

Joint Waste Committee

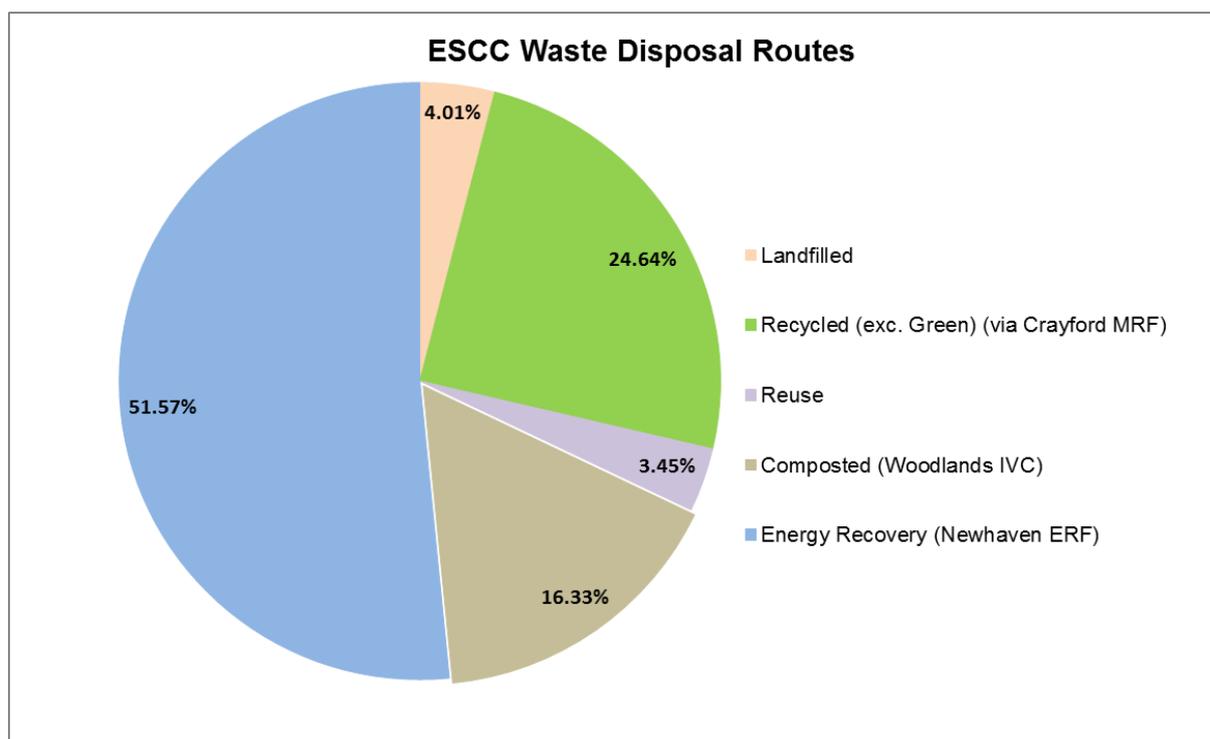
Date - 27 September 2019
Report of the - Lead Director, Dr Anthony Leonard
Subject - Recycling Materials – Volume, Composition, Contamination and End Destinations

Recommendation: It be **RESOLVED:** That the report be noted.

Report Author: Justin Foster, Waste Team Manager, East Sussex County Council

Introduction: Recycling Materials: Volume, Composition, Contamination and End Destinations

1. East Sussex County Council (ESCC) is responsible for the disposal, recovery and recycling of 254,000 tonnes of domestic waste each year. Most of this is collected by the five District and Borough Councils across East Sussex and about a quarter is brought by residents to our 10 Household Waste Recycling Sites (HWRS).
2. Of this 254,000 tonnes, approximately 25% is recycled, 16% is composted and 52% is sent for energy recovery. Just over 3% is reused whilst around 4% is sent to landfill. The chart below illustrates this. East Sussex is one of the most successful disposal authorities in the country at minimising waste to landfill.



