

Squaring the Circular Economy: How the UK Disproportionately Tasks Households with Meeting Targets for Plastic Recycling

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Abstract

The United Kingdom has a plastic problem. In 2016, Britons produced more plastic waste per capita than the citizens of any other country, bar the United States.¹ It is for this reason that the UK has continued to adhere to the European Union's targets for recovery and recycling of plastic, despite leaving the EU in 2020.² The EU's broad objective is for member states to achieve what is known as a circular economy, wherein plastic is collected and reused indefinitely.

In order to achieve a circular economy, the UK sets recycling targets for both households and businesses. The legislation governing how local authorities and private citizens are expected to handle their waste differs significantly from legislation applied to their commercial counterparts. The UK maintains a blanket target of achieving a 65% municipal recycling rate by 2035.³ This is despite the fact the majority of plastic discarded as household waste is created commercially.

This article considers whether the targets the UK sets are fair and proportionate in the context of the realities of both sectors. It will then question if public policy surrounding how recycling is conducted is sufficiently robust enough to achieve the government's targets.

Keywords: Plastic; Recycling; Municipal Waste; Circular Economy

¹ Kara Law and others, 'The United States' Contribution of Plastic Waste to Land and Ocean' (2020) 6(44) *Science Advances*.

² European Union (Withdrawal Agreement) Act 2020.

³ Department for Food, Environment and Rural Affairs, 'Our Waste, Our Resources: a Strategy for England' (DEFRA, 18 December 2018) 67

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf> accessed 29 July 2021.

1. Introduction

Since chemist Leo Baekeland developed the first commercial plastic in 1907,⁴ plastic has become a cornerstone of manufacturing. It constitutes everything from medical equipment to food packaging, boasting malleability and resistance to rot.

Today, an estimated “60% of all plastics ever produced” are now in “landfills or... the natural environment” with none biodegrading in “any meaningful way”.⁵ This particularly affects ocean organisms, which often results in “harm or death”.⁶ Plastic also impacts humans who ingest fragments via “food with trace amounts of... packaging”.⁷ Despite research gaps on health consequences,⁸ it is understood that plastic can contain carcinogenic elements such as lead or mercury.⁹

Recycling plays a part in limiting how much plastic enters the ecosystem. Recycling also preserves finite resources including petroleum, because “nearly every piece of plastic begins as a fossil fuel”.¹⁰ Managing plastic waste has subsequently become a matter of public policy.

The UK has ample reason to be concerned. In 2016, Britons produced more plastic waste per capita than any other country bar the United States.¹¹ The Department for Environment, Food and Rural Affairs (DEFRA) estimates that the UK annually uses five million tonnes of plastic, “nearly half of which is packaging”.¹² To manage plastic waste, the UK has adopted the EU’s objective of a “circular economy”—a theoretical cycle of recycling plastic indefinitely.¹³ The UK mandates recycling efforts from

⁴ Jeffrey Meikle, *American Plastic: A Cultural History* (1st edn, Rutgers University Press 1995) 33.

⁵ Roland Geyer, Jenna Jambeck and Kara Law, ‘Production, Use, and Fate of All Plastics Ever Made’ (2017) 3(7) *Science Advances*.

⁶ Sarah Gall and Richard Thompson, ‘The Impact of Debris on Marine Life’ (2015) 92 *Marine Pollution Bulletin* 170.

⁷ Sarah Gibbens, ‘You Eat Thousands of Bits of Plastic Every Year’ *National Geographic* (6 June 2019) <<https://www.nationalgeographic.co.uk/environment/2019/06/you-eat-thousands-bits-plastic-every-year>> accessed 29 July 2021.

⁸ Eddy Zeng, *Microplastic Contamination in Aquatic Environments: An Emerging Matter of Environmental Urgency* (1st edn, Elsevier Science 2018) 125.

⁹ Armen Nersesyan and others, ‘Results of Micronucleus Assays with Individuals Who Are Occupationally and Environmentally Exposed to Mercury, Lead and Cadmium’ (2016) 770 *Mutation Research* 119.

¹⁰ Lisa Anne Hamilton and others, ‘Plastic & Climate: The Hidden Costs of a Plastic Planet’ (*Center for International Environmental Law*, May 2019) 1 <<https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf>> accessed 29 July 2021.

¹¹ Lawand others (n1).

¹² DEFRA. ‘Our Waste’ (n3).

¹³ European Commission Press Corner, *Questions & Answers: A European Strategy for Plastics* (Fact Sheet 16 January 2018) <https://ec.europa.eu/commission/presscorner/detail/sv/MEMO_18_6> accessed 29 July 2021.

households and businesses; local authorities are responsible for recycling household waste while businesses predominantly transfer liability to private entities.

All controlled waste in the UK, or waste governed by law, is divided into waste arising from household, commercial and industrial sources.¹⁴ Data surrounding how much household waste is recycled can be derived from municipal waste statistics, while C&I waste is considered one category by DEFRA.¹⁵ This article similarly makes no distinction between entities which might self-identify as one or the other.

On paper, commercial and industrial (C&I) recycling rates are higher than household ones. DEFRA estimates the domestic recycling rate between 2015 and 2019 grew from 44.5% to only 46.2%;¹⁶ the C&I sector, tasked with recycling a percentage of the packaging it produces, achieved an estimated recycling rate of 62.1% in 2018.¹⁷

It must be noted that most figures purporting to show recycling rates involve approximations, due to the size of the waste industry. DEFRA conceded in 2018 that its commercial recycling estimates previously relied upon several flawed assumptions.¹⁸ One example provided was that the model neglected to incorporate reclassifications of waste occurring at transfer stations, facilities where waste is stored temporarily after collection.¹⁹ The credibility of data referenced throughout this article will be evaluated as presented.

This article will analyse whether the difference in legislation governing each sector is responsible for their disparate rates. It will outline both sectors' contributions to the circular economy, asking whether current legislation sufficiently accounts for the influence commercial actions have on the composition of household waste.

¹⁴ Environmental Protection Act 1990, s 75.

¹⁵ Department for Environment, Food and Rural Affairs, 'UK Statistics on Waste' (2021) 3<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002246/UK_stats_on_waste_statistical_notice_July2021_accessible_FINAL.pdf> accessed 29 July 2021.

¹⁶ Ibid.

¹⁷ Ibid 8.

¹⁸ Department for Environment, Food and Rural Affairs, 'Commercial and Industrial Waste Arisings Methodology Revisions for England' (2018) 1 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873328/Commercial_and_Industrial_Waste_Arisings_Methodology_Revisions_Oct_2018_contact_details_update_v0.2.pdf> accessed 29 July 2021.

¹⁹ Ibid.

2. Recycling in the UK – Differences between Commercial and Household Obligations

2.1 Introduction: An Overview of Legislation

The UK derives “much of [its] waste legislation... from EU legislation”.²⁰ The most notable transplant of EU directives into UK law is the Environmental Protection Act 1990 (EPA) which is the basis for most of the present law on waste management. It is for this reason that EU targets and directives predating 2020 will be referenced as synonymous with UK law throughout this article, despite the UK’s departure from the EU in early 2020.²¹

The EU emphasises “the recovery and recycling of packaging” in order to achieve a circular economy.²² This is significant for the UK which concedes plastic makes up nearly half of its annual packaging waste.²³ In 2018, the EU determined its members should be recycling half of all discarded plastic packaging by 2025.²⁴ The UK estimates that, as of 2020, it recycles 47.4%.²⁵

Waste collection authorities are responsible for the collection and disposal of municipal waste,²⁶ most of which is from households. In practice, this is a local authority (LA) such as a council. LAs can handle waste themselves or outsource management to private enterprises. LAs have also had a duty to arrange, where possible, separate collections of recyclables in England and Wales since 2010,²⁷ with Scotland and Northern Ireland following suit in 2012²⁸ and 2015.²⁹ LAs achieve this primarily by furnishing households with specific bins for recyclable items. Households are expected to commit rubbish to the correct bins, which LAs collect and manage. As part of the EU, the UK pledged to recycle 50% of all waste from

²⁰ Louise Smith, *Plastic Waste* (House of Commons Briefing Paper 08515, 2021) <<https://researchbriefings.files.parliament.uk/documents/CBP-8515/CBP-8515.pdf>> accessed 29 July 2021.

