



WASTE MANAGEMENT INDUSTRY REPORT

A crucial field with the ability to impact heavily on social and environmental welfare. We look at how the world responds to this demand, focusing on the UK market and in particular Greater Manchester. This report identifies key drivers shaping the industry, big market players and notable investment activity.

SEDULO

Contents

Executive Summary	04
The Current Market	05
What Drives the Waste Management Industry?	06
Valuing Waste Management Companies	09
Key Market Players	10
Mergers and Acquisitions	13
What Have We Done in the Industry	14
Waste Management Services	15
Political Landscape	17
Illegal Waste Trafficking	18
The Future of Waste Management	19
Bibliography	21

Author

Hannah Anderton

Design

Neil McAdam

The information enclosed within this report has been prepared by desktop research into a number of areas and by reference to other published research documents. Any reader must satisfy themselves as to the accuracy of the information contained herein. This report must not be relied upon as statements of representation of fact and Sedulo Group Limited, its partners and employees shall not be responsible for any error, omission or misstatement.

Neither the staff of Sedulo Group Limited nor any of its agents give any guarantees or warranties as to the information provided.

Sedulo Group

Manchester

62-66 Deansgate
M3 2EN

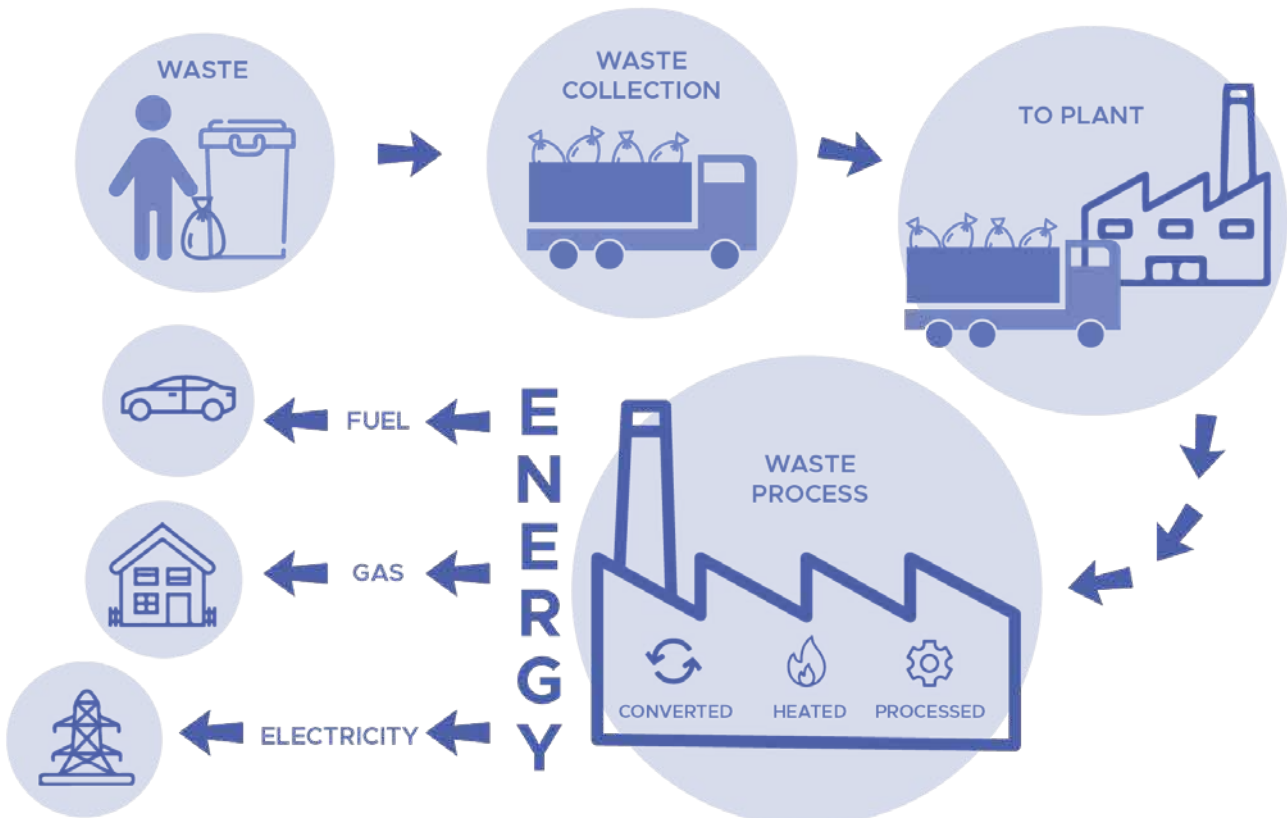
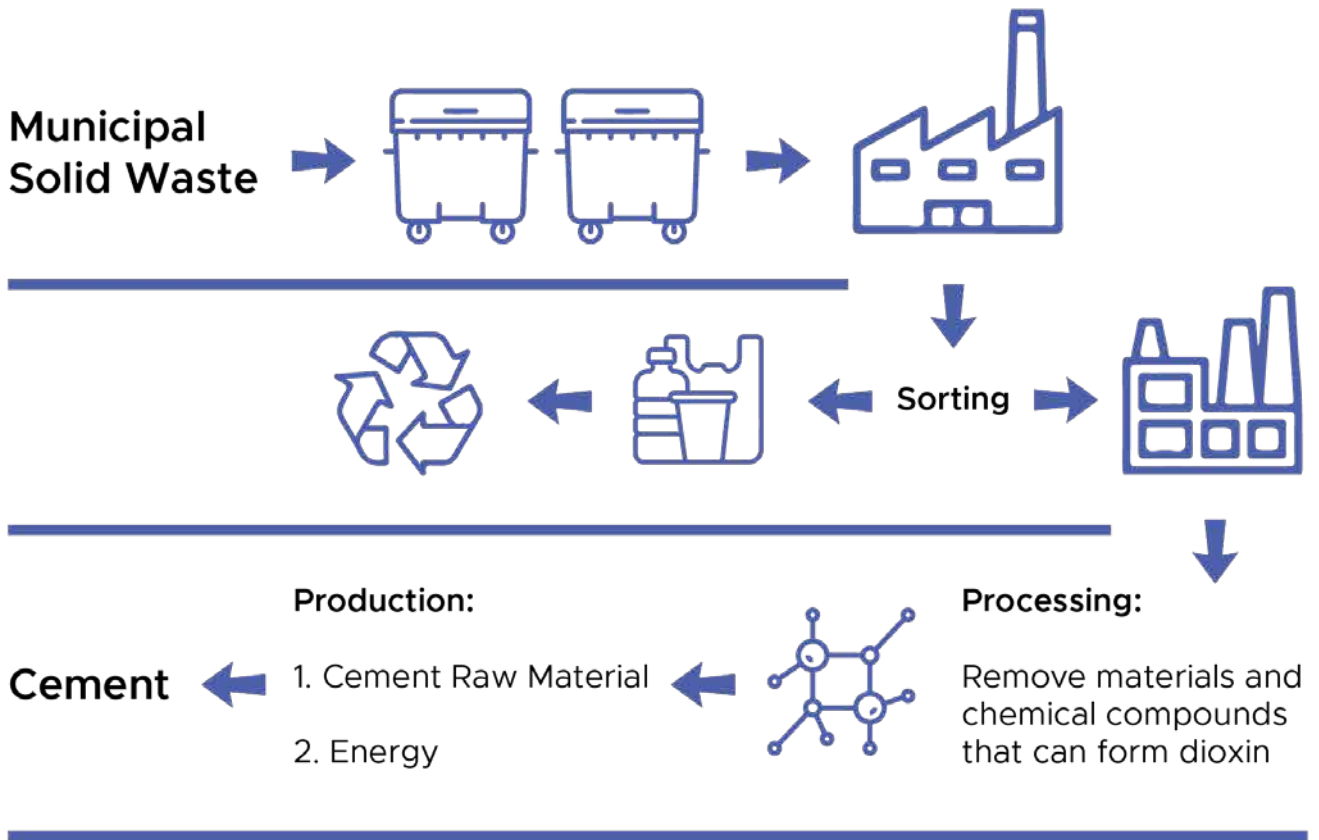
Leeds

