


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

 March 2021

In April 2020, the chair of the North London Waste Authority (NLWA), Cllr Clyde Loakes, stated: ‘We call on Extinction Rebellion to work with the NLWA and the boroughs in areas of common interest, such as the vital practical and campaigning work to reduce waste and increase recycling for the benefit of the planet and future generations.’ In response, XR Zero Waste is pleased to offer Camden Council this 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 2), Camden Council would:

- **SAVE ABOUT £340,000 PER YEAR BY 2030**, as shifting away from waste incineration to achieve 70% recycling would save around £864,000 per year, based on the Council’s own recycling savings estimates,¹ while implementing the action plan would cost the council about £525,000 per year. The net savings translate into a 6% reduction in Camden Council’s £5.7 million waste collection budget.
- **CUT ANNUAL CO₂E 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 shift away from business as usual would allow Camden to **save a total of 154,000 tonnes of CO₂e by 2030**. The council would also save 33,800 tonnes of CO₂ per year by 2030 by obviating 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 arisings and collection of separated valuable resources for re-use 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 legislated 65% target by 2035.² This step is critical because recycling and reuse allow for substantial carbon emission savings by obviating the need for virgin materials. In contrast, both landfilling 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 replacing landfilled and incinerated materials requires more extraction and mining.

The past decade witnessed the diversion of vast amounts of residual waste away from landfill and towards EfW incineration. This decade (2021–30), the direction of travel is towards the circular economy, meaning that waste will need to be: reduced (prevented); diverted away from landfill and EfW incineration; and redirected towards reuse and recycling.

Camden Cllr and NLWA Board member Richard Olaszewski highlighted the advantages of this transition towards the circular economy in June 2020: ‘We do not have an incentive to send waste to an incinerator. It costs us. I remember working with [Cllr] Meric [Apak] to talk about the new waste contract we have in Camden and we were stressing to people all the time, recycle more and you will save the Council money. So let’s focus on how we can make that a practical reality and massively boost our recycling.’

CAMDEN’S WASTE MANAGEMENT TODAY

Despite its growing population, Camden has seen a decline in residual waste arisings (see Figure 1). Since household recycling has also decreased, however, the borough has missed municipal and national recycling targets. Of Camden’s combined household and business waste collected by Veolia and other waste management companies in 2018/2019, an estimated 42.4% was sent to landfill in Buckinghamshire (to Calvert and Bletchley landfills, operated by FCC), 33.3% was sent to the Edmonton incinerator, and only 24.3% was recovered and sent for recycling (see Table 1). Veolia estimates that 85% of the 80,000 tonnes of ‘residual waste’ that Camden sends to the Edmonton incinerator and landfill every year could be recycled.³ At least an additional 4,000 tonnes of recyclable waste are incinerated because of contamination (see Figure 2).

Figure 1 Camden’s residual waste and recycling, collected by Veolia, 2006–18

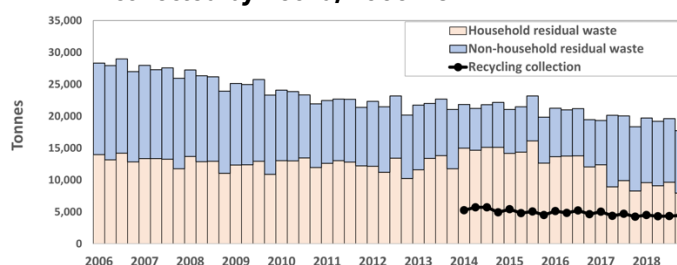


Table 1 Camden’s 2018/19 waste sector performance

Indicator	Performance
Residual waste per household	359 kg/year
LACW ¹ household waste recycling rate	32.7%
LACW C&I ² recycling rate	12.4%
All WMC ³ C&I recycling rate	14.9%
Total recycling rate (household and C&I)	24.3%
Residual waste to energy-from-waste incineration	33.3%
Residual waste to landfill	42.4%

¹ LACW: local authority-collected waste (by Veolia); ² C&I: commercial & industrial waste; ³ WMC: waste management company collection

Table 2 Camden in UK and London waste sector rankings

Indicator	Rank out of 342 UK councils*	Rank out of 32 London councils
Residual waste per household (kg)	30th	2nd
Household waste recycling rate	198th	14th
C&I recycling rate	197th	17th

* Unitary and waste collection authorities for which data is available

Table 3 Action plan for Camden Council⁴

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. ⁵	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. ⁶	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 'prosumers' 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. ⁷	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. ⁸	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. ⁹	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 CO ₂ 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 weekly 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 (rMRF) and other technological innovations	2022/23 No additional costs to Camden Council

CAMDEN'S WASTE MANAGEMENT IN 2030

Since Camden Council's current waste management targets are based on historical trends, achieving them means sticking to business as usual. The Council aims to increase recycling of local authority-collected waste (LACW), as delivered by Veolia, from 24% in 2018/19 to only 26% 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 83,438 tonnes in 2018/19 to 29,078 tonnes in 2030, based on intermediary targets and in line with CCC recommendations.

Figure 2 illustrates the impacts of achieving these more ambitious targets by 2030.¹⁵ By implementing the ten action points, Camden Council would grow organic recycling more than five-fold (via composting and anaerobic digestion) by 2030. Moreover, it would nearly triple the amount of dry recycling, cut waste incineration by 25%, and entirely eliminate

landfilling of residual waste. Notably, the Council would slash greenhouse gas emissions by 73%—by drastically reducing fossil-based CO₂ from incineration and eradicating CO₂ equivalent (CO₂e) emissions from landfill (see Figure 2). For details on the action points, see the notes at the end of this brief.

