Other	180
17	Bombardier ACT	Belfast	Belfast	Other	180
18	Isle of Wight ACT	Isle of Wight	Isle of Wight	Other	30
Total					4,084

Figure 38: EfWs in construction in 2016

APPENDIX 2: DATA SOURCES

(1): Annual Performance Reviews released under Freedom of Information Act request:

EA (for England): <https://ea.sharefile.com/d-s3f7ca28097445138>.

SEPA (for Scotland): <http://apps.sepa.org.uk/disclosurelog/#> - information can be located in the link under the reference number F0187455.

NRW (for Wales): Report kindly provided by Viridor Waste Management.

NIEA (for N Ireland): Nil return.

(2): <http://www.wastedataflow.org/> accessed on 24 April 2017. Q100 for 4 quarters Apr 2015 – Mar 2016.

(3): <http://www.wrap.org.uk/collections-and-reprocessing/recovered-materials-markets/reports/gate-fee-report-2016>

(4): <http://www.letsrecycle.com/prices/efw-landfill-rdf-2/efw-landfill-rdf-2016-gate-fees/>

International Data

Country	Ref Year	Source
Sweden	2015	Avfall Sverige: Svensk Avfallshantering 2016
Denmark	2014	BEATE Benchmarking af affaldssektoren 2015 (data fra 2014) Forbrænding
Norway	2015	CEWEP Country Report 2016
Germany	2014	ITAD: Jahresbericht 2014
Netherlands	2015	Afvalverwerking in Nederlands, gegevens 2015

APPENDIX 3: GLOSSARY

ACT	Advanced Conversion Technology (i.e. gasification/pyrolysis)
APCr	Air Pollution Control residues
C&I Waste	Commercial and Industrial Waste
CfD	Contract for Difference
CHP	Combined Heat and Power
CV	Calorific Value
DBFO	Design, Build, Finance and Operate
DUKES	Digest of UK Energy Statistics
EA	Environment Agency
EfW	Energy from Waste
EWC	European Waste Catalogue
Headline Capacity	The maximum annual throughput contained within the Environmental Permit except where an operator has publicly reported an alternative figure.
IBA	Incinerator Bottom Ash
Kt (pa)	'000s tonnes (per annum)
LACW	Local Authority Collected Waste
Mt (pa)	Million tonnes (per annum)
NIEA	Northern Ireland Environment Agency
NRW	Natural Resources Wales
OPRA	Operational Risk Assessment
RDF	Refuse Derived Fuel
Residual Waste	Solid, non hazardous, combustible waste which remains after recycling either treated (in the form of an RDF or SRF) or untreated (as "black bag" waste).
SEPA	Scottish Environmental Protection Agency



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