St Paul's House
Park Square
LS1 2ND

London

Office 208,
Coppergate House,
10 Whites Row,
E1 7NF

MSW Eco-co-combustion Process



Executive Summary

Waste is defined as unwanted materials that require discarding and therefore the waste management industry is responsible for providing the means by which that can be done.

Waste can be considered somewhat a social construct; around the globe, there are various opinions as to what constitutes as waste and what doesn't, and different communities are disproportionately affected by the problem of waste. People based around waste sites often contend with above average pollution and environmental risks, which in turn can cause adverse effects on health. Waste management organisations are an important solution in order to prevent social inequality and ensure that sustainable methods for dealing with refuse are in place.

Up until the 1980s, in the UK, municipal waste management was a nationalised industry, meaning the government was responsible for the control and ownership of the market. Successive Conservative and New Labour governments facilitated the contracting out and privatisation of waste management, engendering a new market, that has developed and expanded to that which exists today. The industry has gone through a process of dismantling, with various companies providing a different step in the supply chain, to vertically reintegrating through mergers and acquisitions.

At the current rate, UK landfill sites are due to be full by 2022. This limited capacity has potentially disastrous consequences for the near future and

forthcoming generations. Around 45.4 million tonnes of waste are dumped in UK landfills annually, a rate that landfills simply cannot efficiently accommodate. In 2017, UK waste management company Biffa advised that landfill space would run out within ten years and so alternative routes for the afterlife of waste must be employed. Although potentially disastrous for society, this can be good news for the waste management industry as innovation becomes necessary and forward-thinking businesses can capitalise on their imperativeness.

The full process of waste management activities include collection, transportation, waste treatment and disposal. The waste management

industry is categorised based on the type of waste (municipal, industrial and hazardous), the type of service: collection (transport/storage/sorting) or disposal (landfill/recycling/composting/anaerobic digestion) and the region. The vast variety of services within waste management provide for the needs of different industries. Pages 15 to 16 cover an overview of the array of different areas within the waste management market. The services allow for consumers to benefit from waste at both ends of the supply chain. Households and businesses benefit from having their rubbish collected and disposed and they can benefit again through buying products, compost, construction material, and being provided with energy – all sourced from waste.



The Current Market

The global waste management market is projected to reach \$530 billion by 2025. The market has had to keep up with the development and influence of increasing environmental awareness, a rise in population sizes, industrialisation and urbanisation. Latest figures show, the UK waste industry generates an estimated £9 billion annual turnover. Although the waste management market has been slow to regain the same level of energy it expressed before the 2008 recession, the industry has still managed to maintain its growth at a better rate than the general UK economy.

Economically, it makes sense to invest in sustainable waste management. When not managed correctly, waste can have severe health and environmental effects; the cost of which outweighs the cost of competent waste management systems. Overall the markets' drivers outweigh its restrictions.

Former resource management minister Dan Rogerson identified export of our materials and knowledge on services as an area for potential growth for the industry within emerging markets. Domestically, the UK sector is not large enough to process all of the materials that get recovered through recycling. In addition to this, industry growth is slow in LEDCs due to lack of awareness for the necessity of comprehensive waste management and thus less investment occurs in waste management companies. In low income countries, over 90% of waste is disposed of in unregulated dumps or incineration, creating serious health, safety and environmental consequences. However, emerging economies in APAC and LAMEA are increasing their utility of these systems. Investing in markets in other countries would create a mutually beneficial environment of improving their operation ability whilst allowing for more efficient use of recovered

materials.

In the Greater Manchester area in particular, there are around 200 active waste management businesses. This contribution to the economy creates employment for nearly 4000 people and generates approximately £650m of sales. According to Eunomia, businesses in Greater Manchester produce 1.8 million tonnes of commercial and industrial waste per year, an estimated 367.5k tonnes of which are non-recyclable, however, 45% of which can be simply recycled. Providing services to businesses to manage these different waste types and developing new services to take advantage of materials with potential further use are identified as growth areas for waste management SMEs in the area.

Because businesses in the waste management industry are often heavily reliant on assets, it can be a challenge for them to expand organically. However, through acquiring additional facilities, waste management businesses have been able to consolidate and expand their reach. Furthermore, foreign investors have increased their appetite for acquiring UK businesses to form multinational operations.

What Drives The Waste Management Industry?

The waste management industry is fundamentally essential, and everyone around the globe relies on its proper functioning. In 2016 people around the world produced waste equivalent to 0.74 KG per person per day. Based on a current global population estimation of 7.8 billion people, that totals a whopping 5,772,000,000kg a day.

However, there are undoubtedly trends and factors that drive up the activity within the industry. Businesses are making more effort with the three Rs of waste management: reduce, reuse, recycle. This endeavour has helped

to shape the architecture for waste management, as companies in the industry adapt in order to provide the services to meet the objectives arising from commercial waste behaviours.