Key to reducing residual waste, beyond enhancing existing source-separated recycling streams, is introducing a residual material recovery facility (rMRF) for north London, which would extract primarily organic waste and plastics from black bag 'residual waste', resulting in a reduction of at least 40% in residual waste (see Figure 2).

INCINERATION CAPACITY IN 2030

If all seven north London councils were to implement similar action plans, the combined tonnage of residual waste they send to incineration would drop by more than 50%, from almost 465,000 tonnes per year, based on Environment Agency figures, to 205,000 tonnes or less by 2030. The planned, 700,000-tonne incinerator in Edmonton would thus be well over three times larger than required.

In addition to north London's waste, the Edmonton incinerator burns waste from Hertfordshire, whose contract with the NLWA covered the disposal of up to 60,000 tonnes of residual waste per year in 1998–2018. The incinerator was thus burning more than 500,000 tonnes per year.¹⁶ A contract extension for 2021–24 shows that Hertfordshire reduced the amount of waste it sends to the incinerator to 10,000 tonnes.¹⁷ The NLWA's reports provide little clarity on these flows, instead giving the impression that Hertfordshire's incinerated waste comes from north London.¹⁸

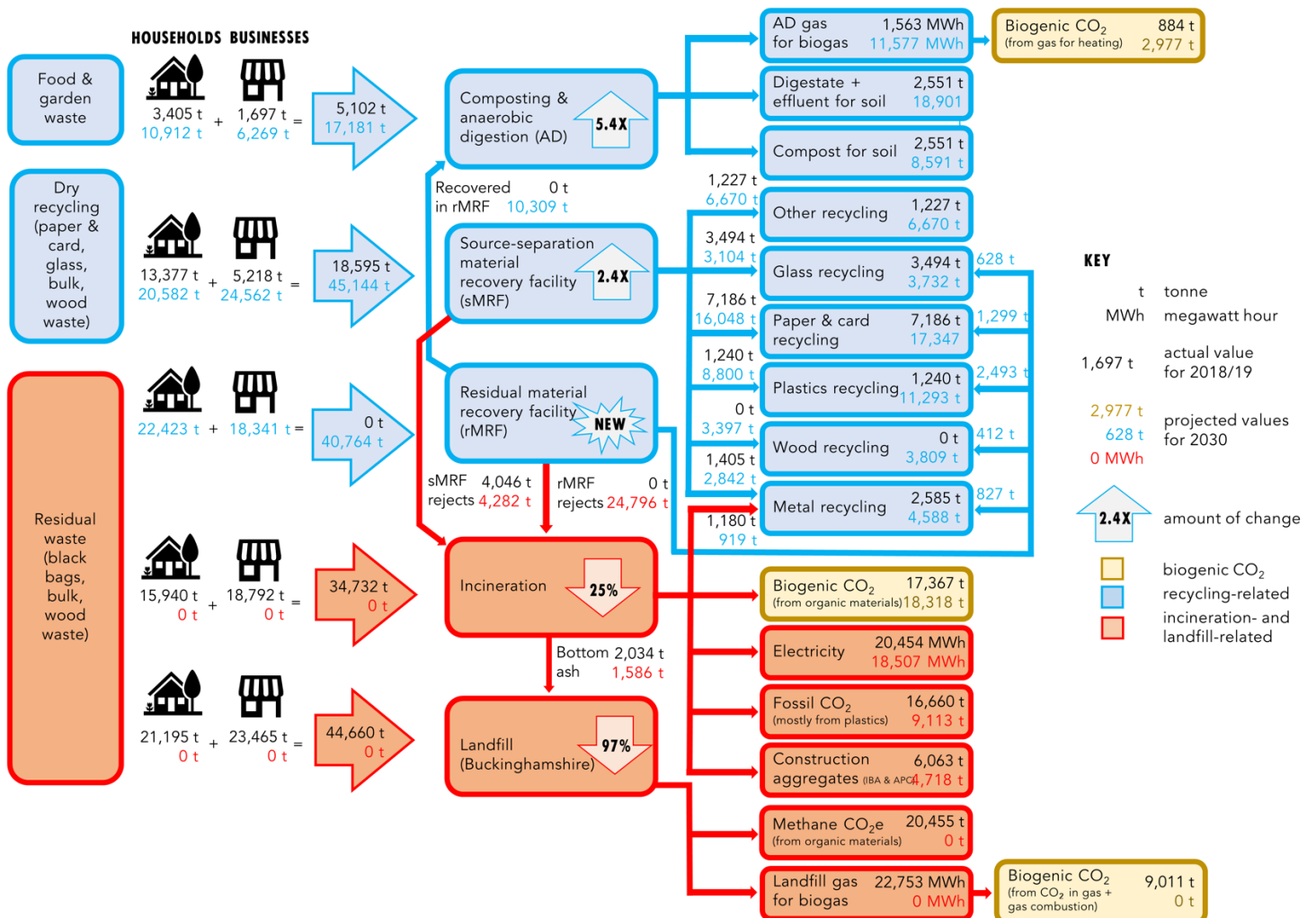
Table 4 Camden's Reduction & Recycling Plan targets

Indicator (December 2019)	2022 target	2025 target
Annual residual waste per household	335 kg	321 kg
Annual household waste recycling rate	35.9%	37.6%
Annual combined LACW recycling rate	25.7%	26.0%

Table 5 Camden's socio-economic statistics

Indicator	Value
Est. population 2015	231,000
Est. population 2019	255,577
Est. number of households (2018/19)	109,040
Number of high tower blocks (≥18 metres)	565

Figure 2 Camden household and business waste flows: actual tonnes for 2018/19 vs. projections for 2030



ABOUT THIS BRIEF

This brief is designed to support Camden Council in developing a workable action plan to achieve waste reduction and recycling goals within its constrained financial means. It presents an overview of the current status of waste management in the borough and proposes steps the Council can take to achieve a recycling rate of 70% and a 65% reduction in residual (black bag) waste arisings by 2030, in line with the national target that DEFRA is expected to introduce under the Environment Bill by 2022.