²¹ European Union (Withdrawal Agreement) Act (n2).

²² Council Directive 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste [2018] OJ L150/14.6.2018.

²³ DEFRA, ‘Our Waste’ (n3).

²⁴ European Parliament and the Council, *Council Directive 2018/852* (n22).

²⁵ DEFRA, ‘UK Statistics on Waste’ (n15).

²⁶ Environmental Protection Act (n14) s 45-53.

²⁷ Household Waste Recycling Act 2003, s 1.

²⁸ The Waste (Scotland) Regulations 2012, SI 2012/148.

²⁹ The Waste Regulations (Northern Ireland) 2011, SR 2011/127, s 18.

households by 2020³⁰ and still maintains a blanket target of achieving a 65% municipal recycling rate by 2035,³¹ of which household waste is a component.

DEFRA maintains no comparable blanket target for waste from all corporate bodies.³² This is despite its estimate that the UK generated 41.1 million tonnes of C&I waste in 2016, compared to 27.3 million generated by households.³³ Instead, under the packaging regulations (PRs), producers of packaging waste—businesses which meet statutory criteria—must finance the recycling and recovery of certain percentages of materials.³⁴ They are not beholden to mandated techniques for waste management like the kerbside collection system. Instead, they are afforded the flexibility to find a favourable compliance scheme. Businesses generally outsource the handling of what they discard to private waste management companies registered with the Environment Agency.³⁵

Yet, outside of the PRs, the EPA provides that any UK business which “imports, produces, carries, keeps, treats or disposes of” waste has a duty of care towards its management.³⁶ Despite their freedom of choice, the C&I sector is subject to much stricter regulation than households. Citizens can utilise a plastic recycling depository on their kerbs, while businesses must determine what to do with every bit of waste. DEFRA has been traditionally reluctant to punish citizens for improper bin usage, i.e. through fines, vowing a “balanced approach [towards] minor breaches.”³⁷ This contrasts with no-tolerance policies levelled at businesses. Babergh District Council lays out that a company breaks the law if they even utilise a street litter bin.³⁸ Given the government’s 2016 estimate on how much waste the C&I sector produced compared to households, this seems appropriate.

³⁰ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance) [2008] OJ L 312/22.11.2008.

³¹ DEFRA, ‘Our Waste’ (n3).

³² The Controlled Waste Regulations 1992, SI 1992/588.

³³ DEFRA, ‘UK Statistics on Waste’ (n15).

³⁴ The Producer Responsibility Obligations (Packaging Waste) Regulations 2007, SI 2007/871.

³⁵ *Ibid*, s 26.

³⁶ Environmental Protection Act (n14) s 34(1).

³⁷ Department for Environment, Food & Rural Affairs, ‘Household Waste Bins: When and How Councils May Issue Fixed Penalties’ (23 April 2018) <<https://www.gov.uk/guidance/household-waste-bins-when-and-how-councils-may-issue-fixed-penalties>> accessed 29 July 2021.

³⁸ Babergh District Council, ‘Disposing of Waste Disposing of Waste from your Business: Your Guide to the Law’ (Babergh Mid Suffolk, February 2018) 2 <<https://www.babergh.gov.uk/assets/Waste-Services/Business-Waste/Disposing-of-Waste-from-your-Business-Booklet.pdf>> accessed 29 July 2021.

However, analysis of the data which lead to that estimate betrays a sizeable divide in how both sectors are regulated.

2.2 What Data Discrepancies Say About the Reality of Recycling

DEFRA acknowledges its figures on UK waste are best described as estimates. In 2020, it expressed difficulty with C&I “data limitations and... gaps”, identifying that calculating the recycling rates of business waste carries a “higher level of uncertainty” than calculating rates for LA-collected waste.³⁹

Estimates of how much household waste is recycled per tonnage rely on data taken from LAs. This is not without room for error. DEFRA notes that waste collection is a devolved matter⁴⁰ and every LA meets their statutory obligations differently. For example, some LAs provide more specialised bins than others. An LA which provides a separate bin for garden waste will have fewer citizens frustrating the recycling process by placing such waste in the same receptacle as their recyclables, thus facilitating simpler data collection.

LAs are more incentivised than businesses to ensure accurate reporting. In order to justify waste collection decisions to their electorate, LAs must produce data collected with some degree of integrity. Conversely, businesses are incentivised to under-report waste they produce and over-report how much is then recycled. This is because they must provide evidence that they have financed the recovery and recycling of a target percentage of all recyclable packaging materials they handle annually.⁴¹ This entails keeping descriptive records of all rubbish handed over to private companies in the form of transfer notes for two years.⁴²

The result is that producers must only account for discrepancies if a government agency specifically requests their records. In order to identify discrepancies in the first place, those agencies must have developed some external reason to question the entity’s practices. Businesses have no electorate to consider, nor are they immediately visible if their waste management is reckless.

³⁹ DEFRA, ‘UK Statistics on Waste’ (n15).

⁴⁰ *Ibid.* 18-19.

⁴¹ The Producer Responsibility Obligations (Packaging Waste) Regulations 1997, SI 1997/648.

⁴² The Waste (England and Wales) Regulations 2011, SI 2011/988, s 35; The Controlled Waste (Duty of Care) Regulations (Northern Ireland) 2002, SR 2002/271, s 2; The Environmental Protection (Duty of Care) (Scotland) Regulations 2014, SSI 2014/4.

Despite this, the government places a degree of trust in private sector self-reporting. DEFRA estimates the UK produced 2.25 million tonnes of plastic in 2015, recycling 39.4% of it.⁴³ Reflecting in 2018, environmental consultancy Eunomia noted that DEFRA achieved this figure by simplistically comparing the tonnage of plastic recycled that year to plastic placed on the market by producers,⁴⁴ a figure gleaned from self-reporting by those same producers. This figure ignored what became of plastic with moisture and contaminants.⁴⁵ According to Eunomia's reassessing of the composition of UK waste, British plastic packaging output was “likely... around 3.5 million tonnes”.⁴⁶ This instead places the UK's 2015 recycling rate between 23% and 29%,⁴⁷ suggesting the UK potentially “failed to meet its plastic packaging recycling targets... from 2008-2012”.⁴⁸

Of note is the fact that DEFRA outsourced commercial data collection partly to Valpak,⁴⁹ a private company offering businesses waste management. In a general sense, any such entity harbours a vested interest in attracting new clients. The National Audit Office reported in 2018 that the UK boasted “one of the lowest cost[s] of [recycling] compliance to businesses”⁵⁰ in Europe, but the claim is tempered somewhat by recognition that this conclusion was based on “data and estimates collated by Valpak”.⁵¹ Providing the UK government with favourable statistics about its own performance provides companies in turn with their own ‘circular economy’ of selling points.

Division between the accuracy of estimates about municipal waste and commercial waste is even more startling when it becomes apparent that only one side of the equation receives continuous oversight. The EPA expects LAs to have a demonstrable understanding of what waste they collect, and what happens to it post-collection. Yet the central government seemingly not only trusts the corporate sector

⁴³ Smith (n20).

⁴⁴ Eunomia Research & Consulting Ltd, 'Plastic Packaging - Shedding Light on UK Data' (*Eunomia*, 6 March 2018) <<https://www.eunomia.co.uk/reports-tools/plastic-packaging-shedding-light-on-the-uk-data/>> accessed 29 July 2021.

