



XR Zero Waste – Mixed
Waste Sorting to sharply
increase recycling and
reduce incineration

28-04-2021

OPEN LETTER TO THE PRIME MINISTER



Rt Hon Boris Johnson MP
Prime Minister
10 Downing Street
London SW1A 2AA

16 November 2020

Dear Prime Minister,

Energy-from-waste (EfW) incineration capacity in the UK is poised to expand by 20 million tonnes by 2030, more than doubling current capacity and locking the country into an additional 10 million tonnes of fossil-derived CO₂ emissions per year, primarily from burning plastics.¹ By failing to consider whether this growth is compliant with the Paris Agreement and the UK's net zero obligations, the Government effectively inhibits the full decarbonisation of the power sector.² Moreover, the EfW sector's expansion impairs the transition to a circular economy and hinders green job growth, thus depriving the UK economy of a critical economic boost.³

We, the undersigned, call for **concerted government action to decarbonise the waste sector**—including through consideration of net-zero obligations regarding planned EfW incinerators—noting that the Committee on Climate Change has warned that the UK is not on track to meet the fourth or fifth carbon budgets (2023–27 and 2028–32) and that “progress will need to accelerate” if the UK is to achieve net zero by 2050.⁴

Delivering on net zero requires transitioning to a circular economy for CO₂ savings.⁵ The good news is that the UK is uniquely positioned to jump-start a **world-leading transformation of the waste and resource sector** as part of its post-Covid recovery. Through regulatory reform and a dedicated investment programme, the Government can accelerate the transition towards a zero-carbon, zero-waste circular economy. Even a moderate, entirely workable shift will allow the UK to:

- slash UK CO₂ emissions by 15%—or 68 million tonnes per year—by 2030;⁶
- reduce pollution, thus improving air quality and public health;
- inject £35 billion into the economy by 2030 via recycling, repair, reuse, rental, and remanufacturing;⁷
- create more than 200,000 new jobs and tackle unemployment;⁸ and
- make a decisive contribution to attaining climate neutrality by 2050.⁹

We call on the Government to secure these benefits and to propel the country swiftly up the waste hierarchy, in part by implementing the following evidence-based policy and legal instruments:

- a **waste and resource sector law that requires net-zero carbon** by 2035, inclusive of EfW incineration emissions, in line with targets set by the governments of Denmark, Finland, Norway, and Sweden;¹⁰
- a recycling target of 70% by 2030 under the **Environment Bill**, as per the Committee on Climate Change recommendation for meeting the UK carbon budgets and a net-zero-carbon economy by 2050;¹¹
- a “residual” (non-recyclable) waste reduction target of 50% by 2030 in statutory instruments under the **Environment Bill**;
- a **law on waste market reform** to attract investment in recycling infrastructure and to level the playing field, with provisions for a market regulator and annual auctions for the processing of residual waste and recyclates (recyclables);
- a circular economy capital investment programme as part of the **National Infrastructure Strategy**, to mobilise infrastructure investment that will support reuse, repair, remanufacturing, and recycling of scrap steel, glass, paper and board, plastics, and biowaste;
- a **law on product reuse and repair** that sets out targets for the reuse of durable products, mandatory product labelling of lifespan and reparability, and consumer right-to-repair rules; and
- an update to the 2014 **National Planning Policy for Waste** to require waste planning authorities to demonstrate that no readily recyclable dry or organic materials are sent to landfill or EfW incineration, as part of the identification and planning of waste management infrastructure.¹²

XR Zero Waste: Transitioning to a circular economy without more EfW incineration (2020) Page 1


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XR Zero Waste
xrzerowaste@protonmail.com

Your ref: 137244
Our ref: PO2020/30615/FTH
19 February 2021

Dear XR Zero Waste team,

Thank you for your letter of 16 November to the Prime Minister, and your email of 29 October to Lord Goldsmith about transitioning to a circular economy and incineration capacity. The Prime Minister appreciates you taking the time to write to him detailing your views. He has asked that I respond to set out the Government's position on this matter.

The UK Government is determined to deliver on its net zero commitments and, as host of the international COP26 climate summit in Glasgow later this year, we seek to lead by example. On 18 November 2020 the Prime Minister outlined his ambitious Ten Point Plan for a Green Industrial Revolution, which will enable the UK to forge ahead with delivering its target of net zero. The plan covers clean energy, transport, nature and innovative technologies, including becoming a world leader in carbon capture.

There is no doubt that climate change is one of the greatest global challenges we face, and action is urgently needed in the UK and across the world. Reducing carbon emissions and enhancing the environment are major Government priorities. The UK is already a leader in climate change and clean growth, having reduced emissions by more than 40% between 1990 and 2018 – the fastest rate in the G7 – and decarbonising our economy faster than any other G20 country since 2000. We are the first major economy in the world to legislate for net zero greenhouse gas emissions.

Meeting our net zero target will require us to build on this progress by transforming our economy – our homes, our transport, our industries, how we generate and use energy, and how we use our land. That is why we set out ambitious plans at the Budget and will be focusing on continuing to develop our net zero strategy in advance of COP26 – including through strengthening our plans for decarbonisation in key sectors.

The Government's landmark Resources and Waste Strategy, published in 2018, sets out our intention to move away from the linear ‘make, take, use, throw’ economic model towards a more circular and sustainable economy. By keeping resources in use for longer, through reuse and recycling for example, we can reduce the need to extract raw materials and avoid emissions involved in extraction, processing and manufacturing. This will result in less waste being generated and minimise the types and amount of waste reaching the lower tiers of recovery and disposal. A more circular and resource efficient approach holds significant benefits for green growth and jobs, addressing regional inequalities and limiting environmental damage.



- Sent 16 November signed by RT HON Jeremy Corbyn MP for Islington North (among 19 MP's)
- With 9 pages of policy reform proposals
- Response received 19 February from secretary of state RT HON George Eustice MP
- ‘Although the above demonstrates how much we are doing, we will continue to need ambitious and innovative ideas and policies to meet our net zero commitments. To that end, we welcome the contribution of XR Zero Waste and others to the debate on how to reduce emissions in the resources and waste sector. Whilst we do not fully accept some of the analysis underpinning the assumptions you have made, we will give further consideration to these detailed suggestions as we continue to develop our approach to resource and waste management, moving towards net zero and being a world leading circular economy’

<https://www.xrzerowaste.uk/view-the-letter>

<http://www.xrzerowaste.uk>

ACTION BRIEFS FOR COUNCILS



TEN ACTION POINTS FOR CAMDEN COUNCIL: HOW TO REDUCE RESIDUAL WASTE BY 65% AND ACHIEVE 70% RECYCLING BY 2030

In April 2020, the chair of the North London Waste Authority (NLWA), Sir Chris Jones, was off to Frankfurt for the circular economy in June 2020. He did not have the usual meeting with CDS Members to talk about the waste management plan in Camden and was aware of the common interest, such as the vital practical and compelling work in waste management and recycling for the benefit of the planet and future generations. In response, XR Zero Waste is pleased to offer Camden Council the brief, which sets out ten action points designed to help the council cut its residual waste by 65% and reach 70% recycling by 2030.

BENEFITS
By implementing the ten action points in Table 3 (see page 23), Camden Council would:

- **SAVE ABOUT £340,000 PER YEAR BY 2030**, an offsetting amount being around £100,000 per year. Based on the Council's own recycling savings estimates, while implementing the action plan would save around £100,000 per year, the net savings translate into a 65% reduction in Camden Council's £2.7 million waste collection budget.
- **CUT ANNUAL CO2 EMISSIONS BY 70% (28,000 tonnes)** by 2030 by diverting all waste from landfill, cutting the incineration rate by 25%, and boosting recycling to 70%. This will save from business air travel* would allow Camden to save a total of 14,000 tonnes of CO2 by 2030. The council would also save 33,000 tonnes of CO2 per year by 2030 by obtaining the need for virgin material production.