Achieving these goals requires Camden Council to demonstrate political will, allocate sufficient resources, and monitor progress. Implementation of this plan cannot simply be delegated to Veolia, which, to date, has made limited progress in meeting the recycling targets it is contractually obligated to deliver in Camden.¹⁹

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NOTES WITH DETAILS ON THE ACTION PLAN

¹ Camden Council estimates £30 of cost savings for every tonne diverted from waste incineration or landfill to recycling, as per clause 8.1 in the payment and performance specification of the contract with Veolia (see <https://www.camden.gov.uk/documents/20142/1130362/Environment+Services+-+Veolia+Payment+and+performance+schedule+%5Bpdf%5D.pdf/57af01eb-1b6a-38dc-3d16-139c00f995fa>). Based on that contract, 20% of these savings goes directly to the Council, 40% goes to a joint council-contractor Annual Service Improvement Fund, and 40% goes to Veolia. This arrangement implies that if the council were to divert 48,000 tonnes of residual waste to recovery facilities per year, it would save £1.44 million, £575,900 of which would go to Veolia, £287,950 of which would be available directly to the council, and £575,900 of which would be available via the Annual Service Improvement Fund, which is administered by the council. Such savings could significantly reduce Camden Council's waste management-related expenditure, given the council's 2020/21 waste collection budget of £5.7 million (see <https://www.gov.uk/government/statistics/local-authority-revenue-expenditure-and-financing-england-2020-to-2021-budget-individual-local-authority-data>).

² DEFRA, Circular economy measures drive forward ambitious plans for waste, 20 July 2020, <https://www.gov.uk/government/news/circular-economy-measures-drive-forward-ambitious-plans-for-waste>.

³ Veolia, which collects the majority of Camden's waste, states that 'around 85% of an average bin in Camden can be recycled'. Veolia, Delivering street cleansing, recycling and waste services for Camden residents, n.d., <https://www.veolia.co.uk/london/camden>.

⁴ Cost estimates are for Camden Council only, assuming investment of in-house resources in line with the required ambition; resident engagement; and continuous monitoring of progress against action plan targets. Costs to other parties are excluded.

⁵ **ACTION POINT 1: Residual waste and recycling heat maps.** Camden Council's Environment Services Contract already requires Veolia to provide a management information system that 'includes "live" interactive dashboards to monitor service delivery and report on contractual performance' (clause 6.2.3) and that 'takes full advantage of innovation and new technologies, the development

REFERENCES

Camden Council, London Borough of Camden Reduction and Recycling Plan: 2018–2022, December 2019, <https://www.camden.gov.uk/documents/20142/1130362/Camden+RRP.pdf/206eebc6-7082-7214-9275-039d70aaedae?t=1594829729516>.

DEFRA, WasteDataFlow, 2020, <https://www.wastedata-flow.org/>.

Environment Agency, Waste Data Interrogator 2018, last updated 29 September 2020, <https://data.gov.uk/dataset/312ace0a-ff0a-4f6f-a7ea-f757164cc488/waste-data-interrogator-2018>.

WRAP and Eunomia, Quantifying the national composition of municipal waste, 2020, <https://wrap.org.uk/content/quantifying-composition-municipal-waste>.

of new interfaces and software upgrades and regular enhancements during the Contract Period' (clause 6.2.4).

Accordingly, Veolia has introduced a visualisation dashboard using the Microsoft Power BI tool for business analytics, which provides the council with insight at the ward level. Veolia should be able to upgrade the system to provide more fine-grained heat mapping under the current contract. For details, see the contract at <https://www.camden.gov.uk/documents/20142/1130362/Environment+Services+-+Veolia+-+Service+specification+%5Bpdf%5D.pdf/499f2011-74cb-58c4-d227-ec45f08998b8>. For details on Veolia's current dashboard, see <https://www.camden.gov.uk/documents/20142/1130362/Annual+Service+Report+2018-19.PDF/22a69c1f-07ef-00d3-c0f2-37d7b604ae6f?t=1606991137637>.

To enable the dashboard interface to provide detailed, continually updated heat maps of the state of recycling in each north London borough, the NLWA and its seven constituent councils—together with a software company—could develop a suitable application. The following options may be appropriate:

- A heat map application could be integrated into Enviroweigh, the bin weighing software system developed by VWS and used by the majority of refuse and recycling collection trucks in the UK (see <https://www.vwsitd.co.uk/waste-management>). Via the VWS live web portal, the system provides accurate, real-time information on the weight of bins loaded onto trucks.
- A complementary option is to develop a new spatial mapping application that allows monitoring experts to enter the number, type, and quality of collected bags and bins for individual households.

⁶ **ACTION POINT 2: Business recycling programme.** The development of heat maps that show street-level details—as proposed under action point 1—would clarify where businesses are most in need of recycling, allow for the monitoring and evaluation of a business programme, and determine whether certificates awarded following training remain valid based on annual changes in the recycling rate.

⁷ **ACTION POINT 3: Prosumer network to support business recycling.** Prosumers can apply soft pressure on small and large businesses by empowering their customers to demand organic and dry recycling.

While a significant number of people may support such actions, they may not become actively involved unless they join a network of individuals who are unified behind the goal of improving business recycling. The 2020 Viridor Recycling Index showed that 60% of UK consumers polled said businesses (among other actors) should be responsible for recycling, up from 49% in 2019 (see <https://www.viridor.co.uk/siteassets/document-repository/recycling-index/uk-recycling-index-2020.pdf>).