Kerbside Recycling

3. All Councils in East Sussex now collect from residents the same mix of recycling materials in the same way. For the next three years under a new recycling disposal contract, Viridor will recycle ESCC's kerbside mixed recycling (around 50,000 tonnes per year).
4. Viridor are part of the Pennon group who are one of the largest environmental infrastructure groups in the UK. They have assets of around £6.5 billion and a workforce of around 5,000 people. Viridor provide waste services to over 150 local authorities and large corporate clients, as well as over 32,000 customers across the UK.
5. Under the new recycling contract which began on 29 June 2019, paper, cardboard, plastic bottles, pots, tubs and trays, aluminium cans, steel cans and glass from all five authorities are delivered to Viridor's Crayford Materials Recycling Facility (MRF).
6. The materials are then sorted and processed into high-quality commodities and sold to recycling markets.

The Waste Disposal Contract and Household Waste Recycling Sites

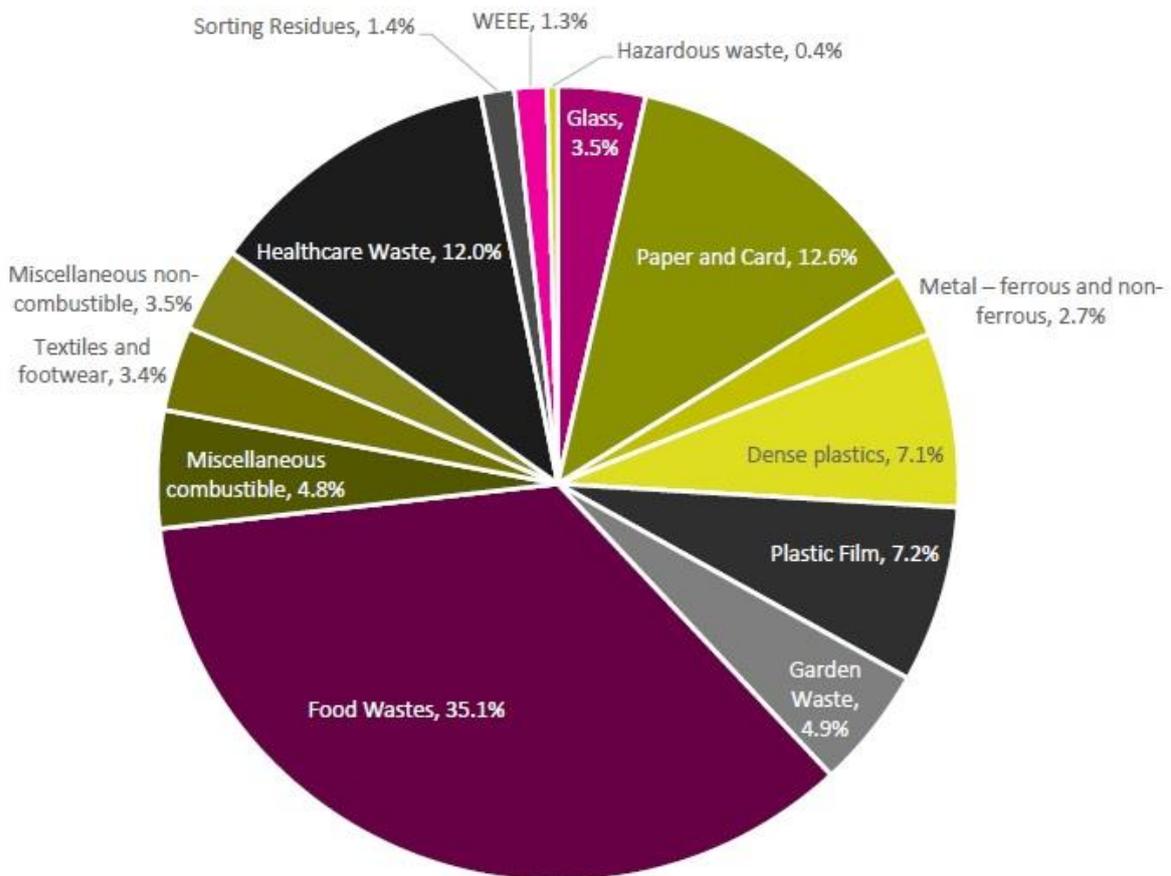
7. Veolia South Downs Ltd has delivered and operates the Integrated Waste Management Service Contract awarded in April 2003 by ESCC and Brighton & Hove City Council. This contract runs until March 2033.
8. The contract has provided East Sussex with a number of facilities which are all built by and operated for us by Veolia, including the Newhaven Energy Recovery Facility (ERF), Woodlands In-Vessel Composting Facility and Hollingdean Materials Recovery Facility. All of these facilities enable us to recover value from our waste and recycling locally.
9. Veolia also operate our network of HWRSs. Recycling from the County's 10 HWRSs is transported to processors direct or delivered to our Waste Transfer Stations (WTS) where it can either be taken to the Hollingdean MRF or bulked and transported for processing at other facilities.
10. Veolia UK is part of a worldwide group of companies, with over 163,000 employees worldwide. This group of companies design and provide water, waste and energy management services.