Government Initiatives/ Regulations

According to UK government Department for Environment, Food & Rural Affairs (Defra) 2019 UK statistics on waste, the recycling rate of waste from households rose to 45.7% in 2017. However, the UK needs to do more to achieve the EU target of 50% for 2020. As of 2018, Wales was the only UK nation to meet the target with a recycling rate of 64%. As EU Derivative recycling targets are only likely to rise, businesses need to be able to accommodate for them.

The EU has also targeted a reduction in biodegradable municipal waste (BMW) sent to landfill and wants to improve the recovery rate for non-hazardous construction and demolition waste. The UK generates approximately 27.7 million tonnes of commercial and industrial (C&I) waste and in 2016 generated a total waste amount of 222.9 million tonnes – with England responsible for 85% of the UK total. Landfill tax applies to all waste

disposed of at licensed landfill sites. The fees are charged based on the weight of the rubbish and the category of waste. Meaning that inert or inactive waste (that which isn't chemically or biologically reactive i.e. decomposable) is at a much lower rate than biodegradable or hazardous waste. Each year landfill tax rates have risen and as of April 2020, the lower rate will be £3 per tonne, whereas the standard rate will be at £94.15 per tonne.

Regulations such as these drive innovation in the waste management industry, as well as influencing mergers and acquisitions as business owners are inclined to take a more holistic approach to managing waste. More often companies are partnering to cover more services over a wider geographical space. Government initiatives alongside the adoption of sophisticated technology are due to induce a

European domination of the market share. In addition to waste tracking (as mentioned on page 19), the UK government have issued their support towards helping businesses capitalise on methods that prevent waste going to landfill – in the pursuit towards the zero-waste economy. Despite its name this economy would actually provide more growth for the industry rather than eradicate it, by emphasising the value of resources and increasing capacity for transforming waste into useful products.

An increase in population and urbanisation

Urbanisation around the world has increased due to the densifying populations. This is set to drive the demand, especially in APAC countries. The World Bank has said that the amount of municipal solid waste (MSW) is increasing at an even faster rate than urbanisation. They provide capital investments in order to improve waste sorting and treatment facilities and since 2000 they have contributed more than \$4.7 billion to over 340 solid waste management programmes.



Increase in waste

According to Ends waste and bioenergy, UK landfill sites will be full by 2022. As expected, as the number of people increase, so does the amount of waste. In 2016 the global generation of MSW was 2.01 billion tonnes and according to The World Bank, this will reach an expected 3.4 billion tonnes by 2050. High income countries, which make up 16% of the world's population, generate 34% of the world's waste.

The highest waste per capita usually occurs on islands, which is likely to be caused by tourism.

China makes up for 70% of the APAC regions waste figures, which were recorded in 2013 as 270 million tonnes per year. The East APAC region produces 23% of the world's waste even though it only accounts for 16% of the global population.



Environmental awareness

Over a third of waste in high-income countries is recovered through recycling and composting programmes, however as environmental awareness increases around the globe, gaps are being created for renewable waste management systems.

According to the World Bank's What a Waste 2.0 report, 33% of the world's waste is not managed in an environmentally safe way. Without progression in the industry, emissions

are expected to increase to 2.6 billion tonnes of CO₂ equivalent by 2050.

Plastic waste makes up 90% of ocean debris, and in 2016, the world generated 242 million tonnes of plastic waste. That's the equivalent of 2,400 Olympic stadiums of plastic bottles. According to Forbes, scientists have further predicted that by 2050, if pollution continues at the current rate, there will be more plastic in the ocean than there are fish.

Uncollected waste and dumping

Dumping and untreated waste has increased which directly and indirectly affects public health by leading to infectious disease, driving the demand for waste management. Ultimately a lack of good health has negative effects on economies, and a strong waste management market enables a domino effect of positivity.

Illegal waste dumping is estimated

to come at a cost of £600m to the UK economy each year. Environment Minister Rebecca Pow said that "waste crime causes economic, environmental and social harm in every community it blights". In addition to this, improving waste management will aid cities' resilience in natural disasters, such as flooding, as infrastructure will be in place to respond to anticipated risks.

Valuing Waste Management Companies

There has been a significant amount of M&A activity in the sector in recent years, the largest portion of which falling in the recycling subsector. Determining M&A valuations in the waste management industry varies on a case by case basis. As with all businesses, establishing their worth hinges upon both qualitative and quantitative factors. However, when identifying a company within the waste management industry as a consumer or for investment or an acquisition, there are a few elements worth considering that indicate how good a waste management company is.

Desireable

- **Focus on sustainability** – as a popular trend among both consumers and legislators, compliance with environmentally friendly operations increases the desirability of a waste management business.
- **Updated Assets** – such as a modern fleet of trucks or new machinery in a plant.
- **Recycling capacity** – preventing landfill space being used up makes for a more sustainable company with greater long-term capabilities. This also reduces the outgoing costs that are synonymous with landfill tax fees.
- **Clear Key Performance Indicators (KPIs)** set for the business based on industry standards. These are often targeted based on:
 - % of waste sent to landfill
 - % of waste materials recovered to be recycled or reused
 - Number of routes acquired
 - Length of contracts
- **Strong waste forecasting** – action plans in place to deal with identified waste arisings and waste costs.

Valuation Process

When using a comparable transaction analysis, i.e. comparing a company to similar businesses which have been acquired, there is scope to justify a value based on the amount other companies have been bought for.

Most commonly in M&A transactions within the waste management industry, EBITDA is seen as the best figure with which to begin a valuation. This is due to its representativeness of cash flow – usually over the most recent 12-month

period.

Typically, the valuation of waste management companies has been reaching around 8 to 12 times EBITDA. Arguably, a higher multiple of EBITDA can be rationalised if a waste company has been through a recent period of revenue growth or consistent long-term success. In some niche areas companies have been valued up to 14 times EBITDA.

Key Market Players

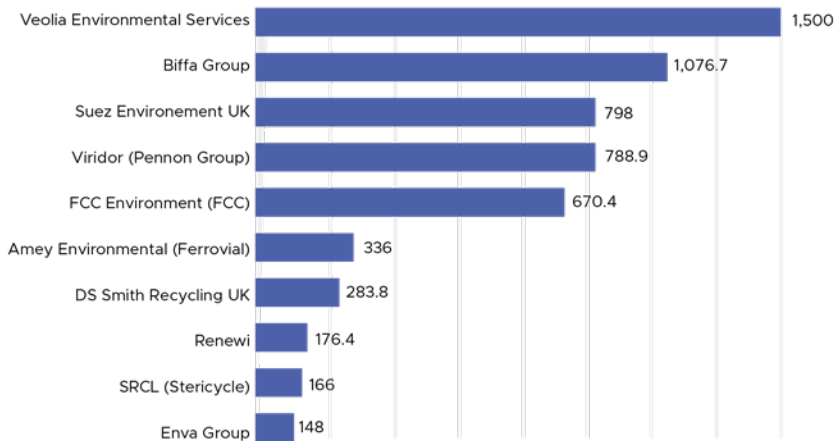
According to Catalyst Corporate Finance, the fastest 50 growing waste and resource management companies in the UK generated average revenues of £22m in 2017. Their growth rate is measured based on turnover, and the average growth rates of new contenders on the list was 18% CAGR.