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*

⁴⁹ *Ibid.* 15.

⁵⁰ National Audit Office, *The packaging recycling obligation* (HC 2017–2019, 1386).

⁵¹ *Ibid.*

to responsibly manage its duties, but to conduct its own analysis after the fact on how successful it has been with regards to recycling.

The government is not unaware of this problem. After departing the EU, which set most of the UK's targets, the UK began assembling its own apparatus of environmental law, beginning with the Environment Act 2021. With this Act it intends to introduce a Scheme Administrator, a not-for-profit organisation that would decide how to achieve targets⁵² in commercial recycling, with the benefit of new data reporting requirements.⁵³ However, DEFRA confirmed in 2022 that this Administrator would primarily “provide support and advice to producers” on reporting their data, and would accept “estimates for secondary and tertiary packaging until 2027”.⁵⁴ In other words, the UK has thus far expressed little interest in using its legislative independence to more meaningfully validate commercial self-reporting.

The UK's success with recycling plastic is therefore perhaps best understood by analysing not its reported results, but its targets.

2.3 Targets I: The Burden on Households

The government wants 65% of all municipal waste recycled by 2035.⁵⁵ Municipal waste does not strictly refer to waste collected from households; rather, it is defined as “all waste collected by the local authority”,⁵⁶ which includes sources such as waste from companies which pay LAs to handle their output. The UK did adopt an

⁵² Department for Environment, Food and Rural Affairs, 'Extended Producer Responsibility for Packaging: Consultation Document' (24 March 2021) 149 <https://consult.defra.gov.uk/extended-producer-responsibility/extended-producer-responsibility-for-packaging/supporting_documents/23.03.21%20EPR%20Consultation.pdf> accessed 29 July 2021.

⁵³ Ibid. 175.

⁵⁴ Department for Environment, Food and Rural Affairs, 'Extended Producer Responsibility for Packaging: Summary of Consultation Responses and Government Response' (26 March 2022) 24-69 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063589/epr-consultation-government-response.pdf> accessed 29 July 2021.

⁵⁵ DEFRA, 'Our Waste' (n3).

⁵⁶ Department for Environment, Food & Rural Affairs, 'Local Authority Collected Waste – Definition of Terms' (23 September 2011) <<https://www.gov.uk/guidance/local-authority-collected-waste-definition-of-terms>> accessed 24 April 2022.

EU directive to specifically recycle 50% of all waste from households by 2020;⁵⁷ Wales was the only constituent country to meet the target.⁵⁸

Nevertheless, the 65% municipal target disproportionately affects households over other sources of municipal waste. This is because waste collected from households makes up the majority of waste collected by British LAs. In the years 2019-20, waste from Welsh and Northern Irish households accounted for “the majority of all municipal waste”⁵⁹ at “85.8 per cent”⁶⁰ and “88.2 per cent”⁶¹ respectively.

Environmental charity Waste & Resources Action Programme (WRAP) noted that data on “commercial municipal waste collected in England” is “not readily available” but nonetheless estimated that waste from households constituted 56% of all waste collected by LAs in England in 2017.⁶² An equivalent “waste composition analysis” is currently being undertaken for the years 2021-24 by Zero Waste Scotland.⁶³

DEFRA highlighted tackling plastic as an “urgent need” in 2018”.⁶⁴ Despite this, the municipal target does not specify how much of the waste recycled should be plastic. DEFRA subsequently identified that plastic constituted just 8.5% of all dry recycling collected from households the following year,⁶⁵ suggesting a disconnect between DEFRA’s priorities and that of LAs. DEFRA’s revised methodology for data analysis also excludes “recycling rejects”.⁶⁶ If recycling centres find waste they cannot recycle

⁵⁷ European Parliament and the Council, *Directive 2008/98/EC* (n30).

⁵⁸ BBC News, 'Where Does Recycling and Rubbish from the UK Go?' *BBC News* (London, 25 October 2021) <<https://www.bbc.co.uk/news/science-environment-49827945>> accessed 24 April 2022.

⁵⁹ Statistics for Wales, 'Local Authority Municipal Waste Management, 2019-20' (Welsh Government, 26 November 2020) 2 <<https://gov.wales/sites/default/files/statistics-and-research/2020-11/local-authority-municipal-waste-management-april-2019-march-2020-628.pdf>> accessed 24 April 2022.

⁶⁰ *Ibid.*

⁶¹ Northern Ireland Statistics and Research Agency, 'Northern Ireland Local Authority Collected Municipal Waste Management Statistics' (26 November 2020) 4 <<https://cdn.ca.emap.com/wp-content/uploads/sites/6/2020/11/NI-municipal-waste-2019-20-report.pdf>> accessed 24 April 2022.

⁶² Waste & Resources Action Programme, 'Municipal Waste Composition - England 2017' (January 2020) 6 <https://wrap.org.uk/sites/default/files/2020-11/WRAP-National%20municipal%20waste%20composition_%20England%202017.pdf> accessed 24 April 2022.

⁶³ Zero Waste Scotland, 'Waste Composition Analysis Programme 2021-2024' (2021) <<https://www.zerowastescotland.org.uk/content/waste-composition-analysis-programme-2021-2024>> accessed 24 April 2022.

⁶⁴ DEFRA, 'Our Waste' (n3).

⁶⁵ Department for Food, Environment and Rural Affairs, 'Statistics on Waste Managed by Local Authorities in England in 2019/20' (DEFRA, 3 March 2021) 10 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966114/Statistics_on_waste_managed_by_local_authorities_in_England_in_2019v3_accessible.pdf> accessed 29 July 2021.

⁶⁶ *Ibid.* 27.

mixed in with waste they can, they may reject an entire batch. As a result, LAs must dispose of it as though it was not recyclable, not only removing plastics from the circular economy forever, but from DEFRA's data. Journalists reported “nearly half a million tonnes of [contaminated] recycling was dumped by councils in landfill or incinerated” in 2018.⁶⁷

This is perhaps because some LAs are unequipped to recycle plastics as robustly as others. DEFRA has ambitiously announced LAs “will have to collect film and flexible plastic by March 2027” which is a service 96% of LAs currently cannot provide.⁶⁸ A diligent recycler who is aware their LA sends plastic film to landfills will most likely have to discard some regardless. Greenpeace estimated that UK supermarkets generated “at least 114 billion pieces of plastic packaging” in 2019⁶⁹—almost all of which would have been single-use, binned after serving its purpose. Citizens must participate in ensuring most of their collective waste is recycled but have little choice in how much unrecyclable plastic they bring into their homes.

Though businesses receive no all-encompassing target, they do have packaging-specific targets which encourage them to be discerning about identifying their waste under the Packaging Regulations (PRs). This is law designed to secure financing for the recycling of packaging waste, including plastic.

2.4 Targets II: Policing the Producers

Since 1997 (1999 in NI⁷⁰), qualifying producers of “packaging materials” in the UK have shared a collective responsibility to ensure the “recovery and recycling” of target percentages of said materials placed on the market.⁷¹ An obligated business is defined as one which annually handles “more than 50 tonnes of... packaging

⁶⁷ Matthew Davies and Nada Farhoud, '500,000 Tonnes of Recycling Dumped by Councils - With Most Put in Landfill' *The Mirror* (London, 7 March 2019) <<https://www.mirror.co.uk/news/uk-news/500000-tonnes-recycling-dumped-councils-14102224>> accessed 29 July 2021.

⁶⁸ Mark Smulian, 'Councils Say Business Waste EPR Plans Will See Material Going Uncollected' *Materials Recycling World* (28 March 2022) <<https://www.mrw.co.uk/news/councils-say-business-waste-epr-plans-will-see-material-going-uncollected-28-03-2022/>> accessed 24 April 2022.