Prosumers can be active in a variety of ways, such as by asking businesses about their recycling when they purchase items; returning or leaving packaging in stores; praising or naming and shaming businesses on social media; urging businesses to provide free water taps for customers; and encouraging businesses to use substitutes for single-use items. Such soft pressure could bump up the proportion of UK coffee shops and outlets that offer coffee cup recycling (estimated at 36% in 2020), even if only a small number of customers become prosumers (for coffee cup recycling information, see <https://www.citytosea.org.uk/wp-content/uploads/2020/11/Food-To-Go-Report-City-to-Sea-2020.pdf>).

Camden Council could support a prosumer network. Such a network could also benefit from advice from action-oriented organisations in the borough, such as the Camden Climate Change Alliance (see <https://www.camdencca.org/camden-recycles-cups/>), as well as national groups such as City to Sea (see <https://www.citytosea.org.uk/>) and Hubbub (see <https://www.hubbub.org.uk/>).

8 ACTION POINT 4: Recycling bins and bin areas. As a contractor, Veolia is currently responsible for maintaining a stock system for all waste containers and carrying out routine maintenance, yet there is no formal requirement in the contract for replacing missing lids or damaged signage. Nor is there a requirement for reporting to the council about the quality status of containers. These omissions could easily be rectified through amendments to the current contract or updating when possible. See the contract at <https://www.camden.gov.uk/documents/20142/1130362/Environment+Services+-+Veolia+-+Service+specification+%5Bpdf%5D.pdf/499f2011-74cb-58c4-d227-ec45f08998b8>.

Camden Council could address shortcomings in the contract by requiring the company to carry out and report on annual checks of all recycling bins and bin areas, to ensure that the highest standards are maintained and that any damage is fixed. Such checks would ensure the best possible recycling experience for residents and businesses, while helping to identify service gaps at least once per year, so that these are addressed.

The costs for fixing or replacing damaged containers and signage in the current contract with Veolia fall to Camden, which is responsible for the upkeep of containers and the purchase of new containers if old ones have been lost or damaged. The council successfully applied to the Borough Recycling Fund, which is jointly run by the NLWA and Biffa; it secured funding for new recycling bin lids and improved signage. While this effort is commendable, it should be continuous rather than a one-off event. For details, see <https://www.nlwa.gov.uk/news/north-london-benefit-new-borough-recycling-fund>.

A growing body of literature and case studies underscores the importance of bin upkeep to recycling. The availability of quality bins with clean labels and clear messaging has been shown to influence people's recycling efforts in behavioural studies. Indeed, bin colour, signage, and shapes can affect recycling rates (see https://www.ecosurety.com/media/708806/second_lbe_report_dec_2019_digital.pdf and <https://www.circulononline.co.uk/news/simply-changing-the-colour-of-bins-can-increase-recycling/>). Moreover, bin design—including of lids and insert slots—affects contamination rates (see <https://www.sciencedirect.com/science/article/abs/pii/S0956053X1930368X> and <https://www.mdpi.com/2071-1050/10/4/1240/htm>).

In this context, a good starting point is the Flats Recycling Package, designed by Resource London (see <https://resource-london.org/resource-london-research-finds-common-sense-solutions-improve-recycling-rates-in-flats-by-a-quarter/>). This pilot project, in which Camden participated, showed that recycling rates increase in boroughs that have:

- clean, well-maintained bins and bin areas;
- adequate collections to stop overflows, and enough recycling capacity (a minimum of 60 litres per household per week);
- recycling bin apertures big enough to accept plastic recycling bags;
- bins with locked reverse-opening lids;

- collection of the six main recyclable materials;
- clear and visible signage on and above the bins;
- recycling bins conveniently located for residents;
- recycling leaflets sent to residents once a year;
- posters highlighting recycling messages displayed in a central location (if possible);
- clear information for residents about what they should do with large items (such as fridges and sofas);
- additional small recycling bins in convenient locations, to make it easier for residents to recycle;
- emotive signage on or around residual waste bins;
- feedback posters announcing local news and recycling information, changed regularly to catch residents' attention; and
- in-home storage solutions—packs of plastic bags and hooks for storing recycling at home, with additional bags available from dispensers near entrances to each block.

9 ACTION POINT 5: Bulk waste collections. While 62% of waste electronic and electrical equipment (WEEE) is recycled in England, the collection and recycling of other bulk waste items is abysmal. WRAP and Eunomia show that less than 3% of furniture and similar items are recycled, for instance (see <https://wrap.org.uk/sites/files/wrap/National%20household%20waste%20composition%202017.pdf>).

Camden Council runs one reuse and recycling centre, on Regis Road, where residents can donate bulk waste. The centre brings in an estimated annual profit of £5,000 (see <http://westminsterextra.com/article/public-misled-over-charity-donations-at-recycling-centre-which-turned-up-in-second-hand-shop>). The council also runs a bulk waste collection service, with fees set at £25 for 1–5 items, £50 for 6–10 items, £75 for 11–15 items, and £10 for 1–2 large electrical items (see <https://www.camden.gov.uk/bulky-waste-collection>). To facilitate bulk waste collections, Camden could pilot new approaches such as free collections per street or street segment, including by:

- distributing flyers to all addresses on a particular street or street segment during a regular refuse and recycling collection, to announce that free bulk waste collection is planned for that street on a specified day the following week. As announced, a truck could then collect the bulk, such as old furniture, mattresses, and appliances.
- distributing flyers during a regular refuse and recycling collection to about 50 addresses in any street where a resident has called the council to book a one-off bulk waste collection, so as to alert residents that a bulk waste collection is planned and that they can deposit their bulk waste free of charge. This approach can improve collection efficiency, since a truck will already make the bulk round.
- upgrading bin areas by flats and community spaces where residents dump bulk waste instead of availing themselves of proper collections. In bin areas with additional space, dry, lockable bulk waste lots could be set up, with clear signage and instructions notifying residents that bulk waste will be collected at least once per year free of charge. A lot can be locked once it is full. Once a number of lots are full in a particular area, a truck can be sent to pick up the waste efficiently.