Residual Waste Composition

11. In May 2017, Resource Futures¹ conducted a composition study of kerbside residual waste on behalf of the East Sussex Joint Waste Partnership and Lewes District Council. The analysis included 891 households from across the Eastbourne Borough Council, Hastings Borough Council, Rother District Council, Wealden District Council and Lewes District Council areas.

¹ Resource Futures, Waste Compositional Analysis: East Sussex Waste Partnership

12. The pie chart below illustrates the composition of our residual waste (around 8.06 kg / household / week).

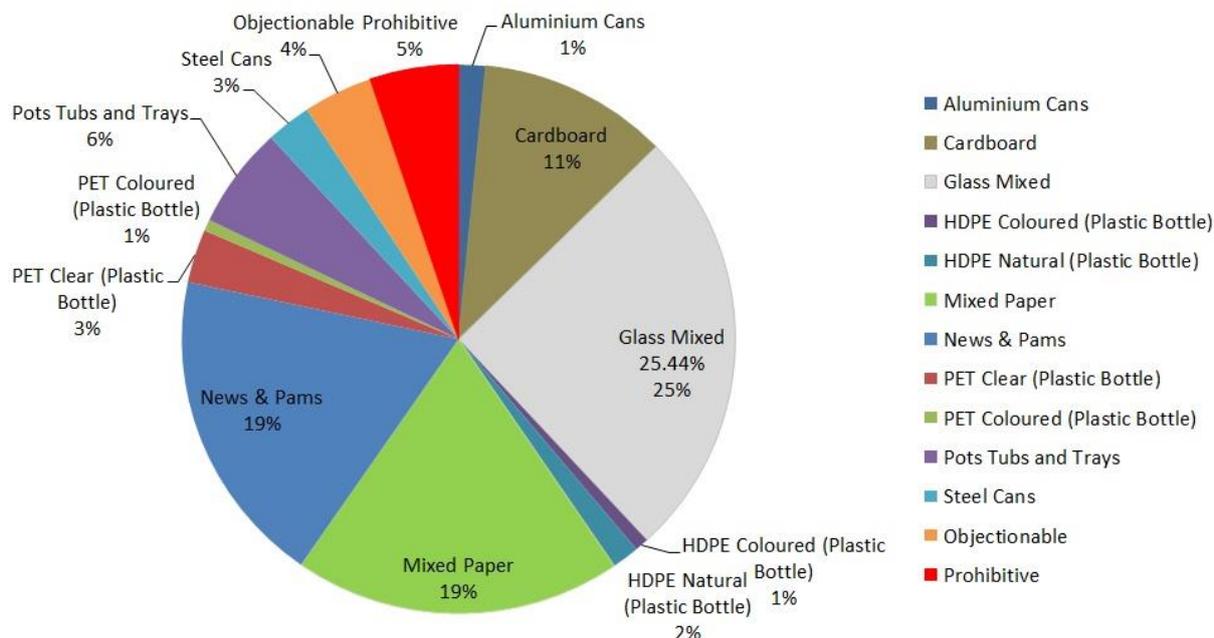


13. Food waste is by far the largest category within the residual stream making up 35.1% of the composition with 24.2% being avoidable food waste (food thrown away that could have been eaten). The Government’s ‘Resources and Waste Strategy for England’² may help to shape future waste services and the possible introduction of changes such as mandatory, funded separate food waste collection may be one of the outcomes of this strategy.

Recycling Composition

14. Continuous sampling of materials sent to the Crayford MRF (via the Viridor contract) means that we can understand the composition of our recycling. The chart below provides an example of material from Hastings and Rother delivered into the Pebsham Transfer station in July 2019.