CONTEXT AND RATIONALE
The UK Climate Change Committee (CCC) reports that achieving significant emission reductions in the waste sector requires a step-change towards a circular economy, moving away from landfill and incineration, and towards a reduction in waste arising and collection of separated valuable resources for reuse and recycling.

To meet these goals, the CCC calls on the UK government to set a 70% recycling target by 2030, an increase over the target of 65% set for 2025.¹⁷ This is a critical because recycling and reuse allow for substantial carbon emission savings by obviating the need for virgin materials. In contrast, both landfill and energy from waste (EFW) incineration cause significant carbon emissions, not only because decomposition and incineration release greenhouse gases into the atmosphere, but also because significant quantities of virgin materials require more extraction and mining.

The plan's draft estimated the quantity of air pollutants of residual waste away from landfill and towards EFW incineration. This shows 2025-100, the plan's draft estimated the circular economy, meaning that waste will need to be re-designed/generically diverted away from landfill and EFW incineration, and redirected towards reuse and recycling.

CAMDEN'S WASTE MANAGEMENT IN 2020
Since Camden Council's current waste management targets are based on historical trends, achieving them means sending to business as usual. The Council aims to increase recycling of both authority collected waste (ACW) and delivered by vehicle from 24% in 2018/19 to only 28% by 2025 (see Table 4). In contrast, the ten action points in Table 3 would allow Camden Council to achieve a recycling rate of 70% and reduce residual waste flows by 65%, from an estimated 83,400 tonnes in 2018/19 to 29,278 tonnes in 2030, based on inter-annual recycling targets by 2030.

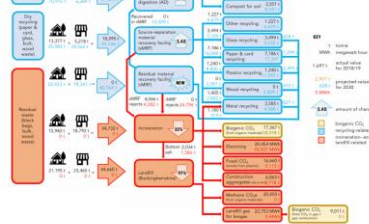
Figure 2 illustrates the impact of achieving the ten action points on Camden Council's waste management. The plan's draft estimated the quantity of air pollutants of residual waste away from landfill and towards EFW incineration. This shows 2025-100, the plan's draft estimated the circular economy, meaning that waste will need to be re-designed/generically diverted away from landfill and EFW incineration, and redirected towards reuse and recycling.

Table 4 Camden's Reduction & Recycling Plan targets

| Target | 2018/19 | 2025 | 2030 |
|-----------------------------------|---------|-------|-------|
| Residual waste per household (t) | 3.5 | 2.5 | 1.5 |
| Residual waste per household (kg) | 3,500 | 2,500 | 1,500 |
| Residual waste per household (£) | 350 | 250 | 150 |
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Table 5 Camden's waste economic statistics

| Statistic | 2018/19 | 2025 | 2030 |
|-----------------------------------|---------|-------|-------|
| Residual waste per household (t) | 3.5 | 2.5 | 1.5 |
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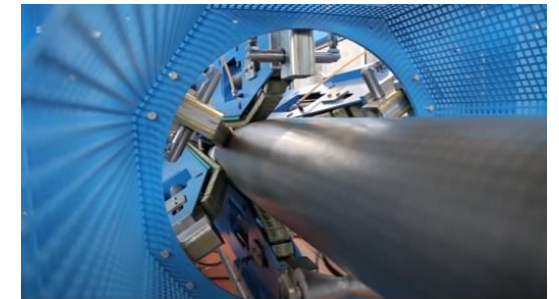
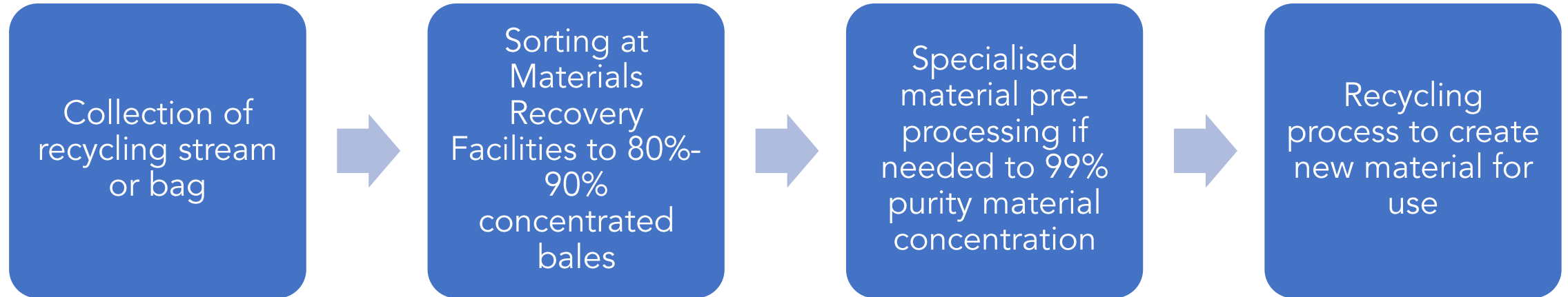
XR Zero Waste: Ten Action Points for Camden Council • Month 2021 • Page 8