Bulk waste collection points. In addition to improving collection options, Camden Council could establish a network of at least ten secure, movable bulk waste donation points across the borough, to give residents more options to drop off furniture, appliances, and mattresses. Ideally, these points could be emptied regularly by partner organisations and companies, which could include:

- Bright Sparks (<https://brightsparksonline.com/>);
- CollectYourOldBed.com (<https://www.collectyouroldbed.com/>);
- Groundwork (<https://www.groundwork.org.uk/projects/the-loops/>);
- the London Community Resource Network (<http://lcn.org.uk/>);
- the Reuse Network (<https://reuse-network.org.uk/>); and
- Second Time Around (<https://secondtimearound.london/>).

A bulk waste collection point can consist of a clearly labelled, easy-to-install, movable 4m x 3m flat-pack container, available for less than £4,000 (see <https://www.portablespace.co.uk/>). Such containers are easy to open, close, and lock, which helps ensure they are only accessible during the day. Bulk waste donation and collection dates and locations can be announced in advance to ensure related activities can be managed effectively.

Together with partner organisations, Camden Council could also set up reuse hubs, where collected items can be refurbished and resold, in addition to the Regis Road Reuse and Recycling Centre. In terms of upgrading and reselling collected items, the council could benefit from working with Groundwork, which has established award-winning reuse hubs in Hackney and Barnet (see <https://www.groundwork.org.uk/projects/the-loops/>).

10 ACTION POINT 6: Camden Council's website. Camden Council provides clear—if minimal and relatively dry—information on its 'What goes in my bin?' page (see <https://www.camden.gov.uk/what-goes-in-bins>). The page is not visually compelling, nor does it offer an engaging narrative. Additional information is spread across many other pages, meaning that only a very small number of highly motivated residents are likely to read all the relevant details or find what they might be looking for.

Camden Council has produced more effective and visually appealing materials on waste, including on pages 24–25 in the November 2018 issue of *Camden Magazine* (see https://issuu.com/camdenmagazine/docs/camden_magazine_nov_2018_web/2). Such reader-friendly texts and illustrations could be featured on the council's website to make it more appealing to residents.

The website could also be amended to offer information about recycling labels on packaging, which is currently missing, and more details on contaminants and how to prevent contamination of recyclables. The website could also provide rules of thumb for what borderline items can and cannot be recycled. Such guidance would ensure that residents avoid guessing or assuming they know what to do although they do not. Keep Britain Tidy's 2020 study *Inside the Head of the Contaminator* shows that people's own incorrect rules of thumb regarding what can and cannot be recycled are a major factor in waste contamination (see <https://www.keepbritaintidy.org/sites/default/files/resources/Inside%20the%20Head%20of%20the%20Contaminator%20-%20Research%20Report%202020.pdf>).

Awareness raising and behaviour change campaigns. Passive information gathering among residents is insufficient for reaching recycling and residual waste reduction targets. By engaging in consistent, high-quality, active communication with residents, Camden Council can help improve reuse and recycling behaviour. Awareness raising and behaviour change campaigns can be effective means of reaching populations, especially if they are co-created with community organisations and high-footfall businesses.

The nominees for the National Recycling Awards organised by Materials Recycling World can provide inspiration for campaigns (see <https://nra.mrw.co.uk/shortlist-2020>). In north London, relevant campaigns and activities currently include the Waste Warriors Workshops in schools in Enfield and Barnet. Funded by the NLWA, this project could easily be extended to Camden (see <http://www.breadnbutter.org.uk/waste-warriors/>).

Targeted doorstepping. Once COVID-19 restrictions are lifted, doorstepping will be a key instrument for improving recycling behaviour and supporting residents, especially in combination with heat maps that highlight which streets, flats, and households have the lowest recycling rates and need to be prioritised. In Croydon, doorstepping awareness campaigns with targeted flyers and outreach efforts led to a 10% upswing in the recycling rate (see <https://www.keepbritaintidy.org/sites/default/files/resource/CIWM%20August%202018%2033.pdf>).

11 ACTION POINT 7: Food waste preventing and collection. In 2016–17, together with the West London Waste Authority, Keep Britain Tidy implemented a food waste recycling programme that led to a 24% average increase in food waste collected per

household per week (see <https://www.keepbritaintidy.org/news/how-we-increased-food-waste-recycling-38-west-london-and-how-we-can-help-you-too>). The programme entailed the application of 'no food waste, please' stickers on general waste wheelie bins; the distribution of leaflets on food waste recycling for local households; the provision of free food waste caddies; and a six-month supply of food waste caddy liners, followed by a second batch for the following six months. Such initiatives can offer valuable lessons for improving Camden's food waste collection.

Zero food waste training. The NLWA offers households a number of useful resources to support food waste reduction, including webinars, short videos, a cookbook, and workshop materials (see <https://www.nlwa.gov.uk/campaigns-and-projects/save-crust>, <https://www.nlwa.gov.uk/reducereuserecycle/recycle/food-waste-recycling>, and <https://www.youtube.com/channel/UCZWPtRqS3KwBtqu4Uxn2D5w/playlists>). Based on the number of online views and workshops organised, however, it is clear that few residents have been exposed to these resources.