² <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england>



15. This illustrates that during this July sampling, just under 91% of material collected and delivered into Pebsham comprised target material.
16. Just over 4% of material was classified as 'objectionable' which includes materials that are more tricky to separate and recycle. This includes hard plastics, plastic bags, plastic film and scrap metals.
17. A total of just over 5% was classified as 'Prohibitive' material i.e. contamination including items like black bag waste, food, textiles, batteries, nappies and cartons.
18. Below shows analysis of the top three types of contamination received in July from across the five Waste Collection Authorities.

| Top 3 contaminants % of DMR sample | | EBC | HBC & RDC (both tipped at Pebsham) | LDC | WDC |
|------------------------------------|----|----------------|------------------------------------|---------------------------|---------------------------|
| July 2019 | 1. | Textiles 1.67% | Food 0.90% | Food 1.44% | Food 2.22% |
| | 2. | Food 1.14% | Textiles 0.86% | Black plastic sacks 0.81% | Black plastic sacks 1.69% |
| | 3. | Cartons 0.62% | Sanitary/nappies 0.66% | Textiles 0.47% | Textiles 1.52% |

Recycling Quality

19. With increasingly stringent quality standards being imposed by reprocessors around the world, the material collected for recycling needs to be clean and good quality which means being free of contamination. In East Sussex, the Waste Collection Authorities have adopted the 'fully comingled' approach for the collection of kerbside recycling. This method of collection was identified

as offering best-value to the tax payer. East Sussex generally produces good quality recycle (very good in Lewes), but it is commonly accepted that this method of collection does not usually produce the quality that can be achieved via twin-stream (i.e. typically paper or glass collected separately) or fully source separated collection methods. These methods however, usually involve higher collection costs and can potentially yield less tonnage.

20. Once contamination occurs, the risk increases of material being rejected during the recycling process or by the end market and sent for energy recovery or disposal. MRFs cannot 'cure' poor quality recycling – they simply sort material into their different streams and rely on incoming material that is clean, dry and loose.
21. Contamination most widely occurs with residents and other members of the public placing incorrect items either into their kerbside bins, on-street recycling bins or the incorrect container at HWRS. In sufficient quantities this can cause entire loads to be rejected either at the kerbside, WTS or at the MRF.
22. Recycling collection crews should be giving each wheeled bin a visual inspection which can stop contaminated wheeled bins even making it as far as the collection vehicle although such inspections can only identify items which are immediately obvious. Once collected, further visual inspections of delivered loads take place at the WTS / MRF and rejected loads are reported back to ESCC and then to District and Boroughs Councils. In addition to significant cost implications for ESCC, this results in our residents' material not being recycled.
23. Occasionally, collection issues may result in loads of recycling being mixed with residual waste. This practice can render entire collected Refuse Collection Vehicle loads as contaminated or, worse still, entire bulked articulated loads arriving at Crayford MRF if this contamination has not been spotted at a WTS.
24. Fortunately, local authorities can, to a large extent, influence residents' kerbside behaviour by providing regular and simple to understand information about what they should and should not put into the recycling bin.
25. These communications, along with effective procedures to ensure collections are carried out properly, coupled with inspecting and monitoring of loads from kerbside to MRF, enable collection and disposal authorities to ensure as little material gets rejected as possible.

Cartons

26. The group of materials generically known as 'cartons' were first developed by the Swedish company Tetra Pak, as an alternative to using glass containers for milk. Today, Tetra Pak is one of the largest food packaging companies in the world.
27. Cartons are popular because they have a low packaging to product ratio and allow processed foods to keep for longer. However, once they have been used, they present a challenge when they enter the waste stream.

28. In general, Cartons are comprised of six layers of material (including two types of plastic)³ which need to be separated. The paperboard fibres are recycled into pulp and used to make household products such as paper towels and toilet paper but usually the remaining plastic and aluminium compound residue - called PolyAl – is often incinerated at ERFs. Virtually all types of composite material are challenging to recycle. Other examples of challenging composites are toothpaste tubes and post-it notes.
29. Cartons are a very small waste stream. In East Sussex, they form 0.2% of the overall waste stream (around 508 tonnes) which is the same as reported in a 2017 Waste and Resources Action Programme study of carton volumes in the national waste stream⁴.
30. Viridor's Crayford MRF, like many other MRFs in the UK, does not have mechanical methods available to separate cartons. Therefore, if cartons are delivered with the mixed recycling they will end up contaminating the paper and cardboard recycling streams which could result in materials being rejected by end markets.
31. With the recycling reprocessing industry tightening its quality standards, we need to reduce the level of contamination to help produce higher quality recycling materials. Cartons are a separate material stream to paper and cardboard and need to be treated as such. So we are asking residents not to put cartons into their mixed recycling collection.
32. Currently, ESCC are working with Veolia to consider if dedicated recycling containers can be provided cost effectively at HWRS.
33. ACE UK (located in Yorkshire) who represent Tetra Pak, Elopak and SIG Combibloc offer recycling opportunities for tetrapak but initial costings indicate this would not be cost neutral, so further analysis of the available options and carbon implications for collection, haulage and processing is required.
34. The Government's '*Resource and Waste Strategy for England*'⁵ includes an overhaul of the 'Producer Responsibility' system whereby companies placing material on the market are required to pay for the cost of then dealing with that material within the waste stream. Material could be assigned modulated fees which would mean more challenging materials to recycle could face much higher fees. The effect of this could be to shift production to other materials for which better recycling solutions exist. Further consultation on this is expected in early 2020 with implementation proposed for 2023.