Table 3 Action plan for Camden Council¹⁸

| ACTION POINTS | EXPECTED IMPACTS | REQUIREMENTS | START & EST. COST |
|--|--|---|---|
| 1. Create annual waste and recycling collection heat maps to inform all actions. Like election campaigns, recycling campaigns can be smart. For at least one month's collection per year for households and businesses, map a) the ratio of recycling to residual waste, and b) the type, number, and quality of bins used. ¹ | Improvements across all other actions and better value for money | Veolia to implement (may require contractual changes) | 2022 £30,000 for annual heat map production |
| 2. Set up a business recycling programme and roll it out across the borough. Most businesses in Camden do not recycle. Develop and disseminate clear guidance for restaurants, shops, and offices that want to enhance their recycling, and offer dedicated training and storefront business recycling certificates. ² | 10% increase in business recycling rate by 2025, 15% increase by 2030 | Collaboration with the NLWA and London Recycles | 2021 £60,000 for annual training and materials |
| 3. Work with residents to grow a network of zero-waste 'promoters' to motivate businesses to recycle more. By leveraging the power of in-office, in-store, and social media recycling feedback to businesses and supervisors, joint prosumer action can transform business habits. ³ | 7.5% increase in business recycling rate by 2025, 20% increase by 2030 | Residents' network with 1,000+ members by 2023, work with Keep Britain Tidy | 2021 £40,000 per year for zero-waste prosumer programme |
| 4. Maintain bins and bin housing areas annually. Check that all households have access to high-quality bins; adequate recycling bins are available; all bin lids are easy to open; and signage is up to date and easy to read, on bins and in bin areas. ⁴ | 5% increase in household recycling rate by 2025 | Veolia to submit detailed annual maintenance report | 2021 Savings (as Veolia LACW service costs fall) |
| 5. Improve reuse and bulk waste collection options. Provide free annual bulk waste collection for each street or street segment and help businesses set up one highly visible reuse donation point for every 10,000 households. ⁵ | 10% increase in household reuse rate and 3% increase in recycling rate by 2025 | To implement in collaboration with the NLWA | 2022 £70,000 for 700 annual bulk collections, £100,000 per year for 10 donation points |
| 6. Improve recycling campaigns and instructions to residents. Supply clearer rules of thumb, develop and implement more effective door-to-door communications ('doorstepping') strategies, make information on council web pages more user-friendly, and highlight environmental and economic benefits of recycling in awareness raising programmes. ¹⁰ | 5% increase in household recycling rate, 10% increase by 2030; 15% less contamination by 2025, 30% less by 2030 | To implement in collaboration with the NLWA | 2021 £20,000 per year for communications, £50,000 per year for doorstepping |
| 7. Enhance food waste collection. Ensure that food waste is collected from all households, including the 4,500 Camden flats above shops that lack food waste collection. Promote business food waste collection. Improve food waste signage, bins, and bag availability. Increase household and business participation by initiating and expanding zero food waste training, raising awareness of financial savings and reductions in CO2 emissions, and publicising food waste prevention apps. ¹¹ | Increase in organic recycling (30% for households, 15% for businesses), 10% improvement in food waste prevention, and 20% less contamination by 2030 | Programme to be developed with the NLWA, food waste groups, and other boroughs | 2021 £120,000 per year for zero food waste training £45,000 for caddies to collect food waste from flats above shops |
| 8. Adapt and implement the 2011 Welsh Collections Blueprint (the best guide available). Begin separate waste collections of glass and paper & card—single-stream for houses and multi-stream for flats; reduce container capacity for residual waste; and stop collecting residual 'side waste'. ¹² | At least 10% increase in household recycling, as Welsh councils achieved under the Blueprint | To implement in collaboration with Veolia or alternative waste collection provider | 2025 (Veolia contract expires) Costs depend on which Blueprint actions are carried out |
| 9. Work with the NLWA, the GLA, and industry on specialised recycling collections and infrastructure. Footwear, mattresses, carpets, and other textiles—which together account for 10% of waste arisings—could be recycled with the latest technology, but they are not. Modern sorting and separation technology can help improve the recycling rate for clothing (now 29% nationally). ¹³ | At least 5% increase in household and business recycling by 2030 (assuming 50% specialised items recycling) | The NLWA to carry out feasibility studies, including horizon scanning of available and emerging technologies | 2021 (with recycling beginning in 2023/24) £30,000 per year for feasibility studies |
| 10. With the NLWA and industry, ensure that the latest recovery and recycling technology is deployed for collected residual waste and recyclables, while taking advantage of company investments unlocked by the new plastics packaging tax. Technology exists for material recovery of residual waste for recycling, especially plastics and organics, but it is not used to treat Camden's waste. Similarly, Biffa and the NLWA have yet to deploy existing technology for polystyrene and dense plastic recycling. ¹⁴ | At least a 30% increase in organic recycling and 10% increase in dry recycling by 2030 | Biffa and the NLWA to invest in a feasibility study for a residual material recovery facility (MRF) and other technological innovations | 2022/23 No additional costs to Camden Council |

- Ten action points for UK councils
- How to reach 70% recycling and at least 50% residual waste reduction by 2030.
 - Where are we now?
 - What can be done?
 - What will it cost?
 - What will the impact be?
- Action plan launched for Camden with first communications initiated.
- More action plans to follow soon – including for Islington Council.

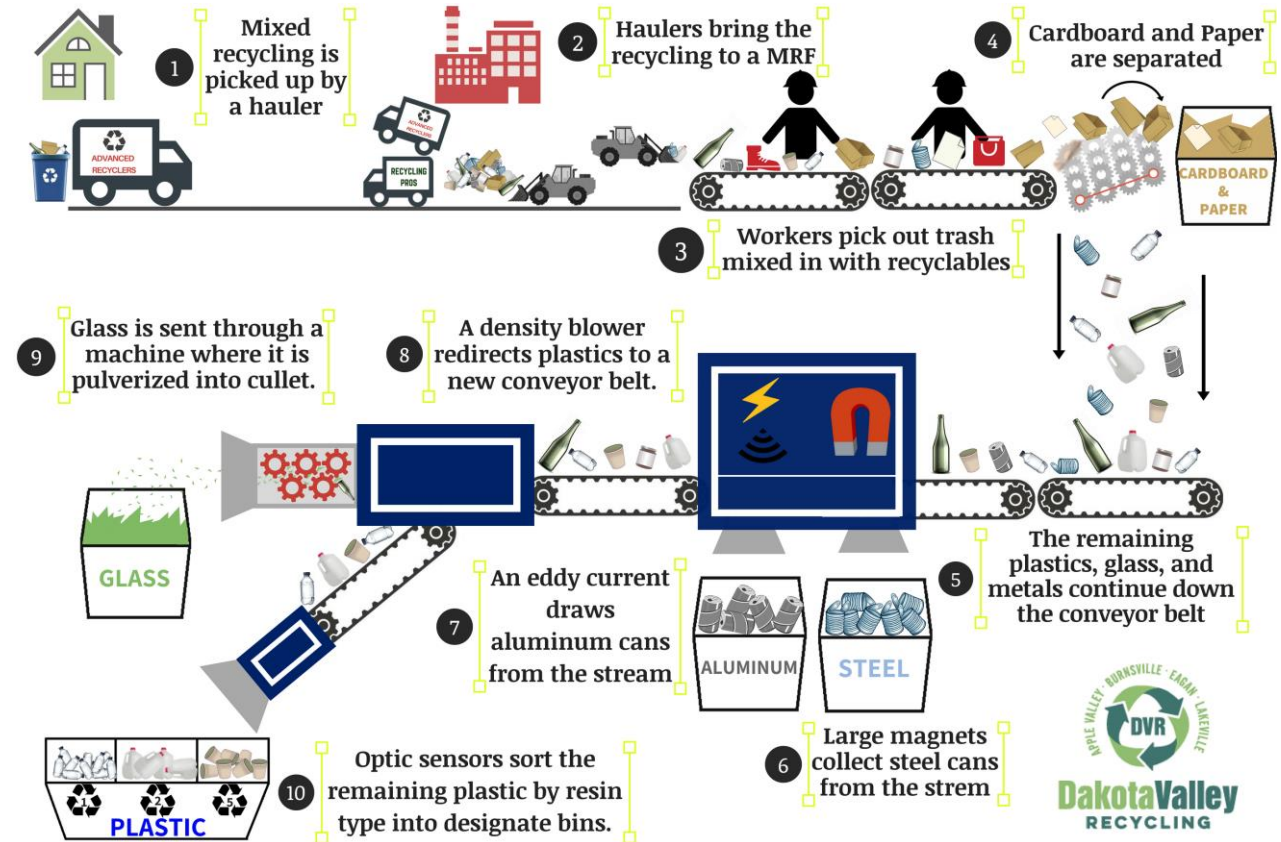
HOW DOES OUR RECYCLING WORK AT THE MOMENT?



MATERIAL RECOVERY FACILITIES WHAT ARE THEY AND HOW DO THEY WORK?