To be able to reach Camden-based businesses and at least 5% of the borough's households (or 5,000 residents), the council could allocate enough funds to organise 100 or more zero food waste workshops per year and conduct related outreach. The workshops could draw on the NLWA's materials as well as the following resources:

- Groundwork's Small Change, Big Difference campaign (see <http://smallchangebigdifference.london/>);
- an online course on tackling food waste from the University of Reading (see <https://www.futurelearn.com/courses/from-waste-to-value>);
- WRAP's UK-wide Love Food Hate Waste campaign (see <https://www.lovefoodhatewaste.com/>); and
- WRAP's free zero food waste course for food businesses (see <https://www.sustainabilityexchange.ac.uk/wrap-on-course-for-zero-waste>).

Financial savings and cuts in CO₂ emissions. Camden Council's website offers a bare minimum of information on food waste recycling, and none at all on the associated financial benefits or CO₂ savings (see <https://www.camden.gov.uk/recycling-your-food-waste>). Such information could incentivise residents to limit food waste, however. The average annual cost of food waste is estimated at £470 per household and £700 per household with children (see <https://www.bbc.co.uk/news/science-environment-39747327#:~:text=Food%20waste%20costs%20the%20average,lost%20%C2%A3700%2C%20it%20said>). Meanwhile, each tonne of food waste that is prevented saves an estimated 3.7 tonnes of CO₂ (see <https://www.xrzerowaste.uk/annex-1> and <http://www.eunomia.co.uk/wp-content/uploads/2015/11/Technical-Appendices-FN-1.pdf>). The total avoidable food waste in Camden is estimated at 77 kg per person per year (see <https://www.camden.gov.uk/documents/20142/1130362/Camden+RRP.pdf/206eebc6-7082-7214-9275-039d70aaedae?t=1594829729516>).

Food waste preventions apps. Various apps are available to help people and restaurants reduce their food waste; support the donation of food and the gifting and resale of leftover meals; scan food barcodes; and remind users of expiration dates. Among these apps are FoodCloud, Karma, No Waste, Olio, and Too Good to Go (see <https://inews.co.uk/inews-lifestyle/food-and-drink/apps-food-waste-olio-karma-too-good-to-go-306025>).

12 ACTION POINT 8: Welsh Collections Blueprint. The key driver behind Wales's achievement of a 65% recycling rate in 2020 was the Welsh Collections Blueprint of 2011, which has been adopted by a growing number of Welsh councils (see <http://www.wrapcymru.org.uk/sites/files/wrap/Municipal%20Sector%20Plan%20Wales%20-%20Collections%20Blueprint.pdf>). In planning to shift towards enhanced recycling collections and processing, Camden Council may wish to evaluate the costs and benefits of implementing the Blueprint actions, which appear as follows on pages 8–14 in the 2011 document (CA=civic amenity; HWRC= household waste recycling centre; WEEE=waste electronic and electrical equipment):

- Reduced residual waste container capacity – for example the use of 140 litre instead of 240 litre wheeled bins, or restriction on the number of bags that can be put out.
- Reduced residual waste collection frequency – once a fortnight is sufficient (when weekly food waste collection is provided).
- No “side waste” collected for residual waste.
- Promotion of, and support for, home composting/ treatment for garden waste.
- Apply charging for green waste collection (as allowed under the Controlled Waste Regulations 1994), and collecting it only once a fortnight.
- Separate weekly food waste collection (not comingled with green waste).
- Run the bulky waste collection service as a bulky reuse and recycling collection service.
- Provision of at least one local centre (e.g. civic amenity site / household) waste recycling centre that can receive and safely store bulky items for reuse.
- Weekly collection of dry recyclables mixed together in a box, with two or more boxes provided per household. Recyclables separated at the kerbside. Termed a “kerbside sort” system
- Food waste collected separately once a week, preferably through the use of kitchen caddies (with provision of free compostable liners), and separate lockable kerbside collection containers. Allow inclusion of paper kitchen towels and tissues.
- Use of modern lightweight, multicompartment vehicles (8 tonnes plus 4 tonne payload) for a single pass collection of dry recyclables and food waste. Ideally using renewable fuel.
- The following recyclable materials to be collected as a minimum in the kerbside sort system (or perhaps via a dense bring site system): By 2012-13: Paper; cardboard; plastic bottles, pots, tubs and trays; metal cans and small scrap (e.g. kitchen utensils), foil; glass jars and bottles
- Full recording and reporting to the public of the end destination and use of recycle.
- Achieve a level of at least 80% recycling at all civic amenity / household waste recycling centres
- At least one CA/HWRC site to have facilities to receive and store separately: glass, metals, paper, cardboard, wood, green/garden, plastic, textiles, mineral oil, vegetable oil, glycerol, WEEE, fluorescent light bulbs/tubes, paints/ solvents/ other hazardous household waste, aggregate, soils, bonded asbestos, and items that can be re-used. This list is not exhaustive.
- CA site density to reflect the needs of local residents and be consistent with the Collections, Infrastructure and Markets Sector Plan.
- Bring site density to reflect the needs of local residents and be consistent with the Collections, Infrastructure and Markets Sector Plan
- Recycling collection service offered to businesses, for at least paper, plastic, metal, glass and food waste.
- Green waste sent to PAS100 and Quality Protocol compliant composting plants.
- Food waste sent to PAS110 and Quality Protocol compliant anaerobic digestion plants.
- <30% of all Local Authority Collected Municipal Waste to be residual waste sent to a high energy efficiency energy from waste (EfW) plant.
- Processed EfW bottom ash recycled to produce a product that meets a relevant Quality Protocol or End of Waste Criteria.