The combined annual turnover of the fastest growing in 2017 was £1.068bn, with the top ten generating 32% of the total. Businesses have maintained their top performance through investment and expansion. This includes investing in vehicles, disposal capacity and technology alongside

the key growth strategies of forming partnerships, launching new products and acquiring other businesses. The following companies have been identified as key market players, with a snapshot of their recent investment activity in the industry.

Revenues from leading waste management services working in the United Kingdom (UK) in 2017/2018

(In million GBP)



Release date
September 2018

Region
United Kingdom

Survey time period
2018

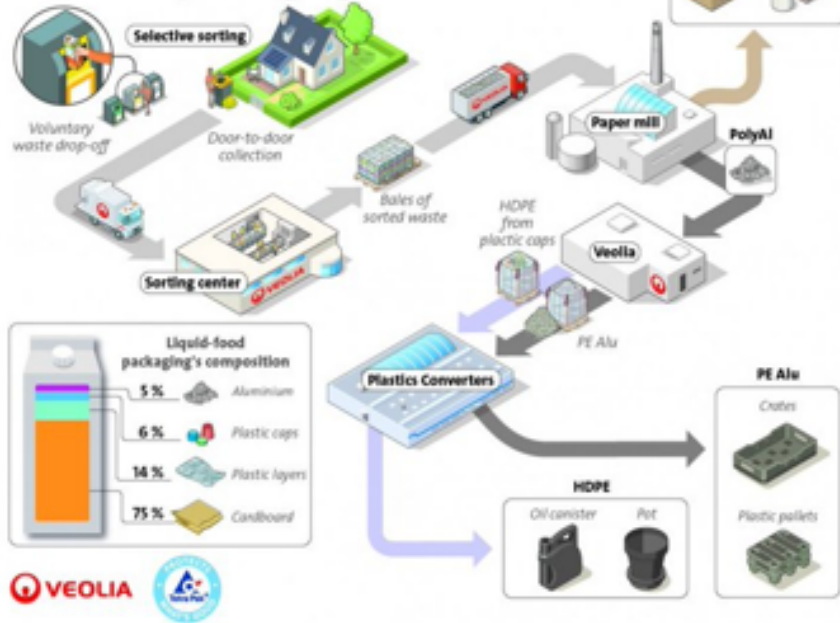


In 2017, they spent around £44m on acquiring 5 businesses enabling a consolidation of different services. The company's investment into expansion has continued, most recently with the opening of a new £27.5m plastic recycling plant in County Durham. It's said to be the most modern of its kind, with capacity to handle 57,000 tonnes of PET plastic per year (1.3bn plastic bottles). The site is

expected to generate revenues of approximately £40m per year. This expansion will improve the waste management giant's already impressive recycling commitments. Already 85% of UK milk bottles contain Biffa recycled plastics.

The company are aiming to continue their trend of growth, with a view to creating an extra 850,000 jobs by 2050.

Recycling process of carton packaging



Veolia have recently become the first company to partner with the Food Waste Reduction Map, the journey to reducing food waste by 50%.

The company are leading the way when it comes to environmentally friendly innovation. They collaborated with Tetra Pak in Nov 2018 to recycle drinks cartons in the EU. Their aim is to utilise the below process to ensure that 100% of carton packages constituents are recycled by 2025. In the UK, the companies net assets are worth over £808m and with investment in innovative plants this value is set to increase.



Suez UK Environment Ltd have recently won a contract worth over £1bn to manage waste for Greater Manchester. They will deal with around 1.1million tonnes of municipal waste across 9 of the county's boroughs.

Their services will also cover mechanical treatment, household recycling and thermal and material recovery, with an aim to redirect 96% of Manchester's waste from landfill to recycling.



Willshees waste & recycling went through a period of high growth in 2017, with a CAGR of 34%.

The company has continued to expand through investment in hard assets- with a fleet now encompassing over 40 vehicles. These comprise of data tracking technology which enables reporting from the point of collection.



Greater Manchester based Kenny Waste have successfully specialised in their area for over 30 years- now turning over £24.6m.

They have been striving for innovation in the recycling subsector by investing in research

into a new product using image recognition in order to automate the labour-intensive steps within the recycling process.

They hope to improve waste management UK wide by increasing accuracy, reliability and traceability in the sector.

The below list of businesses have been identified by Sedulo as some of the industry Ones to Watch. These are waste management companies based in Greater Manchester as well as in the wider North Region.

Company	Division	Year previous revenue (£000)	Latest revenue (£000)	Location	Latest Accounts
Kenny Waste	Commercial and C&D waste	21,110	24,561	Manchester	Mar-19
JWS	Skip hire, Commercial waste & recycling	16,784	16,479	Salford	Oct-18
Willshees	Skip hire, Commercial waste & recycling	14,284	15,875	East Staffordshire	Mar-19
Gaskells Waste Service Ltd	Diverse Waste Management	17,014	17,904	Liverpool	Mar-19
A1 Services	Muck away, vehicle hire, C&I waste management			Bolton	
Cumbria Waste Group	Diverse across the NW	15,265	19,905	Carlisle	Mar-19
Recycling Lives	Diverse including WEEE and total waste management	42,804	66,096	Preston	Sep-18
J Dickinson & Sons	Skip Hire, Recycling, Waste Management			Bolton	
Mick George	C&D and recycling	131,363	158,301	Huntingdon	May-18
B&M	Total Waste management solutions	35,012	38,343	The Wirral	Jun-18
Wheeldon Brothers	Skip hire, SRF processor	10,899	11,689	Bury	Jul-18
LSS Waste	Skip hire, recycling	12,182	15,121	Leeds	Mar-19

Mergers and Acquisitions



JBT were acquired by global recycling giants Remondis in November 2016.



Pandagreen, Ireland based Waste management business acquired Widnes based WSR Recycling.