- Sorting of wastes collected for recycling
- Separation into bales with one material type (called recovered materials).
- Best performing facilities recover 92% of wastes and send these to recycling facilities

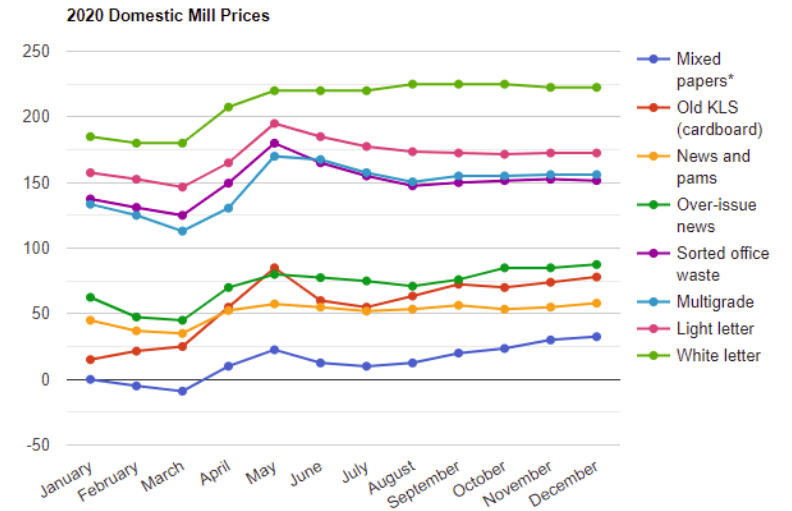
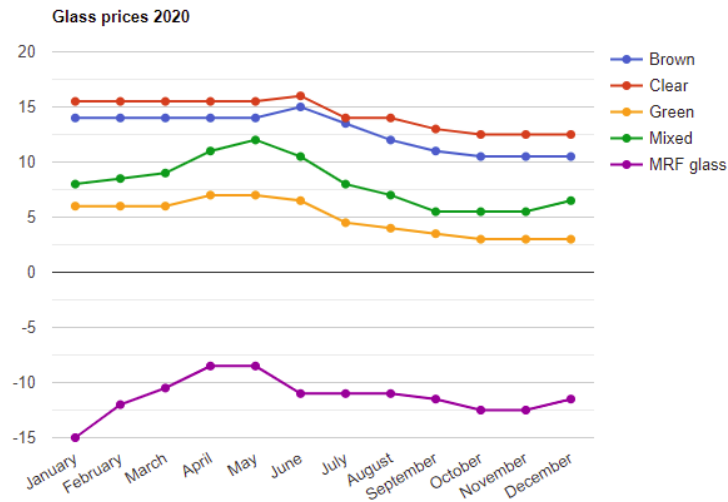


MATERIAL RECOVERY FACILITIES

WHAT ARE THEY AND HOW DO THEY WORK?



- The bales sent from MRF's to recyclers are valuable and give the council or company operating the MRF income.
- The value depends on the material and the purity (e.g. 100% single material)



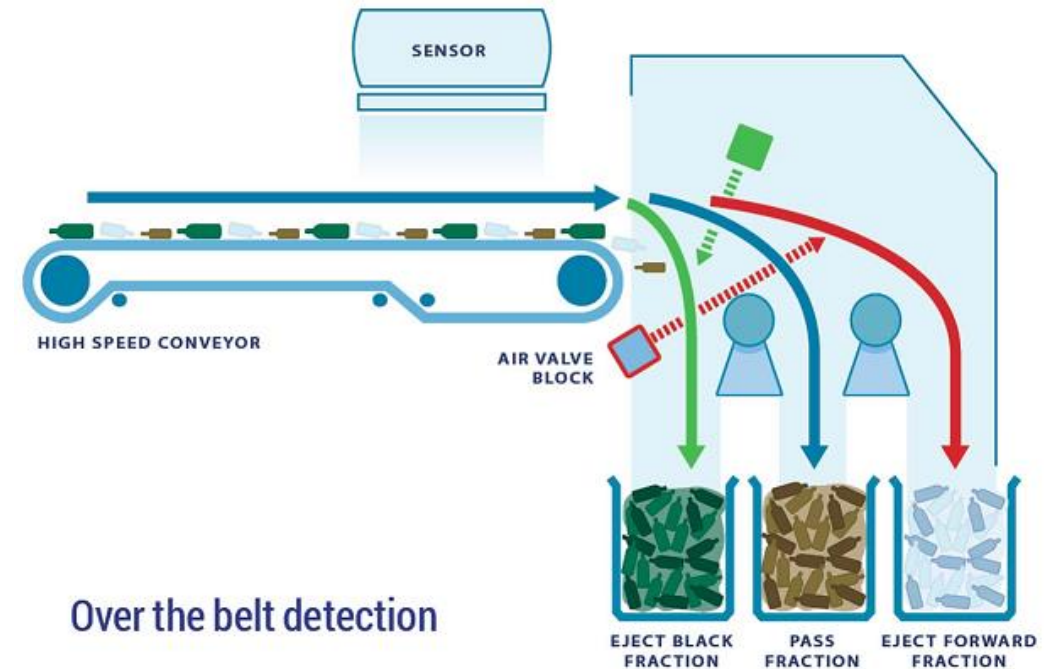
MATERIAL RECOVERY FACILITIES

WHAT ARE THEY AND HOW DO THEY WORK?



Sorting happens based on various material properties:

- Manual sorting (unwanted items)
- Size sorting (larger/medium/small)
- Density sorting (weight differences)
- Optical sorting (light differences)
- Magnetic sorting (magnetic differences)



MATERIAL RECOVERY FACILITIES NEW TECHNOLOGIES



New techniques and improvements:

- Continuous improvement of optical sensor recognition
- Robotic with AI sorting - first applied in a new MRF in Coventry
- Improved recognition of packaging based on specially machine readable printed labelling (holy grail 2.0 project)



These will lead to more consistent 95%+ recovery sent to recycling performance



MATERIAL RECOVERY FACILITIES CURRENT LIMITATIONS - GLASS



- In the UK only a few Material Recovery facilities for co-mingled recycling can deal with glass
- Almost none carry out colour sorting of glass – usually done by glass re-processors/recyclers
- England is shifting to deposit return schemes for glass
- England may shift to separate kerbside collection of glass depending on national streamlining of collection systems (this is requested by the glass industry)

MATERIAL RECOVERY FACILITIES

CURRENT LIMITATIONS AND PROBLEMS



- Black plastics are difficult to optically recognise
 - (solvable by changing the 'type of black colour')
- PE and PP plastics have very similar properties and are difficult to distinguish optically
 - (Impact Recycling from Glasgow has a solution using fluids and density, Umincorp from the Netherlands has a similar solution)
- These solutions and more are available but barely deployed



MATERIAL RECOVERY FACILITIES CURRENT LIMITATIONS AND PROBLEMS



- Multi-layer packaging is not suitable for recovery and recycling, examples drink cartons or metallised plastics
 - (tons of solutions exist incl. bag-in-a-box, shifting to mono-materials, truly bio-degradable layers)
- Plastic labels are usually not recyclable and a different plastic than the plastic packaging, or contaminate an entirely different material like cardboard
 - (easy to remove labels or no-label solutions exist)
- These solutions and more are available but barely deployed



WHAT IS MIXED WASTE?

- Mixtures of household plastics, metals, glass, organics, paper, textiles etc. (Residual waste or black bag waste)
- Rejected wastes from a sorting facility that sorts household waste collected for recycling (both before and after)
- I have not studied commercial & industrial mixed waste sorting, yet that would work similarly



WHAT IS MIXED WASTE?



WHAT IS MIXED WASTE?



MIXED WASTE RECOVERY FACILITY

WHAT ARE THEY AND HOW DO THEY WORK?