End Destinations

35. A common question raised by members of the public who participate in kerbside recycling schemes provided by local authorities is "Where does our recycling end up?"

³ https://www.researchgate.net/figure/The-structure-of-six-layers-of-beverage-cartons_fig1_286512347

⁴ 'Collection of food and drink cartons at the kerbside', WRAP, 2017, Scholefield, French and Cook

⁵ <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england>

36. Increasingly, local authorities are seeking to improve transparency around the flow of materials collected for recycling to ensure that residents can be confident that their material is being handled in an appropriate way.
37. Viridor and Veolia operate in global markets selling quality recycle to commercial third parties and these commercial arrangements are beyond the direct control of local authorities. The Environment Agency is the regulating body and closely monitors shipments of material to other countries. We are assured that our contractors comply with UK waste shipment regulations and we are able to evidence how we meet our statutory and contractual obligations regarding the material that is managed by the Viridor and Veolia contracts.

Contract Reporting

38. Both the Viridor and Veolia contracts contain specific requirements outlining information they must submit to evidence not only quantitative information around recycling (tonnages, percentage recycled, reused or composted), but also qualitative context around their processes, facilities used and end markets.
39. This information ensures that there is an auditable trail to provide assurance that our waste and recycling is being managed appropriately.
40. Collected recycling material is bulked at several Waste Transfer sites across the County which may take material from one or more East Sussex authorities. Once this material is then transported to a sorting facility (such as Crayford) it becomes mixed with material from many other authorities. A single authority's material can usually be tracked as far as a WTS and sometimes beyond that – i.e. the MRF.
41. The geographical aspect of End Destination performance monitoring allows an environmental context to be placed alongside the usual weight based tonnage data which gives us a fully rounded view of contractor performance and how well we are managing our recycling. Whilst we are interested in how much tonnage our contractors are recycling, we are equally interested in how they are going about this i.e. through only using reputable companies, even if material is being shipped to the other side of the world because this makes sound economic and environmental sense.

Local Authority Reporting

42. Local authorities in the UK report their movements of waste via Defra's 'Waste Data Flow'⁶ system which collects statistical data covering collection and recycling of waste.
43. Within the data required is 'Question 100' where local authorities record all the treatment processes and End Destinations of materials that are collected for recycling. However, in terms of public perception, it is worth making the distinction between:

⁶ <https://www.wastedataflow.org/>

- A **reported end destination which** is the ‘Final Destination’ facility entered by a local authority in Q100; and
 - An **actual end destination which** is a final reprocessor that reprocesses materials into a “*new material, substance or product*” and achieves end-of-waste status for that material.
44. These can be the same location but in some cases, whilst a contractor may report a facility as a given material’s ‘End Destination’ (and then reported as such by a local authority) the material may then face further onward movement before it achieves end of waste status. This can be via third party agents or waste brokers and whilst this is a normal part of global commodity trading, it can mean that tracking the material becomes difficult hence ‘End Destinations’ are often the point at which visibility is a challenge e.g. aluminium drinks cans can become cans again or a variety of aluminium derived products used in car manufacture.
45. Whilst ESCC routinely works with its District and Boroughs Councils to report to Waste Data Flow, we have engaged with both Viridor and Veolia to go beyond this and provide information to identify the point where ‘end of waste’ status can be reasonably considered to have been achieved for any given material.
46. The Government provides guidance on making an ‘End of Waste Assessment’⁷ on any given material not covered by EU End of Waste Criteria⁸. This test assesses whether:
- the waste has been converted into a distinct and marketable product;
 - the processed substance can be used in exactly the same way as a non-waste substance; and
 - the processed substance can be stored and used with no worse environmental effects when compared to the material it is intended to replace.
47. The resource market for recyclate remains a global market, governed by the principles of supply and demand and commercial contracts. As such, confidentiality around aspects such as contract prices, lengths and even customers’ identity means that full visibility into every end destination is sometimes difficult to achieve.
48. Contract monitoring and regulatory reporting around End Destinations is also further strengthened by the work of the Government’s Environment Agency which is responsible for regulating the country’s waste exports industry. This also includes monitoring and investigating suspected illegal activities.
49. Appendix 1 provides not only a list of end-of-waste destinations per material handled by Viridor, but also a commentary document on those materials providing context around what process those materials undergo and what product is produced. The information provided by Viridor is relevant to co-mingled recycling by residents using kerbside bins and deposited at co-mingled containers at bring sites.