¹³ **ACTION POINT 9: Specialised recycling collections and infrastructure.** Camden Council can work with the NLWA, GLA, and industry on specialised recycling collections for particular items, while taking advantage of relevant industry recycling agreements. A not-for-profit called Podback, for example, manages a national recycling scheme for used coffee pods (see <https://www.theguardian.com/business/2020/nov/20/nestle-first-uk-wide-coffee-pod-recycling-scheme>). In Camden, LondonEnergy already has a specialised coffee cup collection scheme for businesses (see <https://www.londonenergy.com/londonenergy-offers-camden-council-a-coffee-cup-recycling-solution/>). These schemes can be offered as part of current bulk waste collections, or as separate weekly collection schemes with dedicated item banks. For some items, recycling options exist but are not employed, typically

because of a lack of investment in infrastructure or specialised collections. Such is the case for the following items:

Textiles. Despite the establishment of significant textile collection infrastructure, there is limited to no recycling infrastructure in the UK. The vast majority of collected clothes not resold in the UK are dumped in low-income countries, while a smaller portion is recycled in Italy (<https://www.youtube.com/watch?v=7i0QMnz4EXY>). Nevertheless, a growing number of councils are offering textile and footwear collection bags and services to residents. In London, for example, Hillingdon Council offers purple bags for textile collections (see <https://www.hillingdon.gov.uk/article/2329/Textile-collection-service>). Camden Council could work with textile collection charities such as Islamic Relief, Oxfam, and Traid to offer similar collection and donation services. Separately, innovative technologies can be brought to the UK to encourage domestic recycling, in cooperation with the textile industry and UK groups such as the Textile Recycling Association (see <https://www.textile-recycling.org.uk/>). Two key innovations include H&M’s Green Machine, which separates and recycles cotton and polyester blends into new fibres and cellulose powder (see <https://hmfoundation.com/project/recycling-the-green-machine/>), and Fibersort, which offers automated sorting of used clothes by fibre type (see <https://smartfibersorting.com/>).

Footwear. Throughout the UK, footwear collection and recycling infrastructure is limited. Recycling is currently organized around collection points, such as those managed by recycling company SOEX. Runners Need, a supplier of running shoes that was founded in Camden, has partnered with SOEX, which separates out reusable and refurbishable shoes and sends recyclable footwear to dedicated recycling facilities in Germany (see <https://www.runnersneed.com/about-us/recyclemyrun.html>). The United Shoe Recycling Company also collects footwear from its banks, which comprise dedicated shoe containers as well as banks for textiles and shoes (see <http://www.unitedshoe.co.uk/>). Specialised footwear collections, carried out alongside textile collections, help to improve the separation and recycling of footwear.

Carpets. A negligible number of carpets are reused and recycled in the UK. One challenge is the lack of legal instruments, another is the limited ambition of the carpet industry. The trade body Carpet Recycling UK concentrates on averting landfill while promoting the collection and incineration of carpets, far more so than material recovery and reuse (see <https://carpetrecyclinguk.com/>). The benefits of carpet reuse and recycling can be significant: in one case study in West London, recycling carpets led to a 14% drop in waste disposal costs (see <https://carpetrecyclinguk.com/wp-content/uploads/2018/10/carpet-recycling-in-West-London-case-study-1.pdf>). Office carpets are the focus of Envirocycle London, which collects carpet tiles that are then cleaned, refurbished for reuse (as far as possible), and sold online (see <https://envirocyclelondon.com/>). Camden Council could promote such carpet reuse by supporting a dedicated collection scheme. When it comes to recycling old carpets, the US company Circular Polymers has developed innovative technology and has worked with the materials company Eastman to establish recycling facilities abroad (see <https://circularpolymers.com/process/>). While no such facilities are yet in place in the UK, Camden Council—together with other councils and the NLWA—could run feasibility studies to evaluate options for domestic carpet recycling, in cooperation with Carpet Recycling UK and companies that focus on establishing recycling facilities in the UK, such as Innovate Recycle (see <https://innovaterecycle.co.uk/>).

Nappies. The NLWA states that in north London hundreds of lorry loads of recycling are rejected annually due to nappy contamination (see <https://www.energylivenews.com/2019/07/04/north-london-nappies-significantly-hindering-recycling-efforts/>). In the UK, seven Welsh councils are currently the only ones that properly recycle nappies. They use NappiCycle, which recovers cellulose fibre from nappies and separates it into paper and plastic components; in turn, these components can be recycled into cardboard, a cellulose fibre-enforced plastic board, and pellets for fuel (see <http://nappicycle.co.uk/innovations/>). NappiCycle technology could also be deployed in north London.

Table 6 Recovery values attained for residual MRF facilities

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>

Material recovery facility (MRF) technology. New technology for better separation of collected recycling is continuously under development. Key current technology includes picking robots that capture particular items in the recycling stream and can work alongside human pickers. Firms such as ZenRobotics in Finland (see <https://zenrobotics.com/>) and Machinex in the United States (see <https://www.machinexrecycling.com/samurai/>) have developed sorting robots that can use machine learning to recognise and pick out specified materials on a conveyor belt with a high degree of precision. The Machinex technology is being installed at a MRF in Coventry (see <https://www.letsrecycle.com/news/latest-news/coventry-mrf-to-feature-artificial-intelligence/>).

Emerging MRF technologies include digital watermarking on packaging for machine recognition, which is being piloted in the HolyGrail project, supported by 85 companies and organisations (see <https://packagingeurope.com/holy-grail-enters-next-stage-with-cross-industry-backing/>). The technology works with Tomra Autosort scanning equipment, which is already in use in Biffa's MRFs, including the one in Edmonton.

Innovative recycling technology. Among other key advances, Veolia—together with Charpak, HSSMI, and Unilever—is developing the UK's first dual PET bottle and tray recycling facility for closed-loop PET recycling (see <https://www.ukri.org/news/ukri-funding-puts-uk-at-the-forefront-of-plastic-recycling/>).