SAR Recycling, a battery recycling specialist with a customer base across the UK and Ireland has been acquired by Enva, resource recovery specialist.



Shanks merged with Van Gansewinkel for £479 million. Renewi PLC is the new entity under which they are operating.



B&M waste services acquired One Stop Managed Waste, AWS Recycling's trade waste division and more recently Ian Wilcox Recycling.

B&M are based out of the Wirral and are known for being a family run company with a strong customer and CSR focus.

Chesterfield based One Stop Managed Waste offer waste handling equipment, waste collection, service and repair, WEEE recycling, revenue from waste.



AWS is a West Midlands based company. Following the acquisition of its trade waste division, the company can now focus on its core functions of RoRo and skip collections.



The Ian Wilcox deal strengthens B&M's reach across the west Midlands. The company can now offer carbon neutral waste management whilst expanding their services to handle a wider range of discarded materials.

**Ian Wilcox
Recycling**

What Have We Done In The Industry?


 The logo for WasteSure features a large, stylized 'W' in white and green, followed by the word 'ASTESURE' in white and green capital letters, all set against a solid orange background.

WasteSure is a national waste management firm that is based out of Bury, Greater Manchester. The company offers a range of services including waste logistics, storage, segregation and handling specialist and hazardous waste. They achieved £2m turnover inside just one year of trading.

Sedulo funding solutions helped MD, Mark Dunne, to pitch and fundraise to start WasteSure as his own business. WasteSure also has access to a range of other services helping to nurture the business in order to continue and develop its success.

Sedulo Innovation partnered with WasteSure and supported the successful realisation of its R&D Tax Relief claim following the

development of their industry-first waste management software platform. This partnership supported company decision-makers to advance their technology while meeting the requirements of the R&D legislation. This helped to facilitate the development of their sophisticated software platform, which is capable of tracking, analysing, and evaluating various critical metrics associated with the respective waste disposal options. This software further expands the capacity for autonomous collaboration amongst disparate third-party systems. What is more, these advancements have the capacity to positively contribute to wider, industry and economic waste reduction goals including the reduction of carbon outputs, and the reliance placed upon landfill resources.



For a number of years, Sedulo have worked with ROYDON. The Swinton, Greater Manchester, based group consist of multiple trading companies which specialise in plastics recycling. A couple of years ago, Sedulo Corporate Finance facilitated a management buyout (MBO) for the company.

The MBO saw founders depart from the business, enabling management shareholders to take full ownership of Roydon. Sedulo Corporate Finance Partner, Benn Longshaw, said that after acting as the company's accountant for a number of years, "Being then able to facilitate a transaction that sees the founding shareholders rewarded for their hard work over the years, and the existing management able to benefit further from future performance is a fantastic result."

Waste Management Services

Waste to product

Waste to product one of the most exciting and innovative areas within the waste management industry. There is a huge range of products created from material that was previously no longer of use. Some of the most fascinating products include:

- **Nappy roofing** – even though it sounds gruesome, disposed nappies and sanitary products are used to create roofing tiles. Specialist plants separate the polymers from the organic waste which are then used to make fibre-based construction materials.
- **Football Shirts** – in 2013 Brazil debuted their new kits made from an average of 13 recycled bottles.
- **Eco-Bricks**. These are an amazing use of plastics which can't be recycled. They are made by filling plastic bottles with clean un-recyclable plastics, usually cellophane bags until the bottles are full. These are used in several communities especially in developing countries in order to build staircases, tables, chairs and more. Because the plastic inside the bricks can't break down, it makes it an ideal building material.
- **Bottle Bricks** – this is a slightly different waste to product journey, as it involves designing consumer products in a way that they can be used as a construction material after use. This initiative was introduced by the owner of Heineken in the 60s. After visiting a developing community with a lack of shelter, he designed a brick-shaped, interlocking bottle that could be used to build.
- **Plasphalt** – used in road resurfacing, plasphalt is made up of plastic waste instead of the usual sand and gravel in asphalt.

Energy from Waste

The Energy from Waste (EfW) process usually uses combustion in order to directly generate energy in the form of heat or electricity, or by enabling the production of combustible fuels. This process helps to avoid the CO₂ emissions released from fossil-fuel based energy generation and eradicates the potential of methane emissions as associated with landfill.

Due to their complexity, cost-wise – EfW plants are an expensive construction. Plants can gain an extra fee for charging for the waste they accept, this combined with the sale of their energy production enables an economical business. The global EfW market is expected to be worth \$35.5 billion by 2024, with thermal technology dominating the market. Europe's EfW is projected to surpass \$2.5bn by 2024.

Clinical waste

There is currently a gap in the market for sufficient clinical waste management, as it is reported that there is a lack of incineration capacity in the UK. Due to the high-risk nature of clinical waste, regulations are meticulous and higher temperature incineration is required to deal with infectious and hazardous materials.

Muck away

Covers the removal of inert waste, that which isn't biologically or chemically reactive such as concrete, usually from a building site clearance project, which is then sent to an inert tipping site. The service can also cater to contaminated inert waste such as material containing asbestos. Muck away service providers can face high tax rates, especially for loads of hazardous waste. However, there is money to be made in the industry through franchising – a powerful strategy with proven success in companies such as Mick George, currently turning over above £158.3m.

Composting/ Anaerobic Digestion

Food waste

Research by the United Nations Food and Agriculture Organisation has found that a third of food made for human consumption is dumped each year. Decomposing food is responsible for a large portion of greenhouse gas emissions, with the methane from vegetables having a warming potential 25 times higher than carbon dioxide.

Food waste management provides alternative routes for the destiny of food, with the ability to turn waste into fertilizer, produce new materials, create cosmetics and generate energy. Unbelievably, pineapple and fish skins are composed of fibres capable of being reconstructed into leather and egg shells can be used in rubber tire strengthening. Over \$780 billion is lost each year in by food going to waste – approximately the same amount of money it would take to feed the estimated 8 million hungry people.

The compost market bridging the gap between consumers and organic fertilisation and is therefore growing, as people are looking for alternatives to chemical fertilizers. In 2011, the UK composting market turned over above £165m, and by 2024, the global compost market is projected to reach \$9.2bn.

When undergone in the presence of oxygen, the process of organic matter breaking down is known as composting, whereas when matter is decomposed without air, it is known as anaerobic digestion. The latter method produces biogas, a source of renewable fuel and fertiliser. Today, the global anaerobic digester market is valued at around \$107m and it is expected to achieve a worth of \$150.5m by 2026.

Weee

WEEE covers the management of Waste Electrical and electronic equipment.