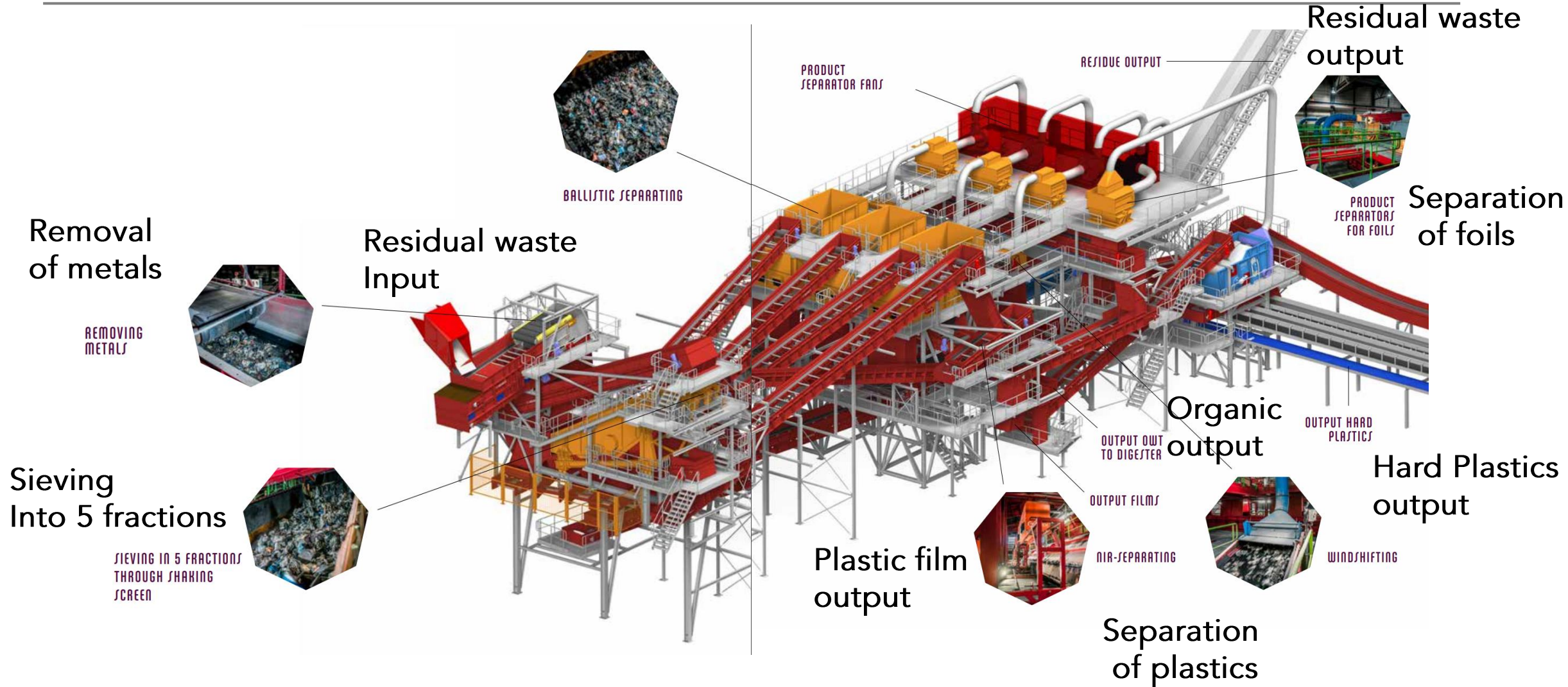


- Sorting of mixed wastes collected for recycling. Also referred to as 'dirty' MRF's or post-separation technology
- Today's technology should not be compared with facilities in the UK with older technology
- Best performing facilities today recover about 40 % of wastes out of black bags and send these to recycling facilities, and the aim is to increase this to 60% in the near future.
- The performance can be improved a lot based on material design and better economics (for example for multi-layer packaging)
- Technical details: <https://www.banzo.nl/wp-content/uploads/2017/01/109143-Banzo-Waste-recycling-Solutions-Brochure-Engels-1116.pdf>

| Waste stream | Recovery* |
|----------------------------------|--|
| Plastic packaging | >70% |
| Plastic foils | >50% |
| Drink cartons | >70% |
| Metals | >70% |
| Sand and inert materials | >50% |
| Organic waste | >55% |
| Glass | >45% |
| Paper and cardboard | >45% |
| Multilayer packaging | Can be recovered, yet currently not recycled |
| Average recovery efficacy | 40%-60% |

* % total wet mass per individual waste material recovered from residual mix.
Data sources: <https://www.omrin.nl/uploads/archief/bestanden/jaarverslagen/jaarverslag-2019-afvalsturing-friesland-nv.pdf>; <https://www.westerwolde.nl/file/11016/download>

MIXED WASTE RECOVERY FACILITY WHAT ARE THEY AND HOW DO THEY WORK?



MIXED WASTE RECOVERY FACILITY

WHAT ARE THEY AND HOW DO THEY WORK?



- Not to be confused with Mechanical and Biological Treatment (MBT) facilities...
- MBT facilities only recover between 1% to 18% of waste out of residuals, and have been primarily built to make fuel for incinerators.

| Recycled Material | Range reported | Observations |
|----------------------------------|----------------|---|
| Metals (Ferrous and Non Ferrous) | 1 - 3% | All MBTs recover metals – may include metal recovery from IBA from resultant thermal treatment of outputs |
| Heavies (Glass and Stone) | 0 – 8% | Generally need to pay (reduced) disposal cost |
| Plastics | 0 – 6% | With low oil prices, poor quality and reduced demand from China, very limited available markets |
| Organic Fines | 0 – 9% | Used to produce CLO for land remediation |
| Total | 1 – 18% | |

Figure 6: Reported Recycling Rates at UK MBTs

DIFFERENCE BETWEEN MBT AND MIXED WASTE RECOVERY FACILITIES



MBT ([example Southwark](#))

- 1) first shred the waste
- 2) split the waste into a small and large fraction
- 3) extract metals and some plastics → to bales for recycling
- 4) stabilise the remainder via bacteria (the majority) → to incineration
- 5) incinerate the remaining residual waste

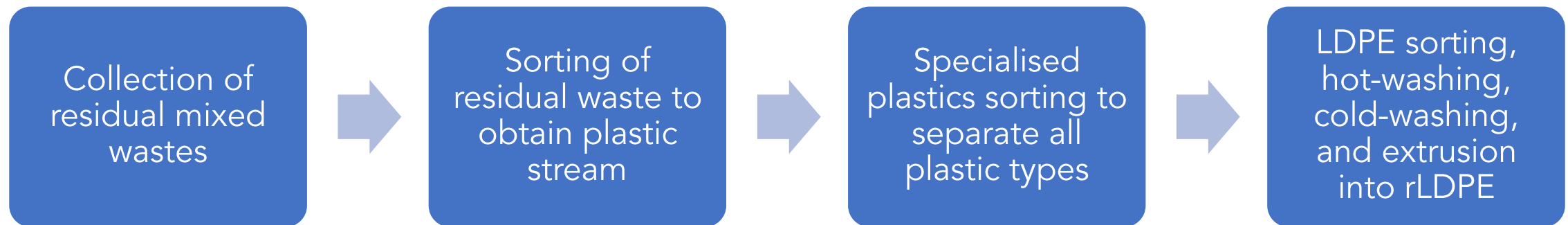
Mixed Waste Recovery ([example de Wijster](#))

- 1) sort the residual waste in three or more fractions and extract the ferro-metals with magnets,
- 2) remove the light materials (primarily foils) via air separators from the two largest fractions → to bales for recycling
- 3) send the smallest fraction (primarily sand, stone and organic materials) to anaerobic digestion (organic recycling)
- 4) remove the plastics and drink cartons from the two larger fractions → to bales for recycling
- 5) do manual checks on each stream on conveyor belts.
- 6) Incinerate the remaining residual waste