⁶⁹ Greenpeace, 'UNPACKED: How Supermarkets Can Cut Plastic Packaging in Half by 2025' *Greenpeace* (London, 28 August 2020) 6 <https://www.greenpeace.org.uk/wp-content/uploads/2020/08/Greenpeace_Unpacked_Report.pdf> accessed 29 July 2021.

⁷⁰ The Producer Responsibility Obligations (Packaging Waste) Regulations (Northern Ireland) 1999, SR 1999/115.

⁷¹ The Producer Responsibility Obligations (Packaging Waste) Regulations (n41).

materials” and amasses a £2,000,000 turnover.⁷² Businesses may outsource their responsibilities to accredited compliance schemes, such as Valpak, generally by purchasing a “packaging waste recovery note”⁷³ (PRN). A PRN certifies that the purchaser has financed an adequate amount of recycling in satisfaction of their share of the national targets.

On the face of it, the targets set by the PRs justify high household recycling targets even if plastic is unavoidable in everyday life, because businesses which supply plastic to consumers are financially taken to task. Sellers—persons who ultimately pass the packaging along to consumers—are collectively held responsible for 48% of packaging recovery and recycling within the UK.⁷⁴ Supermarkets occupy this category. Manufacturers, who merely convert “raw materials [into] packaging”, are answerable for 6%.⁷⁵

But businesses still ‘outsource’ the liability of what becomes of their plastic products. To satisfy the PR’s element of recovery, companies need only purchase a PRN allegedly certifying a certain amount of waste has been recovered by waste management enterprises.

The government has expressed an intention to introduce Extended Producer Responsibility for Packaging (EPR).⁷⁶ An overhaul of the PRN system, it would see producers “forced to pay full net costs of disposal of packaging they place on the market”,⁷⁷ under the watch of the aforementioned Scheme Administrator. Given the ubiquity of plastic, it can be concluded that EPR would benefit the circular economy primarily in one of two ways. Qualifying producers can either limit their reliance on plastic in order to lower their overhead, or fund more recycling of plastic than merely a percentage of their output, as is currently mandated by the PRs.

However, because EPR would still see businesses outsourcing the ultimate management of plastic waste, there remains a potential for recycling fraud.

Analysing the PRN system, the National Audit Office noted that purchasing a PRN

⁷² The Producer Responsibility Obligations (Packaging Waste) Regulations (n34).

⁷³ *Ibid.*

⁷⁴ *Ibid.* reg 4(4).

⁷⁵ *Ibid.*

⁷⁶ DEFRA, 'Extended Producer Responsibility for Packaging: Summary of Consultation Responses and Government Response' (n54).

⁷⁷ Matt Mace, 'Defra Delays Extended Producer Responsibility Reforms' *Edie Newsroom* (4 March 2022) <<https://www.edie.net/defra-delays-extended-producer-responsibility-reforms/>> accessed 24 April 2022.

does not ensure the waste will actually be recycled. Some compliance schemes send waste abroad, resulting in a “particular risk that some of the material exported overseas is not fully recycled”.⁷⁸ This would remain a vulnerability under EPR. Both LAs and businesses can count exported waste towards their recycling targets. Only businesses are permitted to spare no further thought to their waste once they have paid the mandated costs, while LAs undergo continuous scrutiny from central government.

Empowering a central Scheme Administrator to directly liaise with producers would perhaps better enable bodies such as the Environment Agency (EA), DEFRA’s enforcement arm, to identify incidents of fraudulent reporting. However, identification is meaningless without resources to then take action. Reporting in 2021 identified that, since 2010, “funding for the EA’s work has been cut by nearly two-thirds”.⁷⁹ Significant failings in commercial recycling may go unnoticed without enough compliance officers trained in identifying breaches. 2020’s public register of accredited compliance schemes contained 48 companies.⁸⁰ In that year, the EA planned “10 [scheme] site inspections”.⁸¹ This works out at a mere 20% of schemes active in the UK, coupled with the EA’s admission that it was not able to monitor producers and waste handlers until new recruits completed training.⁸² It is difficult to imagine this was not the result of DEFRA receiving the “largest cuts to its resources budget of any government department since 2009”⁸³ just five years prior.

Misreporting from producers may not always be malicious. Well-meaning businesses can erroneously believe their packaging falls within reporting exemptions, but making allowances for small businesses is itself problematic. The UK contained 5.82 million

⁷⁸ National Audit Office (n50).

⁷⁹ Sandra Laville, 'Cutbacks Stopping Vital Work on River Pollution and Floods in England' *The Guardian* (London, 22 June 2021) <<https://www.theguardian.com/environment/2021/jun/22/cutbacks-stopping-vital-work-on-river-pollution-and-floods-in-england-environment-agency>> accessed 29 July 2021.

⁸⁰ National Packaging Waste Database, 'Public Register of Compliance Schemes' (Environment Agency, 2021) <<https://npwd.environment-agency.gov.uk/publicRegisterSchemes.aspx>> accessed 29 July 2021.

⁸¹ Environment Agency, 'Packaging Producer Responsibility Monitoring Plan 2020' (Gov UK, 2020) <<https://www.gov.uk/government/publications/packaging-producer-responsibility-monitoring-2020/packaging-producer-responsibility-monitoring-plan-2020>> accessed 29 July 2021.

⁸² Ibid.

⁸³ Emma Howard, 'Defra Hit by Largest Budget Cuts of any UK Government Department, Analysis Shows' *The Guardian* (London, 11 Nov 2015) <<https://www.theguardian.com/environment/2015/nov/11/defra-hit-by-largest-budget-cuts-of-any-uk-government-department-analysis-shows>> accessed 29 July 2021.

small businesses in 2019, defined as employing up to 49 workers.⁸⁴ Even if it is unlikely that these businesses handled 50 tonnes of packaging waste, they will still have placed some plastic on the market without having to finance recycling. LAs do not have the luxury of overlooking waste from small households to sanitise their figures.

A more immediate concern is that companies will be able to reduce some of the financial impact of EPR by raising the prices of their products, subsequently allowing business as usual without alterations to their use of plastic. One representative from the packaging industry noted EPR could “result in higher prices” for the public, especially with “food and drinks”.⁸⁵ It is not always possible to find products without plastic packaging. Plastic is not only uniquely equipped for “prolonging [the] shelf life” of perishables; it is “lighter than alternatives such as glass and card... [which] reduces transportation costs”.⁸⁶ Plastic remains an attractive packaging material, and reporting in 2019 noted it is “cheaper for major manufacturers to use new plastic” than recycled “due to a flood of petrochemicals production from the US driven by [a] shale gas boom”.⁸⁷ Even if EPR funds more plastic recycling, it will not necessarily decrease plastic creation.

Plans for introducing EPR were met by concern from commercial bodies. The chief executive of the Industry Council for Packaging and the Environment, an independent observer, noted that the Scheme Administrator would have to be capable of employing up to 250 staff to facilitate the workload of managing an

⁸⁴ Department for Business, Energy & Industrial Strategy, 'Business Population Estimates for the UK and Regions: 2019 Statistical Release' (DBEIS, 14 January 2020) <<https://www.gov.uk/government/statistics/business-population-estimates-2019/business-population-estimates-for-the-uk-and-regions-2019-statistical-release-html>> accessed 29 July 2021.

⁸⁵ James Langley, 'EPR Prompts Discussions on Consumer Costs' *Let's Recycle* (17 June 2021) <<https://www.letsrecycle.com/news/epr-prompts-discussions-on-consumer-costs/>> accessed 24 April 2022.

⁸⁶ Manoj Dora and Eleni Iacovidou, 'Why Some Plastic Packaging is Necessary to Prevent Food Waste and Protect the Environment' *The Conversation* (7 June 2019) <<https://theconversation.com/why-some-plastic-packaging-is-necessary-to-prevent-food-waste-and-protect-the-environment-117479>> accessed 24 April 2022.