In 2019 240.5k tonnes of household WEEE was collected from designated collection facilities and the total of household WEEE including that returned under different regulations was just under 377k tonnes.

Recycling

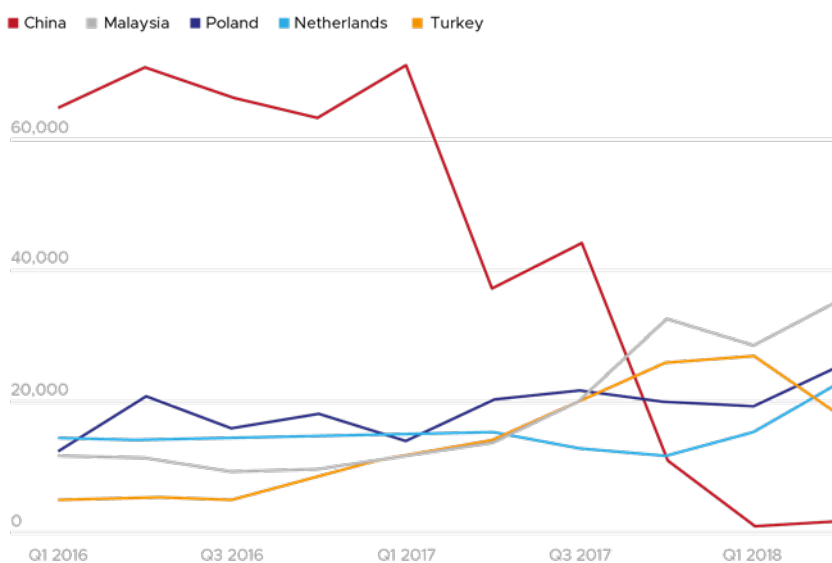
Recycling is the largest waste management subsector and essentially reverts products back to their raw material before constructing a new product. Items have the potential to be down-cycled, i.e. made into a cheaper/weaker but still useful product, or up-cycled and made into something more valuable.

Chinas ban on importing recyclables has driven the development of the recycling sector in domestic markets. The UK industry has previously been investigated by the Environment Agency as it was suspected that recycling waste sent for export was contaminated. In addition to this, recycling has been left to infiltrate waterways and shipments are being rerouted to illegal destinations, resulting in several agencies having their licences revoked.

The export industry is worth over £50m, and with high rates, people are keen to pursue the market. In the UK alone, the recycling industry was worth £23.3bn in 2012 – the global market has been projected to reach \$377bn by 2024.

UK plastic exports to other countries have risen since China banned imports this year

Tonnes



Guardian graphic | Source: National Packaging Waste Database, Environment Agency

Political landscape

The Winter of Discontent in 1978/79 was symbolised by the sights of piles of rubbish filling the streets of the UK. Following years of inflation from successive governments, resulting in public sector pay cuts, trade unions entered disputes with politicians and influenced public sector strikes. British dustmen were one of the group of workers with the capacity to have a significant impact on British society, so when they went on strike, mounds of household and commercial waste built up. Famously glamorous areas of London were unrecognisable in their landfill like state, and their generation of discontent provoked an election in the UK and thus the beginning of Margaret Thatcher's prime ministership.

As a consequence of this change, municipal waste management became denationalised and contracts began being sold off to private companies. Ever since the market has been

increasingly active and with free reign, Merger and acquisition activity has been able to flourish.

By privatising the industry, the UK government have made it more difficult for themselves to enforce regulations in line with environmental policy objectives. This is due to a lack of centralised organisation and co-ordination of services- making it harder to collaborate on large scale operations. However, regulation and legislation, largely set at European level, have undoubtedly shaped the industry, and centralised bodies such as CIWM (Chartered Institute for Waste Management) have made it easier for waste management companies to work towards unified goals.

As negotiations regarding the nature of the relationship between Britain and the EU ensue following Brexit, there is speculation around whether the UK

will maintain adherence to directives set by the EU. It has been suggested that recycling sector might change to targeting materials based on their value and environmental impact rather than weight.

On 30th January 2020, parliament introduced a new environment bill which sets out a framework for objectives in four key areas – air quality, nature, resources and waste, and water – all areas with strong links to the industry. Among the list of plans includes the establishment of deposit return schemes, improvement of collection of materials from households and businesses, further measures on waste crime, and effective law enforcement against littering. These areas will be identified as paths for growth in the waste management industry and further regulation to drive the market.



Illegal Waste Trafficking

Although there is a lot of legislation in place to ensure that waste is dealt with safely, organised crime groups frequently see the costs associated with the industry as an opportunity to infiltrate the market. Disused factories have been used to illegally store reactive waste including combustibles and decomposable items, which have then been intentionally set alight.

It is estimated that illegal profits from each waste trafficking operation can total between £400k and £500k. Not only does this distract income away from the market but also puts other victims at a loss. Owners of buildings can be unaware of the activity occurring inside them and face paying out for repairs. Local people face exposure

to pollutants from burned waste and sources of water can also become contaminated, thus affecting the wider population. In addition to this, leftover waste creates the problem of needing to be shifted to the correct facilities – the cost of solutions for which will be billed to the local taxpayers or private landowners.



The Future Of Waste Management

Rubbish tracking technology

At the back end of 2019, the UK government announced plans to invest £1m of grant funding into the waste-tracking tech industry. The two companies that have secured the investment are Anthesis, an environmental consultancy and Topolytics, a waste analytics company.

The companies have been selected to develop prototypes of technology that digitally track waste in order to advance the largely paper-based system that is currently in place to record the movements of household and commercial waste.

The funding comes as part of an initiative to intercept waste crime including the illegal shipment of waste overseas. The technology is expected to use QR codes on mobile devices to identify batches of rubbish or use apps and sensors on waste containers and vehicles. Digital record keeping

will combat the exploitation of waste labelling by organised criminals who avoid paying landfill tax or illegally export it.

At Lyon train station in France, Blockchain technology is already being trialled in order to collate detailed information on quantities of waste, who has collected it and in which ways it is being transported. According to The Conversation, in a one-month pilot, this saved the station nearly €2,000 by improving the efficiency in waste management for five different types of rubbish.

Blockchain can be used to extend the accountability for waste to producers, by storing all transactions in a block from inception. If a product ends up being a piece of litter on a beach, ultimately governments will be able to identify each step along the trail of responsibility.

On-street recycling

Currently, recycling at home is much easier than in public, but this is set to improve.

Already more fast food shops and councils on some high streets are providing recycling bins.

Edinburgh introduced high street recycling for the first time in 2019, catering for cans, plastic bottles and coffee cups.