MIXED WASTE RECOVERY FACILITIES EXAMPLES



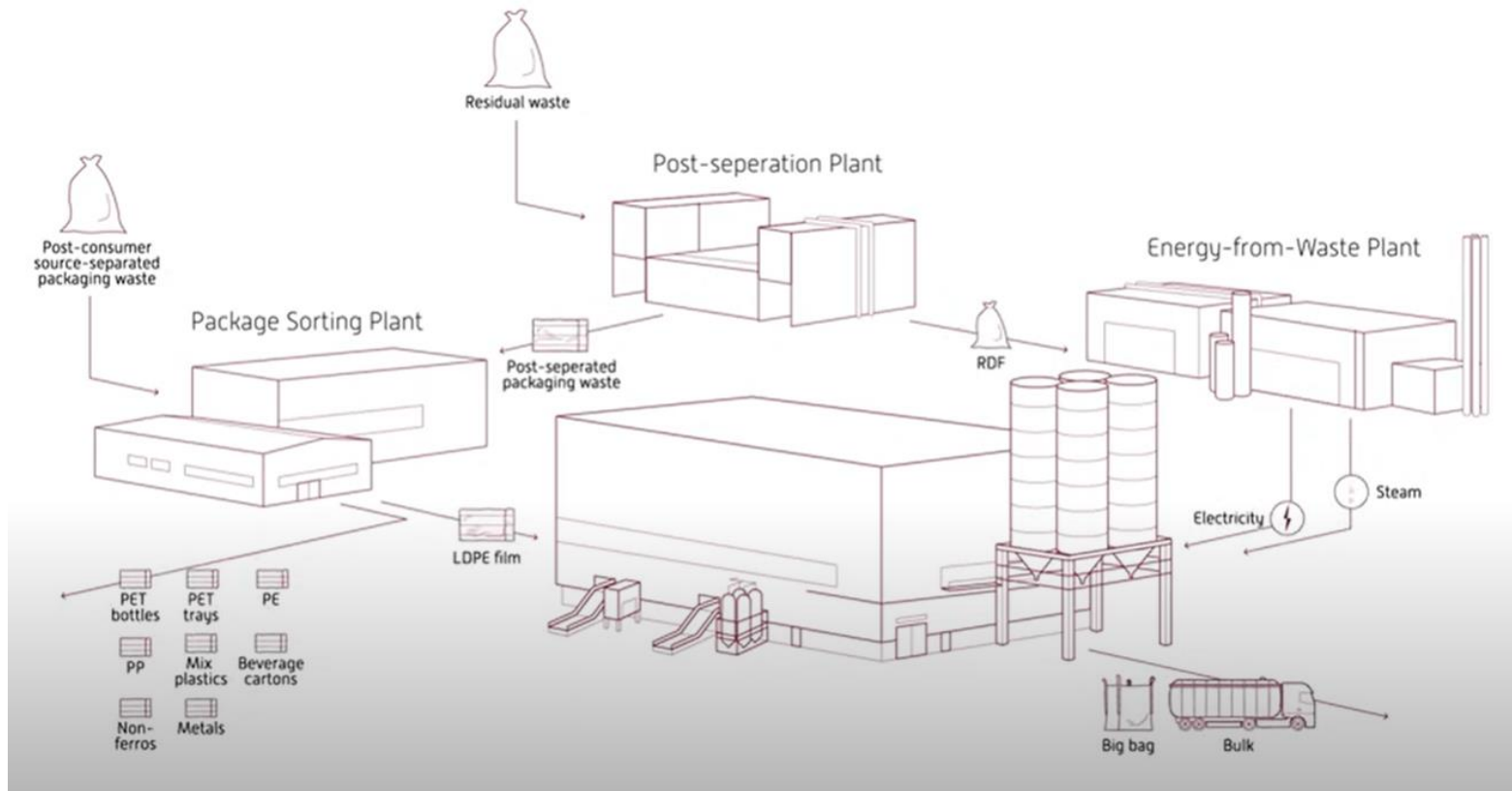
- De Wijster (The Netherlands). 800,000 tonnes capacity mixed waste sorting facility
- Operational since 2011
- Includes an on-site anaerobic digester, a dedicated plastics sorting facility, and a plastic film recycling facility.
- Direct on-site residual waste to LDPE plastics regrind pellets (rLDPE) for making new plastic film and plastic bags
- 24,000 tonnes of LDPE processed per year



PLASTIC PACKAGING SORTING PLANT



Plastic packaging sorting plant at de Wijster

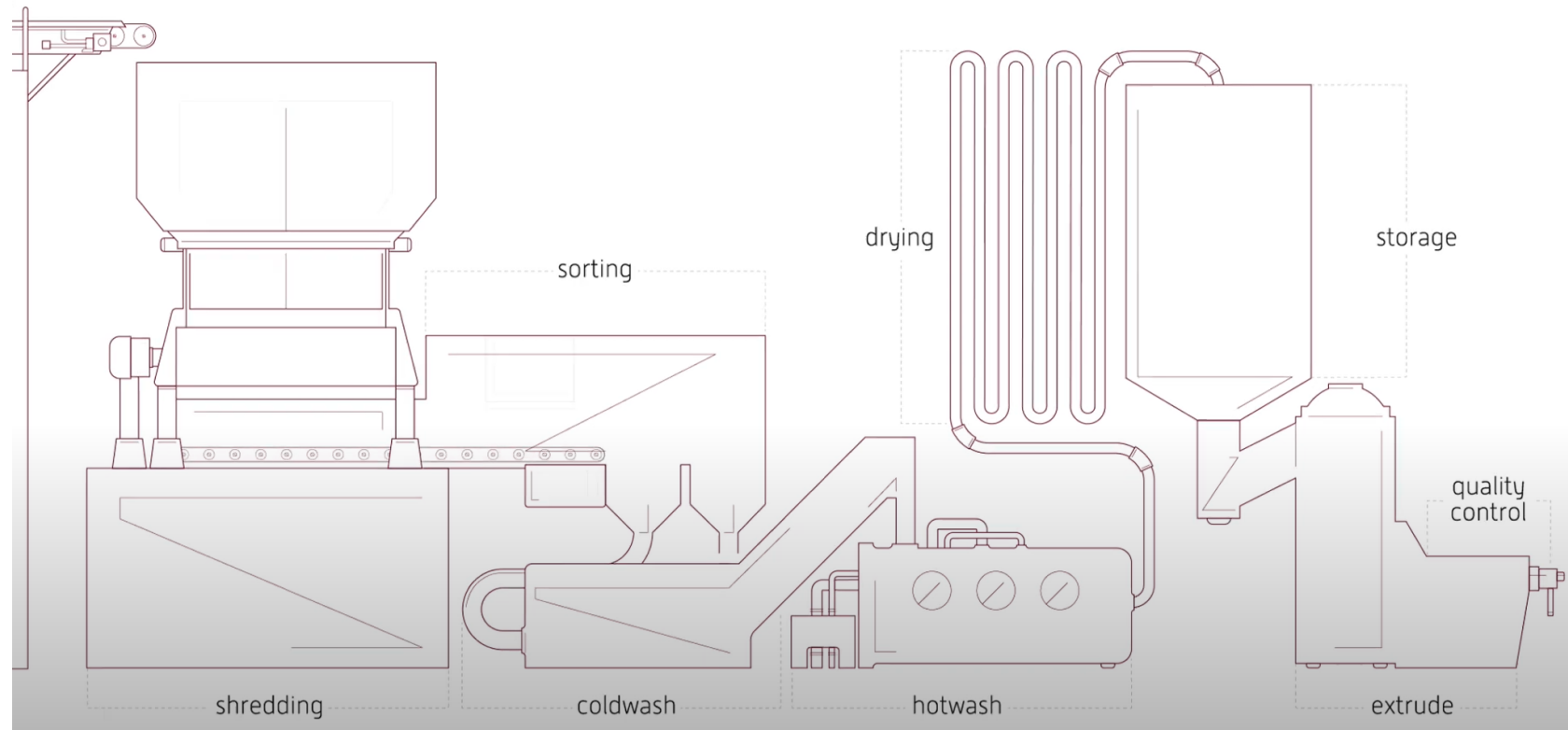


<https://www.banzo.nl/reference/attero-wijster-kunststofsorteerinstallatie?lang=en>
Video of a similar facility in English: <https://www.youtube.com/watch?v=27mEV0LwcM> (<http://www.xrzerowaste.uk>)