⁸⁷ Jillian Ambrose, 'War on Plastic Waste Faces Setback as Cost of Recycled Material Soars' *The Guardian* (London, 13 October 2019) <<https://www.theguardian.com/environment/2019/oct/13/war-on-plastic-waste-faces-setback-as-cost-of-recycled-material-soars>> accessed 24 April 2022.

industry worth “£2-3 billion a year” while also meeting the government's requirement of being a non-profit body.⁸⁸

Industry objections have historically been enough to influence DEFRA to revise targets. DEFRA lowered its business recycling target for wood from 48% for 2020 to 35% for 2021, citing “the view of producers that the target [was] too high”.⁸⁹ DEFRA described its decision as “a compromise between achievability and ambition” despite the fact “most wood recyclers” consulted by the department “did not share” the producers’ views.⁹⁰ DEFRA not only set a precedent for commercial ‘ambition’ trumping environmental ‘ambition’ but did so in the same year it was purporting to address shortfalls in C&I recycling by overhauling the system. Without EU directives, the UK is responsible for setting all its own targets, not simply for wood. It should be noted the introduction of EPR overhaul was delayed indefinitely by DEFRA in March 2022, citing their initial 2023 roll-out date as providing “insufficient time for businesses to prepare”.⁹¹

2.5 Sub-conclusion

The UK explicitly recognises the importance of recycling plastic, and attempts to induct households and businesses into a circular economy. The two sectors are subject to different recycling targets, though both outsource plastic waste: LAs collect recyclables from households, and businesses find recycling solutions on the free market.

This has led to a discrepancy in data as household waste is scrutinised directly by LAs while businesses are afforded room to self-report and transfer liability to private enterprises. DEFRA’s suggested reforms may limit these gaps but without proposals for more robust methods of data collection concerning commercial waste it will remain impossible for the UK to confirm any claims that it meets its statutory recycling targets for the sector.

⁸⁸ Joshua Doherty, 'EPR Could Fail Over Financing, Warns Vanston' *Let's Recycle* (1 February 2022) <<https://www.letsrecycle.com/news/epr-could-fail-over-financing-warns-vanston/>> accessed 24 April 2022.

⁸⁹ DEFRA, 'Extended Producer Responsibility for Packaging' (n52).

⁹⁰ Ibid.

⁹¹ Joshua Doherty, 'No New EPR System for 2023, Defra Says' *Let's Recycle* (3 March 2022) <<https://www.letsrecycle.com/news/no-new-epr-system-2023-defra-says/>> accessed 24 April 2022.

It is also apparent that, despite producers of plastic waste financing its management, LAs ultimately shoulder a disproportionate amount of responsibility for seeing it recycled. Yet, the British municipal recycling rate has all but stagnated. Either the commercial sector is to blame for the shortcomings of LAs, or the municipal recycling system has its own flaws.

3. Plastics and the People

3.1 Introduction

DEFRA estimates households contributed 12% of Britain's waste in 2018—behind the C&I and construction sectors at 19% and 62% respectively.⁹² Despite recognising that households are one of the lowest contributors, the government arguably expects the most comprehensive participation from them in meeting recycling targets, as household waste forms the bulk of municipal waste, which is subject to a recycling target of 65% by 2035.⁹³

However, municipal recycling is not on track to meet DEFRA's ambitions, having improved 1.7% between 2015 and 2019.⁹⁴ If this trend continues, DEFRA's goal will be achieved in 2064. Historical data indicates this is not because the target is unrealistic. In a 2016/17 comparison of English LAs, one council reported a recycling rate of 64%.⁹⁵ The lowest performer skewed the average with a rate of just 14%.⁹⁶

By virtue of containing the consumers who buy it, households are the last port of call for most plastic. High municipal recycling rates are therefore vital to the circular economy. Because some LAs are closer to the 65% target than others, the answer to how household plastic recycling can improve lies in analysis of the scheme dealing with the bulk of municipal waste: the recycling bin system.

⁹² DEFRA, 'UK Statistics on Waste' (n15).

⁹³ DEFRA, 'Our Waste' (n3).

⁹⁴ DEFRA, 'UK Statistics on Waste' (n15).

⁹⁵ *Ibid.* 13.

⁹⁶ *Ibid.*

3.2 Bins: too Many or not Enough?

LAs are obligated to collect recyclable waste separately.⁹⁷ Most LAs do so by furnishing each household with one bin for general waste and at least one other for recycling. This system is easy for citizens and a straightforward discharge of an LA's statutory duties. Yet there is no national standard for how many bins an LA should deploy and they do not have to comply if they cannot afford the program's cost. Dumfries and Galloway collected just one bin from households until 2021⁹⁸ while its geographical neighbour South Ayrshire introduced six bins per household in 2018, designating receptacles for glass, paper, and metals or plastics.⁹⁹

The central government has unsuccessfully proposed a national model. Legislative commentary outlines that the Household Waste Recycling Act 2003 was originally tabled as the Municipal Waste Recycling Bill and "would have required the Secretary of State to draw up a [national] waste recycling strategy".¹⁰⁰ The commentary equates this to a "trespass on the territory of [devolved] administrations";¹⁰¹ it appears said administrations agreed. Household recycling was rolled out incrementally, with Northern Ireland mandating collections only in 2015.¹⁰²

Differences between LAs therefore reflect disharmony between the constituent countries of the UK. Some of the devolved governments are more aggressive with their country's recycling strategy than others. The Scottish Government's "lead agency for the circular economy" contains its mission statement in its name, Zero Waste Scotland;¹⁰³ Scotland is the only UK country to fund a body dedicated to advising its government on achieving zero waste. As previously noted, only Wales managed to meet the 50% recycling target for household waste by 2020. Following its departure from the EU, whether the UK's central government will capitalise on newfound freedom in setting municipal targets remains to be seen but it has thus far

⁹⁷ Environmental Protection Act (n14) s 45.

⁹⁸ BBC News Scotland, 'Be Positive' Plea Over New Dumfries and Galloway Bin Scheme' *BBC News* (London, 9 March 2021) <<https://www.bbc.co.uk/news/uk-scotland-south-scotland-56333782>> accessed 29 July 2021.

⁹⁹ David Allison, 'How Many Recycling Bins Is Too Many?' *BBC News* (London, 6 June 2018) <<https://www.bbc.co.uk/news/uk-scotland-44370569>> accessed 29 July 2021.

¹⁰⁰ Neil Parpworth, 'The Household Waste Recycling Act 2003' (2004) JPL 1180.

¹⁰¹ *Ibid.*

¹⁰² The Waste Regulations (Northern Ireland) (n29) s 18.

¹⁰³ Zero Waste Scotland, 'Building a Circular Economy for Scotland: Evidence from Zero Waste Scotland activities 2012–2016'

5<<https://www.zerowastescotland.org.uk/sites/default/files/ZWS1378%20CE%20Narrative%20Report%20FINAL.pdf>> accessed 24 April 2022.

made no attempt to introduce a recycling target of its own purely for household waste.

Britons must subsequently rely on their LAs to advise on what local recycling facilities can accept. But just as LA collection schemes vary by LA, so does the instructional information those LAs provide. Thus, 89% of respondents to a 2020 WRAP survey claimed to recycle regularly but four in five of surveyed households were found to be placing items in recycling bins which their LA could not recycle¹⁰⁴—perhaps because 44% of respondents noted that LAs are unclear on what is unrecyclable.¹⁰⁵ Guesswork and mistakes can be devastating to the circular economy. Slough Borough Council states it may incinerate a “whole vehicle load of recyclables” if food remnants are present.¹⁰⁶

One solution could be increasing how many bins LAs provide to households. This is Germany’s policy, another nation pledged to the circular economy. The 2012’s *Kreislaufwirtschaftsgesetz* legislation expanded the definition of recyclable municipal waste to include fourteen specific categories, ranging from plastic to used batteries.¹⁰⁷ German LAs generally conduct collections using six designated bins “classified according to a colour system.”¹⁰⁸ Conversely, British LAs do not synchronise the colours of their bins. They also need only account for five named materials: glass, metals, plastics, paper, and card.¹⁰⁹

The *Umweltbundesamt* (UBA), DEFRA’s German counterpart, reports Germany’s municipal recycling rate “reached 65% for the first time in 2012”, rising to 67% by

¹⁰⁴ Waste & Resources Action Programme, 'Key Findings from the Recycling Tracker 2020' (Waste & Resources Action Programme, 2020) <<https://wrap.org.uk/sites/default/files/2021-03/Key%20Findings%20from%20the%20Recycling%20Tracker%202020.pdf>> accessed 29 July 2021.