⁷ <https://www.gov.uk/guidance/turn-your-waste-into-a-new-non-waste-product-or-material>

⁸ https://ec.europa.eu/environment/waste/framework/end_of_waste.htm

50. Appendix 1 also provides the above but in this case is reported by Veolia and explains what happens to waste deposited by residents in their kerbside refuse bins, garden waste bins and recycling deposited at our network of 10 HWRS.
51. We are assured that both Viridor and Veolia are managing our waste and recycling appropriately. Both undertake their own inspections and auditing of End Destinations.

Conclusion

52. By working with experienced, specialist waste companies such as Viridor and Veolia, ESCC is confident that it has in place a robust system of traceability with regard to materials deposited by residents for recycling either at the kerbside, Bring Sites or via HWRS. Their relative size within the resource market helps ensure that they can procure secure, stable contracts for the provision of high quality recyclate to the marketplace.
53. Both companies are able to evidence their disposal routes and also accreditation received from the companies they work with which demonstrates that appropriate reprocessing has taken place.
54. ESCC is committed to driving constant improvement across its recycling contracts and will continue to work with both Viridor and Veolia to be able to evidence and document the journey of material placed out by residents at the kerbside and deposited at Household Waste Recycling Sites through our waste infrastructure and then its' movement until it reaches appropriate end-of-waste status.

Dr Anthony Leonard
Lead Director

Risk Assessment Statement

Contract reporting and monitoring mechanisms are in place to require both Viridor and Veolia to provide detailed information and context around a range of environmental considerations such as sustainable transport, reducing environmental impact, adhering to waste hierarchy objectives etc.⁹. However, the information supplied within the Appendix to this report have been compiled and submitted by our contractors. Whilst ESCC has auditing tools available to verify the majority of information submitted by our contractors, such as the inspection of Waste Transfer Notes for example, much of the larger movements of waste, especially where material is exported, can only be scrutinised by organisations such as the Environment Agency and therefore validation of this kind of information is not within the gift of the local authority.

⁹ IWMSC Schedule 11 'Annual Environmental Report', ESCC DMR Contract, Clause 17 'Performance Monitoring'

LIST OF ACRONYMS

DMR: Dry mixed recycling – the type of material we ask residents to put in their recycling bin

ERF: Energy Recovery Facility e.g. Newhaven

HDPE: High-density polyethylene – a type of plastic, often a bottle.

HWRS: Household Waste Recycling Site

IVC: In Vessel Composting Facility e.g. Woodlands

LDPE: Low-Density Polyethylene – a type of plastic often used in plastic bags

MRF: Materials Recovery Facility e.g. Crayford or Hollingdean

PET: Polyethylene terephthalate – a type of plastic, sometimes a bottle

PP: Polypropylene – a type of semi-rigid plastic often found in pots, tubs and trays

PTT: Pots, Tub and Trays

RCV: Refuse Collection Vehicle

RDF: Refuse derived fuel and is produced from domestic and business waste

SRF: Solid recovered fuel - a high-quality alternative to fossil fuel produced from mainly commercial waste including paper, card, wood, textiles and plastic

WCA: Waste Collection Authority e.g. Wealden District Council, Lewes District Council etc.

WDA: Waste Disposal Authority e.g. East Sussex County Council

WEEE: Waste Electrical and Electronic Equipment

WRAP: The Waste and Resources Action Programme - a registered UK charity

WTS: Waste Transfer Station – where waste is delivered and bulked for later onward movement e.g. Pebsham and Maresfield