It's likely that other cities will follow suit making on-the-go recycling much more accessible.

Energy efficient bin lorries

In January this year Cambridge city councillors have announced they are prepared to spend £375,000 on an electric bin lorry with the aim of accelerating their fight against climate change and improving local air quality.

Although they are over double the cost of their current lorries – It's likely that the change will also decrease running costs, as currently, their fleet of 50 wagons and 18 street sweepers require £46,000 in fuel per month.

In a further attempt to lower emissions, councils have also begun an upcycling scheme, in order to adapt and utilise end-of-life bin lorries. Previously diesel-fuelled vehicles are being fitted with electric motors and the scheme even enables lorries to become self-sufficient, in the sense that the electricity used to charge their batteries can be generated from burning the waste that they collect.

The scheme is worth £1.7m, provided by government public funding body Innovate UK. The refresh increases the lorries' life span, which is usually only 7 years long before being scrapped, by double.

Circular economy

The waste management industry can create the foundations upon which the journey towards a circular economy can be reinforced. Essentially this is an economy which reduces disposals and normalises repeated utilisation of resources- ensuring that pinnacle of a product's value is gleaned from it.

Leading the way for this progressive future, waste management CEOs have announced their support for improving strategy. Step towards this includes eliminating non-recyclable packaging, investing in the building of around 200 new recycling plants in order to meet targets and policy to lengthen the terms of contracts so that the industry has a safety blanket against which to invest. According to politics home, the industry is prepared to invest £10m over the next ten years – creating thousands of jobs, saving millions of tonnes of emissions and generating a lot more energy.



BIBLIOGRAPHY

- Allied Market Research. 2019. Waste Management Market by Waste Type (Municipal Waste, Industrial Waste, and Hazardous Waste) and Service (Collection and Disposal): Global Opportunity Analysis and Industry Forecast, 2018–2025. <https://www.alliedmarketresearch.com/waste-management-market>
- AMS. 2020. What is Muck Away? <https://www.avonmaterialsupplies.co.uk/AMS/index.php/what-is-muck-away/>
- Andusia. 2019. The clinical waste market. <https://www.andusia.co.uk/blog/2019/08/29/the-clinical-waste-market/>
- BBC. 2019. Upcycled bin lorries to be tested in London and Sheffield. <https://www.bbc.co.uk/news/uk-england-london-49594943>
- BBC. 2020. Cambridgeshire electric bin lorry 'better for climate change'. <https://www.bbc.co.uk/news/uk-england-cambridgeshire-51197080>
- Breeze, P. 2018. The Economics of Energy From Waste. <https://www.sciencedirect.com/science/article/pii/B9780081010426000091>
- Business Green. 2019. Waste crime: Smart rubbish-tracking tech given £1m government boost. <https://www.businessgreen.com/bg/news/3082903/waste-crime-smart-rubbish-tracking-tech-given-gbp1m-government-boost>
- Business Growth Hub. Undated. Innovative vision to revolutionise recycling globally. <https://www.businessgrowthhub.com/innovation/resources/case-studies/kenny-waste-management>
- Business Growth Hub. 2017. Market intelligence for the waste management industry. <https://www.businessgrowthhub.com/green-technologies-and-services/resources/blogs/2017/10/market-intelligence-for-the-waste-management-industry>
- Business Insider. 2013. Before Thatcher Came To Power, The UK Was Literally Covered In Gigantic Piles Of Garbage. <https://www.businessinsider.com/thatcher-and-the-winter-of-discontent-2013-4?r=US&IR=T>
- CambridgeshireLive. 2017. How to make a lot more money with your tipper truck. <https://www.cambridge-news.co.uk/business/how-make-lot-more-money-12539576>
- Circular. 2017. The Fast 50. <https://www.circularonline.co.uk/opinions/the-fast-50/>
- Circular. 2019. SUEZ wins Greater Manchester waste contract. <https://www.circularonline.co.uk/news/suez-awarded-greater-manchester-waste-contract/>
- Circular. 2020. Biffa opens £27.5m plastic recycling plant and announces a new £7m facility. <https://www.circularonline.co.uk/news/biffa-opens-27-5m-plastic-recycling-plant-and-announces-a-new-7m-facility/>

- Circular. 2020. Veolia becomes first recycling company to join the UK Food Waste Reduction Roadmap. <https://www.circularonline.co.uk/news/veolia-becomes-first-recycling-company-to-join-the-uk-food-waste-reduction-roadmap/>
- Cision PR Newswire. 2019. Global Compost Market Report 2019: \$9.2 Billion Market Opportunities, Trends, Forecast and Competitive Analysis, 2013-2024. <https://www.prnewswire.com/news-releases/global-compost-market-report-2019-9-2-billion-market-opportunities-trends-forecast-and-competitive-analysis-2013-2024--300931284.html>
- CityMetric. 2015. 9 building materials made entirely from waste products. <https://www.citymetric.com/skylines/9-building-materials-made-entirely-waste-products-932>
- CIWM. 2020. Today's Environment Bill is welcome first step but could be improved, says CIWM. https://www.ciwm.co.uk/ciwm/news/2019/environment_bill_is_welcome_first_step.aspx
- Davies, S. 2007. Politics and Markets: the case of UK Municipal Waste Management. <https://orca.cf.ac.uk/78168/1/wrkgpaper-95.pdf>
- Department for Environment Food and Rural Affairs. 2013. Forecasting 2020 Waste Arisings and Treatment Capacity. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/251567/pb13883-forecasting-2020-waste-arisings-131017.pdf
- Department for Environment Food and Rural Affairs. 2013. Waste Management Plan for England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/265810/pb14100-waste-management-plan-20131213.pdf
- Department for Environment Food and Rural Affairs. 2015. 2010 to 2015 government policy: waste and recycling. <https://www.gov.uk/government/publications/2010-to-2015-government-policy-waste-and-recycling/2010-to-2015-government-policy-waste-and-recycling>
- Department for Environment Food and Rural Affairs. 2019. UK Statistics on Waste. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784263/UK_Statistics_on_Waste_statistical_notice_March_2019_rev_FINAL.pdf
- Digital Journal. 2020. Anaerobic Digester Market Anticipated to Reach US\$150.5 mn by 2026 as Awareness of Eco-friendly Waste Disposal- QY Research, Inc. <http://www.digitaljournal.com/pr/4576237>
- Due Dil. 2020. Veolia UK Ltd. <https://www.duedil.com/company/gb/02664833/veolia-uk-limited>
- ENDS waste & bioenergy. 2018. UK landfill sites 'will be full' by 2022. <https://www.endswasteandbioenergy.com/article/1496481/uk-landfill-sites-will-full-2022>
- Energy Live News. 2019. On-street recycling launches for the first time in Edinburgh. <https://www.energylivenews.com/2019/10/23/on-street-recycling-launches-for-the-first-time-in-edinburgh/>
- Finbox. 2020. Financial Model Templates for Waste Management. <https://finbox.com/NYSE:WM/models/ebitda-multiples>
- Forbes. 2018. These Five Companies Are Leading The Charge On Recycling. <https://www.forbes.com/sites/justcapital/2018/04/20/these-5-companies-are-leading-the-charge-on-recycling/#4d19405623ec>
- Global Ecobrick Alliance. Undated. <https://www.ecobricks.org/build>
- Grant Thornton. 2018. A record year for waste M&A. <https://www.grantthornton.co.uk/insights/a-record-year-for-waste-ma/>