¹⁰⁵ Ibid.

¹⁰⁶ Slough Borough Council, 'Recycling - Contamination Frequently Asked Questions' *Citizen: Your E-Magazine from* (Slough Borough Council, April 2016) <<https://citizen.slough.gov.uk/april-2016/using-resources-wisely/recycling-contamination-frequently-asked-questions/>> accessed 29 July 2021.

¹⁰⁷ Gesetz zur Neuordnung des Kreislaufwirtschafts - und Abfallrechts (KrWG) (Act Reorganising the Law on Closed Cycle Management and Waste) 24 February 2012, Bundesgesetzblatt (BGBl) at nr. 10 § 3 (Germany). Official translation hosted at <https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Abfallwirtschaft/kreislaufwirtschaftsgesetz_en_bf.pdf> accessed 29 July 2021.

¹⁰⁸ Eduardo Bravo, 'The German Recycling System: The World's Best Recycling Country' *Tomorrow City* (2 September 2021) <<https://tomorrow.city/a/german-recycling-system>> accessed 24 April 2022.

¹⁰⁹ Environmental Protection Act (n14) s 75(7)(a).

2018.¹¹⁰ By the UBA's figures, the UK is seemingly failing to outperform Germany's lowest recycling rate in recent history. The UBA has been criticised for "opaque statistics", but Germany's recycling successes are acknowledged even by detractors, conceding Germany has likely developed the world's "biggest collection system" for a plastic commonly used in bottles.¹¹¹

Furthermore, Germany's central government can obligate an LA to introduce "a standard recycling bin"¹¹² while British LAs need not even offer physical bins. In some of the UK's urban areas, citizens receive recycling sacks. City of London Council delivers a roll of sacks to citizens twice yearly.¹¹³ Neighbouring borough Islington tasks residents of premises that lack "communal recycling container(s)" to collect their own bags from "collection points" such as public libraries.¹¹⁴ While the author is unaware of research on whether recycling sacks inspire poorer engagement than bins, what is known is that London had the UK's lowest 2019/20 regional recycling rate at 33.5%.¹¹⁵ In any case, LAs collecting recycling sacks must part with more money to sort waste than their German counterparts, which have already decreased sorting time at the point of collection.

The British government is not unaware of its options. The UK's departure from the EU necessitated the creation of the Environment Act 2021, providing a mechanism whereby the Secretary of State can "set long-term targets"¹¹⁶ for the UK instead of the EU. An adjacent consultation held by DEFRA in May 2021 sought opinions on what those targets should be, with the specific intention of using them to improve "consistency in household and business recycling in England".¹¹⁷ As of the time of

¹¹⁰ Federal Statistical Office of Germany, 'Indicator: Recycling Municipal Waste' *Umweltbundesamt* (Berlin, 18 August 2020) <<https://www.umweltbundesamt.de/en/data/environmental-indicators/indicator-recycling-municipal-waste>> accessed 29 July 2021.

¹¹¹ Katharina Wecker, 'Plastic Waste and the Recycling Myth' *Deutsche Welle* (Berlin, 12 October 2018) <<https://www.dw.com/en/plastic-waste-and-the-recycling-myth/a-45746469>> accessed 29 July 2021,

¹¹² KrWG (n107) para 10.

¹¹³ City of London, 'Clear Recycling Bags' (*City of London Corporation*, 25 November 2020) <<https://www.cityoflondon.gov.uk/services/waste-and-recycling/household-waste-and-recycling/clear-recycling-bags>> last accessed 29 July 2021

¹¹⁴ Islington London Borough Council, 'Recycling and Rubbish Container Guide' (Islington Council, 2021) <<https://www.islington.gov.uk/recycling-and-rubbish/recycling-and-rubbish-collections/recycling-and-rubbish-containers-guide/>> accessed 29 July 2021.

¹¹⁵ DEFRA, 'Statistics on Waste Managed by Local Authorities' (n65) 18.

¹¹⁶ Environment Act 2021 s 1.

¹¹⁷ Department for Food, Environment and Rural Affairs, 'Consultation on Consistency in Household and Business Recycling in England' (DEFRA, May 2021) 18 <<https://consult.defra.gov.uk/waste-and-recycling/consistency-in-household-and-business->

writing, the UK's targets have yet to be set. Nevertheless, several of the ideas considered by the consultation at least provide insight into the plan for England.

The government proposes to mandate that “food waste” should be collected “separately” from other recyclables,¹¹⁸ which would go some way towards decreasing contamination. To further combat contamination, the consultation proposed a “free minimum collection service for garden waste” but in doing so made reference to this collection utilising “either bin[s] or sacks”,¹¹⁹ indicating little legislative appetite for simply mandating the usage of physical bins.

Furthermore, the consultation highlights the government's intent to compel LAs to collect “glass, metal, plastic, and paper and card, from households... for recycling”.¹²⁰ Yet, this is not a new policy. Rather, it is an affirmation of categories that LAs have been responsible for collecting since 2011,¹²¹ albeit with a distinction drawn between paper and card. The consultation also confirmed the government will not be recommending “bin colour standardisation”,¹²² despite this perhaps being the simplest way to overcome public confusion as to what they should be placing in which bin from LA to LA. Not only is this standard practice in Germany, “harmonised colour-coding” for different waste streams is under consideration by the European Commission for implementation across the entire EU.¹²³

3.2 Municipal Resources, and the Burden from Business

Some LAs have the capacity to recycle fewer things than others, owing to budgetary constraints or even geography. One egregious example is the City of Westminster which incinerated 82% of its waste in 2017, recycling a mere 16.1%.¹²⁴ Its justification is that there were “no suitable sites available for waste facilities in

[recycling/supporting_documents/Recycling%20Consistency%20Final%20Consultation_May%202021.pdf](#)> accessed 24 April 2022.

¹¹⁸ Ibid. 8.

¹¹⁹ Ibid. 47.

¹²⁰ Ibid. 7.

¹²¹ Waste (England and Wales) Regulations (n42) s 13.

¹²² Ibid. 69.

¹²³ Dave Keating, 'Blue, Yellow or White? Recycling Varies Widely in the EU' *Euractiv* (Brussels, 10 December 2020) <<https://www.euractiv.com/section/circular-economy/news/blue-yellow-or-white-recycling-varies-widely-in-the-eu/>> accessed 24 April 2022.

¹²⁴ City of Westminster, 'City Plan 2019-2040' (Westminster City Council, 2019) 3 <https://www.westminster.gov.uk/sites/default/files/waste_evidence_base_june_2019.pdf> accessed 29 July 2021.

Westminster”.¹²⁵ By virtue of having no other financial considerations than waste management, private re-processors often have better recycling facilities than LAs, compelling some LAs to outsource to them.