PLASTIC FILM RECYCLING PLANT



Plastic film recycling plant at de Wijster



<https://www.youtube.com/watch?v=nI0XQeWDnQ4>

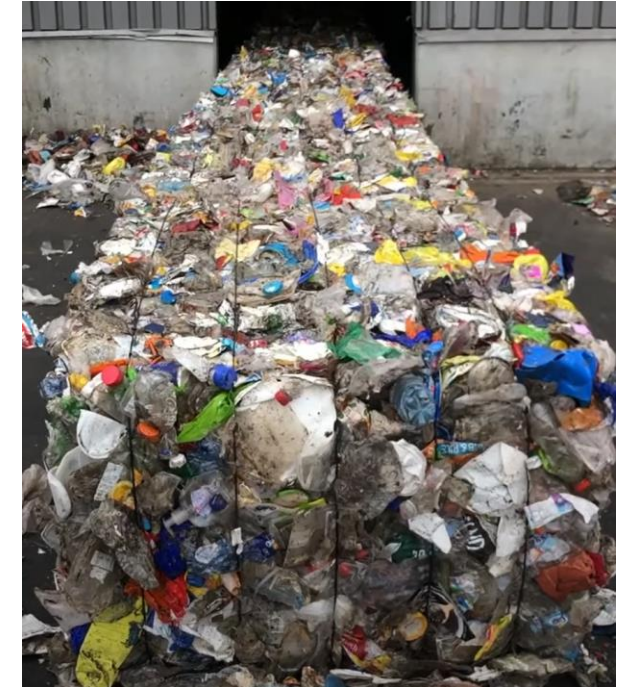
<https://www.banzo.nl/reference/attero-wijster-kunststofsorteerinstallatie?lang=en>

<http://www.xrzerowaste.uk>

MIXED WASTE RECOVERY FACILITIES EXAMPLES



- Rotterdam (the Netherlands) – AVR facility
- Operational since 2019
- Separates out plastics and metals from residual wastes into hard plastics, soft plastics, drink cartons and metals streams
- About a 51% recovery performance
- No separation of organics
- Amsterdam and Rotterdam have stopped source separation because of much higher performance of mixed waste recovery
- Video in Dutch:
<https://www.youtube.com/watch?v=6FgnLbAZizc>



AMSTERDAM PLASTICS SORTING FACILITY



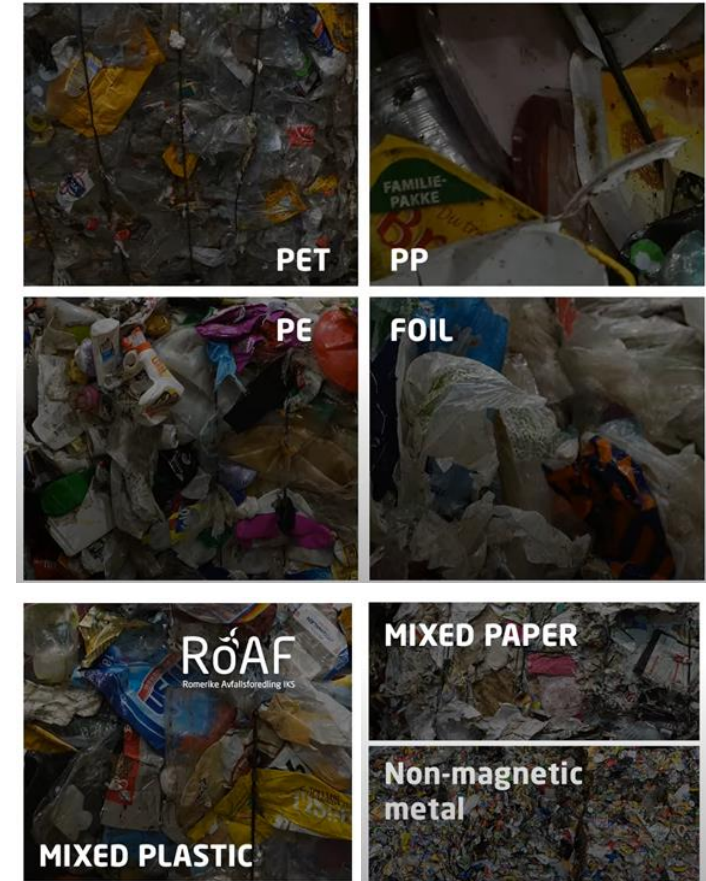
- Amsterdam (the Netherlands) – AEB plastics sorting facility
- Takes plastics recovered from various cities (including Rotterdam)
- Operational since 2018
- Separates plastics into types, shredding into flakes, hot-washes the flakes and sends them for recycling
- No colour-sorting yet
- Working with Umincorp for further refinement (of PE and PP)



MIXED WASTE RECOVERY FACILITIES EXAMPLES



- Oslo (Norway) – Romerike waste processing (ROAF)
- Fully automatic mixed waste processing plant
- Operational since 2016
- Takes food waste (green bags) and residual waste bags that are separated first
- Separation into metals, five types of plastics, sorts out 2500 tonnes of plastics per year
- Food waste goes into anaerobic digestion
- <https://www.wastetodaymagazine.com/article/romerike-avfallsforedling-roaf-automated-mixed-waste-facility/>
- Video: <https://www.youtube.com/watch?v=AWwmwLPaSc0>



MIXED WASTE RECOVERY FACILITIES EXAMPLES



- Glasgow (Scotland) – Recycling and Renewable Energy Centre
- Operational since 2019 by Viridor
- Capacity of 350,000 tonnes of residual waste which is sorted, taking out plastics and metals, and sends the food waste to anaerobic digestion
- Send the remainder to incineration



<https://www.viridor.co.uk/energy/energy-recovery-facilities/glasgow-rrec/>

Video:

https://www.youtube.com/watch?time_continue=58&v=YV3-vMpktE&feature=emb_logo



MIXED WASTE RECOVERY FACILITIES EXAMPLES



- Pacific Northwest Secondary Sorting Demonstration Project (PNW Sort)
- Take the residual mixed wastes from primary MRFs that sort materials collected for recycling and sort the hard to sort leftovers
- Can be combined with a mixed waste recycling facility setup
- <https://www.recyclingtoday.com/article/secondary-sorting-at-mrfs-improves-recovery/>
- <https://www.plasticpackagingfacts.org/wp-content/uploads/Pacific-Northwest-Secondary-Sorting-Demonstration-Project.pdf>
- <https://www.youtube.com/watch?v=hd0Uauq0GO0>