HMRC. 2020. Landfill Tax Rates. <https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013>

Huffington Post. 2017. Food waste - a tremendous economic waste. https://www.huffpost.com/entry/food-waste-a-tremendous-economic-waste_b_5943ca03e4b024b7e0df4afb?guccounter=1&guce_referrer=aHR0cHM6Ly-93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAADL9xJVj8yo3m7aWSa-W919xVOwbEaqt3fM1paF9wlsNyFcvl0xS4xWrqZljB2hgAZ9Oqzj_QavwAsSIHt-jyBOR6VfUzz8s6XCOKaukth5H1UAOPrD9xR-kaLNqWID9Vb_yRPHunxpgOE8xY-exZVtLJ6PuWmrKHUQ7yUuvwkiQiBf

Insider Media Ltd. 2020. West Midlands Expansion for B&M Waste Services. <https://www.insidermedia.com/news/north-west/west-midlands-expansion-for-bm-waste-services>

Insider Media Ltd. 2020. Enva snaps up battery recycling specialist. <https://www.insidermedia.com/news/yorkshire/enva-snaps-up-battery-recycling-specialist>

Kenny Waste Management. 2018. <https://www.kennywastemanagement.co.uk/about-us/>

Letsrecycle.com. 2015. Waste sector creates £6.8bn for UK, Defra claims. <https://www.letsrecycle.com/news/latest-news/waste-sector-creates-6-8bn-uk-defra-claims/>

Letsrecycle.com. 2019. B&M acquires AWS Recycling's trade waste division. <https://www.letsrecycle.com/news/latest-news/bm-acquires-aws-recyclings-trade-waste-division/>

MarketWatch. 2019. Waste to Energy (WTE) Market size| An in-depth analysis with revenue report of USD 35.5 billion by 2024. <https://www.marketwatch.com/press-release/waste-to-energy-wte-market-size-an-in-depth-analysis-with-revenue-report-of-usd-355-billion-by-2024-2019-09-25>

MRW. 2012. Recycling Industry now worth £23bn in UK. <https://www.mrw.co.uk/recycling-industry-now-worth-23bn-in-uk/8625475.article>

Politics Home. 2019. Waste management industry & Government can build the solid foundations needed to make the circular economy a reality in the UK. <https://www.politicshome.com/news/uk/economy/food-and-drink/opinion/environmental-services-association/105546/waste-management>

Recycling & Waste World. 2018. How legislation and targets are driving technology in the waste management industry. <http://www.recyclingwasteworld.co.uk/in-depth-article/how-legislation-and-targets-is-driving-technology-in-the-waste-management-industry/167297/>

Resource. 2019. UK Recycling rate increases to 45.7 per cent. <https://resource.co/article/uk-recycling-rate-increases-457-cent-13090>

Roby, E. Undated. Sociological Approaches to Waste as a Social Problem: Environmental Burden, Race, Class, Place. https://www.academia.edu/8520721/Sociological_Approaches_to_Waste_as_a_Social_Problem_Environmental_Burden_Race_Class_and_Place

Sedulo. 2019. Sedulo Times – Q4 2019. https://issuu.com/sedulo/docs/sedulo-times_q4_2019_edition17_print_compressed__1_

Statista. 2019. Global market value of waste recycling 2017 – 2024. <https://www.statista.com/statistics/239662/size-of-the-global-recycling-market/>

Statista. 2020. Household Rates of Recycling in England 2000-2019. <https://www.statista.com/statistics/444744/household-recycling-rate-uk/>

- Statista. 2020. Revenues from leading waste management services working in the United Kingdom (UK) in 2017/2018. <https://www.statista.com/statistics/298437/revenues-of-leading-uk-waste-management-services/>
- The Conversation. 2017. Waste Crime: the multi-million pound swindle. <https://theconversation.com/waste-crime-the-multi-million-pound-swindle-33622>
- The Conversation. 2018. A rubbish idea: how blockchains could tackle the world's waste problem. <https://theconversation.com/a-rubbish-idea-how-blockchains-could-tackle-the-worlds-waste-problem-94457>
- The Guardian. 2013. Turning waste into worth – innovation in pictures. <https://www.theguardian.com/sustainable-business/gallery/waste-to-worth-innovation-in-pictures>
- The Guardian. 2018. UK Plastics recycling industry under investigation for fraud and corruption. <https://www.theguardian.com/environment/2018/oct/18/uk-recycling-industry-under-investigation-for-and-corruption>
- T.Michael. 2013. Environmental and social impacts of waste to energy (WTE) conversion plants. <https://www.sciencedirect.com/science/article/pii/B9780857090119500028>
- The World Bank. 2018. What a Waste: an Updated Look into the Future of Solid Waste Management. <https://www.worldbank.org/en/news/immersive-story/2018/09/20/what-a-waste-an-updated-look-into-the-future-of-solid-waste-management>
- The World Bank. 2019. Solid Waste Management. <https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management>
- WIH Resource Group. 2018. M&A Valuations for Solid Waste & Recycling Businesses. <https://wihresourcegroup.wordpress.com/2018/06/14/ma-valuations-for-solid-waste-recycling-businesses/>
- Willshee's. 2019. Fleet Investment is Key to Success. <https://www.willshees.co.uk/news/fleet-investment-is-key-to-success/>
- Worldometer. 2020. Current World Population. <https://www.worldometers.info/world-population/>
- Wrap. 2011. UK composting industry is booming. <http://www.wrap.org.uk/content/uk-composting-industry-booming>
- Wrap. Undated. Delivering good practice Waste Management. <http://www.wrap.org.uk/sites/files/wrap/Waste%20man%20technical1.pdf>