Under EPR, “producers [would] fund local authorities for the collection and management of household packaging waste”.¹²⁶ However, LAs will still be unable to ‘plan’ for the waste they will have to handle. Most companies will have some idea of how much plastic they need to facilitate foreseeable commercial activity, but LAs must handle whatever citizens throw away. For example, an unexpected “surge in domestic rubbish” during the Covid-19 pandemic forced Cardiff council to start burning recyclables it would have otherwise attempted to process.¹²⁷

However, if the disposable items that consumers place in their municipal bins were more easily recyclable from the offset, LA shortcomings would not be so damaging to the circular economy. The government has introduced several related initiatives. Following the introduction of a charge for carrier bags, the BBC estimates that use of such bags declined 95% since 2015.¹²⁸ Given that only 18% of LAs had the capacity to recycle them as of 2018,¹²⁹ this is not an insignificant reduction of the burden that commercial waste ultimately ‘passes along’ to LAs. England banned supplying single-use plastic straws to consumers in 2020,¹³⁰ with Scotland and Wales “considering similar measures”.¹³¹

However, these measures have not yet coincided with significant improvement in the UK’s municipal recycling rate. This could be because the measures are relatively new. But individual bans on small plastic items can effectively displace the problem to other areas of the waste stream. The fast-food chain McDonald’s replaced plastic straws with paper ones which, while “fully recyclable”, are too thick for most LAs to

¹²⁵ Ibid.

¹²⁶ DEFRA, ‘Extended Producer Responsibility for Packaging’ (n52).

¹²⁷ Matthew Murray, ‘Coronavirus: Recycling Targets ‘Challenging’ During Pandemic’ *BBC News* (London, 1 May 2020) <<https://www.bbc.co.uk/news/uk-wales-52491453>> last accessed 29 July 2021.

¹²⁸ BBC News, ‘Higher Plastic Bag Charge Comes into Force in England’ *BBC News* (London, 21 May 2021) <<https://www.bbc.co.uk/news/business-57193108>> accessed 29 July 2021.

¹²⁹ Wesley Stephenson, ‘Why Plastic Recycling is so Confusing’ *BBC News* (London, 18 December 2018) <<https://www.bbc.co.uk/news/science-environment-45496884>> accessed 29 July 2021.

¹³⁰ The Environmental Protection (Plastic Straws, Cotton Buds and Stirrers) (England) Regulations 2020, SI 2020/971.

¹³¹ David Shukman, ‘Straws: UK Government to Bring in New Controls on Plastic’ *BBC News* (London, 22 May 2019) <<https://www.bbc.co.uk/news/science-environment-48358002>> accessed 29 July 2021.

process.¹³² Despite good intentions, the result of the straw ban is the same: businesses send items that LAs cannot recycle straight into municipal waste statistics.

Banning straws seems superficial when other single-use items are bigger pollutants. The Mayor of London's office asserts "7.7 billion plastic bottles are bought across the UK"¹³³ annually, but DEFRA has no plans to ban their manufacture. Instead, it has proposed a "deposit return scheme":¹³⁴ purchasers of plastic bottles pay a fee to be reimbursed upon returning them to designated sites. Like EPR, this risks simply pushing the cost of packaging onto consumers and, as one critic noted, "most of this work is already done more efficiently by kerbside collection".¹³⁵ Citizens are likelier to use bins at home than depositories; LAs will keep shouldering the result.

It could be argued that some of the problem arises from gaps in public awareness of what LAs can recycle. But simply raising awareness about the recyclability of everyday products is no guarantee recycling rates will improve, particularly with regards to plastic.

A 2018 survey of British recycling habits identified plastic bags as the "worst contaminator"¹³⁶ of all items submitted wrongly for municipal recycling. This is despite analysis in the same year finding only 18% of LAs were able to recycle them.¹³⁷ Yet it is difficult to conclude that citizens continue to put them in recycling bins due to ignorance. Between 2011 and 2015,¹³⁸ all UK nations introduced

¹³² BBC News, 'McDonald's Paper Straws 'Fully Recyclable' Makers Say' *BBC News* (London, 6 August 2019) <<https://www.bbc.co.uk/news/science-environment-48358002>> accessed 29 July 2021.

¹³³ London Assembly, Food and Rural Affairs, 'Single-Use Plastic Bottles' (Mayor of London, 2021) <<https://www.london.gov.uk/what-we-do/environment/waste-and-recycling/single-use-plastic-bottles>> accessed 29 July 2021.

¹³⁴ Department for Environment, Food & Rural Affairs, 'Consultation on Introducing a Deposit Return Scheme in England, Wales and Northern Ireland - Second Consultation' (March 2021) 13 <https://consult.defra.gov.uk/environment/consultation-on-introducing-a-drs/supporting_documents/DRS%20Consultation%20FINAL%20.pdf> accessed 29 July 2021.

¹³⁵ Christopher Snowden, 'A Load of Rubbish? Introducing a Deposit Return Scheme to the UK' (*Institute of Economic Affairs*, 14 April 2019) <<https://iea.org.uk/wp-content/uploads/2019/04/SNOWDON-bottle-deposit-scheme-ED-1.pdf>> accessed 29 July 2021.

¹³⁶ British Science Association, 'British Science Week Lifts Lid on Recycling Misconceptions' (BSA, 2018) <<https://www.britishtscienceassociation.org/news/british-science-week-lifts-the-lid-on-recycling-misconceptions>> accessed 29 July 2021.

¹³⁷ Stephenson (n129).

¹³⁸ The Single Use Carrier Bags Charge (Wales) Regulations 2010, SI 2010/2880; The Single Use Carrier Bags Charge Regulations (Northern Ireland) 2013 SI 2013/4; The Single Use Carrier Bags Charge (Scotland) Regulations 2014, SI 2014/161; The Single Use Carrier Bags Charges (England) Order 2015, SI 2015/776.

mandatory charges on carrier bags to “reduce the amount of plastic waste”.¹³⁹ Between 2014 and 2017, the government reported an 83% decrease in sales of bags.¹⁴⁰ Citizens experienced a visible attempt to minimise non-recyclable plastic waste. The bag charge’s logic is overt: because they are rarely recycled, the law discourages their purchase to preclude the creation of new bags. Nevertheless, citizens frequently commit them to recycling bins.

As one review of European recycling statistics concluded, awareness is insufficient for improving recycling rates because it “does not tackle waste generation itself”.¹⁴¹ Citizens have too much plastic waste to handle. Knowing that DEFRA has revised recycling targets to better accommodate ‘corporate ambition’ in the past, its bans on bags and straws pose a question of whether the government will take more significant steps.

3.3 Sub-conclusion

Municipal recycling targets are more ambitious than LAs are on track to achieve. Despite this, the central government largely leaves LAs to determine how to increase rates themselves. Some LAs have fared better than others for example by increasing the variety of recycling bins provided to households. But even areas with robust recycling systems struggle to near the 65% municipal target.

While citizen’s mistakes certainly influence municipal shortcomings, blame for why recycling targets remain so elusive lies largely with the commercial sector. The amount of unrecyclable plastic businesses place on the market outpaces the amount LAs can process by themselves. LA recycling facilities will benefit from EPR funding, but more aggressive reform must occur in the commercial sector to level the playing field.

¹³⁹ BBC News, 'Tesco Plastic Bag Use 'Down 80%' Since 5p Charge' *BBC News* (London, 5 December 2015) <<https://www.bbc.co.uk/news/business-35013520>> accessed 13 June 2022.

¹⁴⁰ Department for Environment, Food and Rural Affairs, 'Single-use Plastic Carrier Bags Charge: Data in England for 2016 to 2017' (2020) <<https://www.gov.uk/government/publications/carrier-bag-charge-summary-of-data-in-england/single-use-plastic-carrier-bags-charge-data-in-england-for-2016-to-2017>> accessed 29 July 2021.

¹⁴¹ Andreas Bartl, 'Moving from Recycling to Waste Prevention: A Review of Barriers and Enables' (2014) (32)9 *Waste Management & Research: The Journal for a Sustainable Circular Economy* 3.