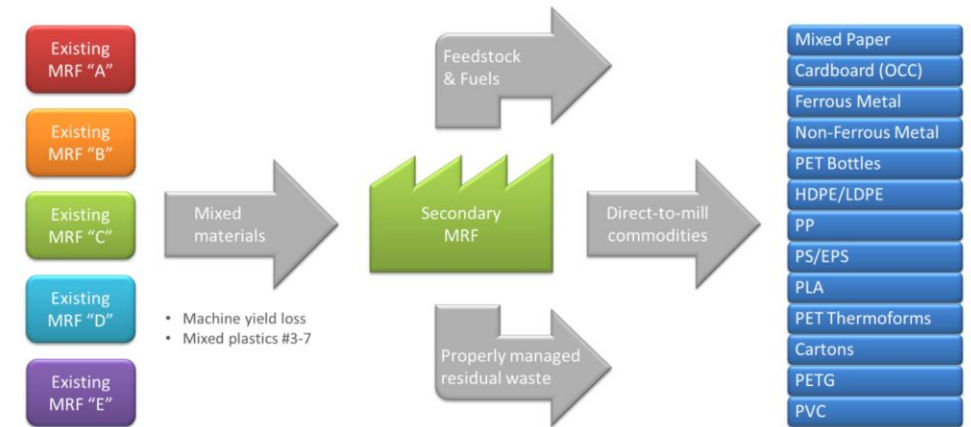


Figure 4. Secondary MRF Process Flow

-
- Colour sorting of plastics (transparent, red, blue, green, yellow and grey/black) - already done in the most modern plastic film recycling facility in Bulgaria by Integra Plastics (<https://integra-plastics.com/lab.php>)

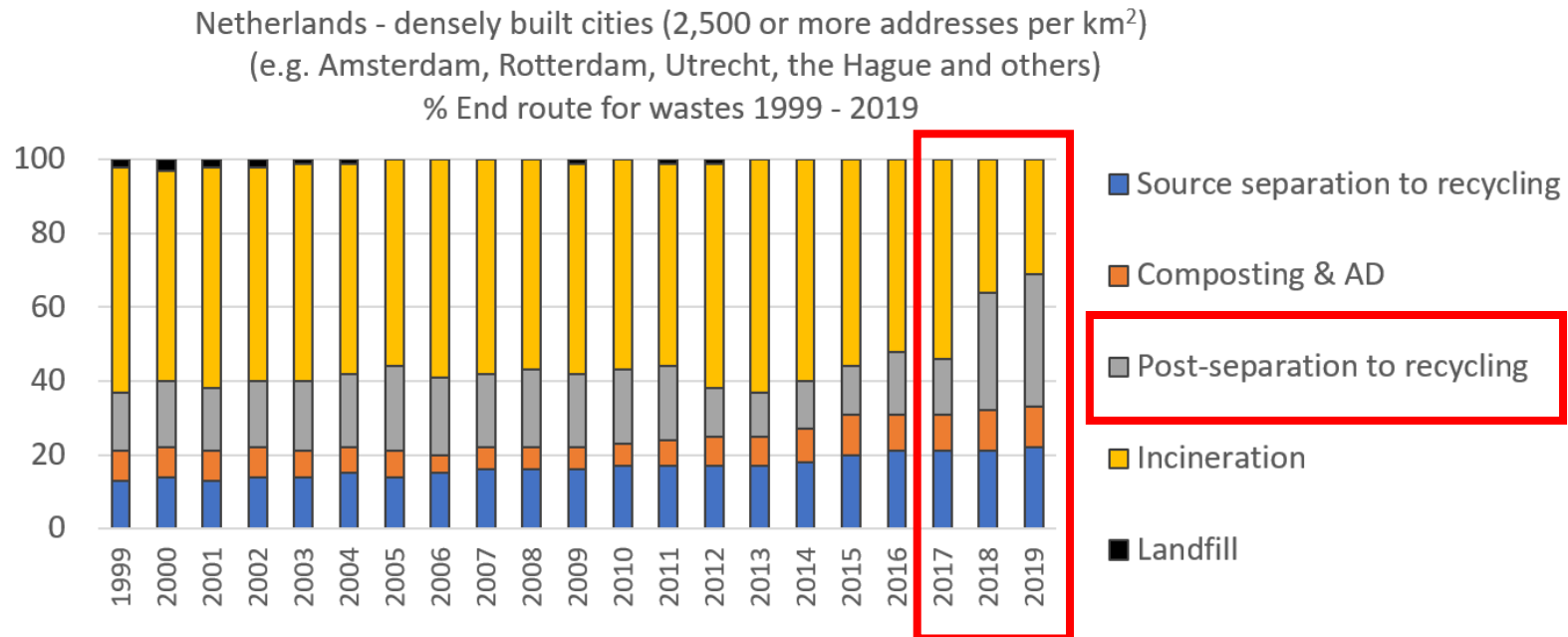
WHAT DOES THIS MEAN FOR ENGLAND? EXAMPLE FROM DUTCH CITIES



The Netherlands as an example:

- Incineration declined from 54% to 31% in 2 years in densely built cities.
- Wastes sent to recovery grew from 46% to 69% in 2 years.

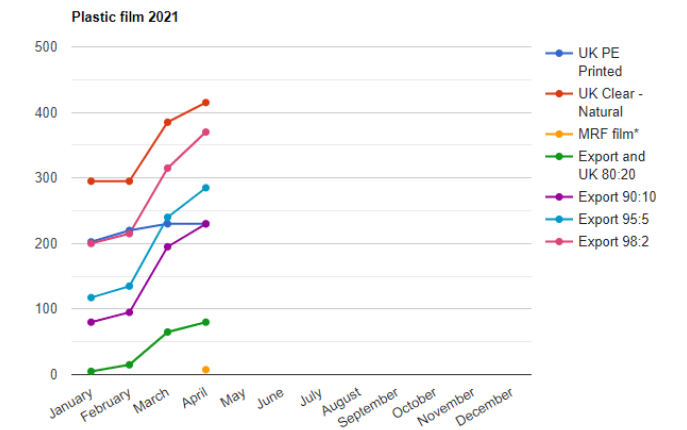
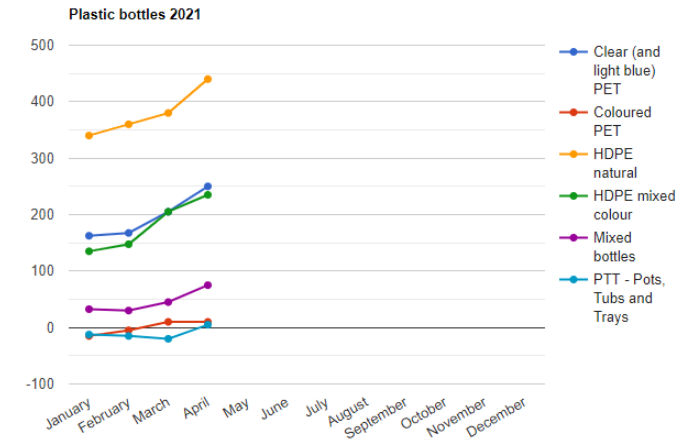
Post separation performance in the Netherlands is evaluated to be – much higher for plastics – than source separation in densely built cities (not necessarily so in low density settlements).



MIXED WASTE SORTING BENEFITS



- Main means to remove as much plastics as possible from incineration
- CO2 benefits - every tonne of plastic incinerated results in about 1.7 tonne of CO2 emissions
- Every tonne of plastic incinerated results in about £100–£400 tonne of lost value from recovered plastic bales (if purified and cleaned sufficiently)
- The investment cost for post-separation recovery plant to unlock this value stream would be quite small at £ 8 million to £40 million of capital investments depending on the size of the facility.



NEXT STEPS



- Evaluations why this is not done in the UK
- Linkage to plastics should not be incinerated
- Potential mixed waste sorting brief

CONTACT INFORMATION



XR Zero Waste is available to discuss the potential in more detail

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