¹⁵ For comparative purposes, the calculations assume that total waste arisings will remain similar, even though local authority-collected residual waste and recycling have actually been declining (see Figure 1). As a result, the waste arisings projected in Figure 2 are probably overestimated.

¹⁶ Hertfordshire County Council, Expression of Interest for PFI credits, 2008, <https://www.hertfordshire.gov.uk/media-library/documents/environment-and-planning/waste-and-recycling/expression-of-interest-for-pfi-credits.pdf>.

¹⁷ Hertfordshire County Council, Community Safety & Waste Management Panel, 2019, <https://democracy.hertfordshire.gov.uk/documents/s8897/03%20Item%203%20Variation%20to%20the%20Residual%20Waste%20Treatment%20Contract.pdf>.

¹⁸ The NLWA's annual reports and strategy monitoring reports aggregate all waste flows and do not transparently list the amounts of waste that are recycled, landfilled, and incinerated per borough. See <https://www.nlwa.gov.uk/ourauthority/our-reports>.

¹⁹ Veolia's eight-year contract with Camden Council stipulates a recycling target of 33% for Year 1 (2017/18), 38% for Year 4 (2020/21), and 40% for Year 8 (2024/25). See Camden Council, Environment Services Contract—Schedule 4: Payment and Performance, [https://www.camden.gov.uk/documents/20142/1130362/Environment+Services+-+Veolia+-+Payment+and+performance+schedule+\[pdf\].pdf/57af01eb-1b6a-38dc-3d16-139c00f995fa](https://www.camden.gov.uk/documents/20142/1130362/Environment+Services+-+Veolia+-+Payment+and+performance+schedule+[pdf].pdf/57af01eb-1b6a-38dc-3d16-139c00f995fa). Annual Service Reviews are available at <https://www.camden.gov.uk/our-environment-services-priorities-and-contract-documents>.

Mattresses. About eight large mattress recyclers operate in the UK; an estimated 1.4 million mattresses are recycled each year (see <https://www.bedfed.org.uk/wp-content/uploads/Mattress-Component-Recycling-Report-2018.pdf>). Camden Council could work with collection services such as CollectYourOldBed.com (see <https://www.collectyouroldbed.com/>) by linking them to bulk waste collection services. The council and the NLWA could consider establishing a mattress recycling facility in north London.

Crisp packets. Only specialised facilities can recycle crisp packets, as they are made of metallised plastic film. Together with TerraCycle, Walkers offers a crisp packet recycling scheme with drop-off points; however, there is not a single drop-off point in Camden (see <https://www.terracycle.com/en-GB/brigades/crisppacket>). As a starting point, Camden Council could ensure that a crisp packet drop-off point be integrated in the Regis Road Reuse and Recycling Centre. It could also back the establishment of drop-off points at community centres, faith centres, and schools. To participate, a drop-off location needs to collect 1,600 crisp packets every six months. In north London current drop-off locations include the New North London Synagogue, Chestnuts Primary School in Haringey, and Earlsmead primary school in Tottenham.

Cat litter. Cat litter can be made of a wide range of materials besides the common clay-based granules, including silica gels, pine, recycled paper granules, grass-based materials, and sawdust. Organic recycling of litter is difficult because of the variety of materials, additives in the clay, and the presence of faecal matter. A two-pronged approach is required to improve cat litter recycling: greater support for a shift towards industrial composting and awareness raising to encourage cat owners to use certified biodegradable and compostable cat litter (such as ASTM D6400 for compostability, OECD 301 for biodegradability, or similar British Standards Institute certification). Such litter can be included for specialised collection or with garden waste for organic recycling.

¹⁴ **ACTION POINT 10: Recovery and recycling technology.** The NLWA indicates that neither hard (or dense) plastic nor expanded polystyrene is currently recycled in north London (see <https://www.nlwa.gov.uk/reducereuserecycle/recycle/whatcanwecycle/hard-plastic> and <https://www.nlwa.gov.uk/reducereuserecycle/recycle/whatcanwecycle/expanded-polystyrene>). These materials account for a significant portion of people's waste, yet although both are easily recyclable, the current economics of recycling prevent them from being recovered for use. The closest facility that can accept expanded polystyrene is in Northampton (see http://www.eps.co.uk/sustainability/eps_recyclers.html). The situation is likely to change soon, however, as a new plastic packaging tax is to be introduced in April 2022. As of then, manufacturers will be charged £200 per tonne of packaging that contains less than 30% recycled content. The tax, which is expected to produce an overall shift in market pricing of recycled plastics, will make collection and recycling of the majority of plastics highly attractive.

Residual material recovery facilities. One way the NLWA could rapidly increase the amount of plastic it recycles is to invest in a residual material recovery facility (rMRF), one step up from the source-separation MRF (sMRF), also known as 'dirty' MRF (pronounced 'murf'). rMRFs recover primarily plastics and metals from residual waste; more advanced facilities also offer pre-treatment options to remove food waste from the residual waste stream prior to anaerobic digestion. rMRFs are designed to increase recycling rates by complementing—not by replacing—commingled, single- or multi-stream separation at kerbside and 'dirty' MRF processing. At Bargeddie in Scotland, for example, Viridor opened an rMRF in 2020 to process 190,000 tonnes of residual waste from seven local authorities (see <https://www.viridor.co.uk/who-we-are/latest-news/2020-news/household-waste-at-viridor-bargeddie/>).

Substantial data on the efficacy of such facilities is available from the Netherlands, where six modern rMRFs currently process more than 2 million tonnes of residual waste (see <https://www.enschede.nl/sites/default/files/Toekomstscenario%27s%20Afvalbeheer%20Enschede%2025juni2018v7%5B1%5D.pdf>). In 2019, the two longest-running facilities in the Netherlands, operated by Omrin and Attero, had a recovery efficacy of 40%–60% (see Table 6).