4. Conclusion

This article compared the UK's commercial plastic recycling against that of households to determine if DEFRA estimates are right to suggest the former outperforms the latter. Both sectors are tasked with furthering the circular economy, recovering and recycling as much plastic as possible. Yet while DEFRA estimates C&I recycling targets are on their way to being met, the household recycling rate has stagnated.

This at first appears to be because municipal waste is legislatively disadvantaged. The EPA provides no blueprint for conducting waste collections; not all LAs have the same recycling facilities. They also lack the C&I sector's specific plastic recycling target. The absence of national standardisation results in wide disparities of recycling rates between even geographically contiguous LAs. This is in contrast to businesses which may outsource their waste management to satisfy targets.

However, much of the waste LAs fail to recycle originates from corporate entities which are largely reluctant to move away from single-use plastics until legislation bans them. Even LAs with poor recycling facilities would see a marked improvement in their recycling rates if the producers of packaging waste committed to creating less of the waste to begin with rather than simply buying their way out of blame.

Furthermore, because the data on C&I waste relies on self-reporting in a way that municipal statistics do not, it appears unlikely that the recycling rate is as high as DEFRA asserts. As per Eunomia's reporting, DEFRA's claim of a 39.4% plastic recycling rate in 2015 could instead have been closer to 23%. No such reports as Eunomia's exist that so drastically recalculate DEFRA's estimates for municipal recycling.

DEFRA's proposals for extended producer responsibility appear to address these concerns, either by introducing an administrator to consolidate data, or by having producers directly finance struggling LAs. However, legislation introduced to preclude plastic from entering municipal waste—bans on straws, charges for carrier bags—has not heralded significant recycling improvements. Nor has the government expressed purposeful commitment to limiting products which would materially reduce waste, such as single-use bottles. For this reason, it is difficult to conclude DEFRA will introduce policies which meaningfully reconstitute the waste stream.

There are some immediate steps LAs can take to improve household recycling rates, such as standardising bin colours with neighbouring authorities. Simply investing in providing households with physical bins—instead of recycling sacks—can benefit recycling rates. But the sheer volume of plastic placed on the market by the commercial sector presents an uphill battle. The municipal recycling rate would only near 65% if the British government banned the sale of not just straws, but all single-use plastics overnight.

This is unrealistic—consumers will still desire food shielded from rot—but as a thought experiment it betrays that the majority of the UK’s relevant legislation focuses on what should be done with plastic waste once it is out in the world. An ideal circular economy would concern itself with limiting plastic waste to begin with.

Despite this, scientific commentary notes much of the EU’s “current legislation has introduced quotas for recycling and recovery but hardly [any] for waste prevention”.¹⁴² It is infeasible that waste from a commodity as common as plastic can be rapidly reduced without pushback from businesses and consumers alike.

The solution, then, may lie in finding alternative materials. This is already on the government’s agenda: it issued a “call for evidence” on the topic of “biodegradable, compostable and bio-based plastics” in 2019.¹⁴³ These are relatively new developments: certainly not a ‘magic bullet’ that will solve the global plastic problem. However, it is recognised that some of these “plastics can be broken down by microbes” and “a subset of them are compostable.”¹⁴⁴

Real improvements to the circular economy’s health can only come with proportional commercial regulation. Instead of figuring out new ways to charge producers to ‘pitch in’ on managing their packaging, the UK could seize the opportunity afforded by its current bid for producer responsibility reform to streamline the circular economy: by instead holding producers to account for the financing of research into substitutes for plastic.

¹⁴² Bartl (n141)

¹⁴³ Department for Business, Energy & Industrial Strategy and Department for Environment, Food & Rural Affairs, 'Standards for Biodegradable, Compostable and Bio-based Plastics: Call for Evidence' (DEFRA and DBEIS, 22 July 2019) <<https://www.gov.uk/government/consultations/standards-for-biodegradable-compostable-and-bio-based-plastics-call-for-evidence>> accessed 29 July 2021.

¹⁴⁴ Kelly Oakes, 'Why Biodegradables Won't Solve the Plastic Crisis' *BBC Future* (London, 5 November 2019) <<https://www.bbc.com/future/article/20191030-why-biodegradables-wont-solve-the-plastic-crisis>> accessed 29 July 2021

Bibliography

Legislation

The Controlled Waste (Duty of Care) Regulations (Northern Ireland) 2002, SR 2002/271

The Controlled Waste Regulations 1992, SI 1992/588

Council Directive 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste [2018]OJ L150/14.6.2018

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance) [2008] OJ L 312/22.11.2008

Environment Act 2021

Environmental Protection Act 1990

The Environmental Protection (Duty of Care) (Scotland) Regulations 2014, SSI 2014/4

The Environmental Protection (Plastic Straws, Cotton Buds and Stirrers) (England) Regulations 2020, SI 2020/971

European Union (Withdrawal Agreement) Act 2020

Gesetz zur Neuordnung des Kreislaufwirtschafts - und Abfallrechts (KrWG) (Act Reorganising the Law on Closed Cycle Management and Waste) 24 February 2012, Bundesgesetzblatt (BGBl) at nr. 10 § 3 (Germany). Official translation hosted at https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Abfallwirtschaft/kreislaufwirtschaftsgesetz_en_bf.pdf accessed 29 July 2021

Household Waste Recycling Act 2003

The Producer Responsibility Obligations (Packaging Waste) Regulations 1997, SI 1997/648

The Producer Responsibility Obligations (Packaging Waste) Regulations 2007, SI 2007/871

The Producer Responsibility Obligations (Packaging Waste) Regulations (Northern Ireland) 1999, SR 1999/115

The Single Use Carrier Bags Charges (England) Order 2015, SI 2015/776

The Single Use Carrier Bags Charge (Scotland) Regulations 2014, SI 2014/161

The Single Use Carrier Bags Charge (Wales) Regulations 2010, SI 2010/2880

The Single Use Carrier Bags Charge Regulations (Northern Ireland) 2013 SI 2013/4

The Waste (England and Wales) Regulations 2011, SI 2011/988

The Waste Regulations (Northern Ireland) 2011, SR 2011/127

The Waste (Scotland) Regulations 2012, SI 2012/148

Journal Articles

Bartl A, 'Moving from Recycling to Waste Prevention: A Review of Barriers and Enables' (2014) (32) 9 *Waste Management & Research: The Journal for a Sustainable Circular Economy* 3

Gall S and Thompson R, 'The Impact of Debris on Marine Life' (2015) 92 *Marine Pollution Bulletin* 170

Geyer R, Jambeck J and Law K, 'Production, Use, and Fate of All Plastics Ever Made' (2017) 3(7) *Science Advances*

Law K and others, 'The United States' Contribution of Plastic Waste to Land and Ocean' (2020) 6(44) *Science Advances*

Nersesyan A and others, 'Results of Micronucleus Assays with Individuals Who Are Occupationally and Environmentally Exposed to Mercury, Lead and Cadmium' (2016) 770 *Mutation Research* 119

Parpworth N, 'The Household Waste Recycling Act 2003' (2004) *JPL* 1180

Books

Meikle J, *American Plastic: A Cultural History* (Rutgers University Press 1995)

Zeng E, *Microplastic Contamination in Aquatic Environments: An Emerging Matter of Environmental Urgency* (1st edn, Elsevier Science 2018)

Official Publications

City of Westminster, 'City Plan 2019-2040' (Westminster City Council, 2019)
<https://www.westminster.gov.uk/sites/default/files/waste_evidence_base_june_2019.pdf> accessed 29 July 2021

Department for Business, Energy & Industrial Strategy, 'Business Population Estimates for the UK and Regions: 2019 Statistical Release ' (DBEIS, 14 January 2020) <<https://www.gov.uk/government/statistics/business-population-estimates-2019/business-population-estimates-for-the-uk-and-regions-2019-statistical-release.html>> accessed 29 July 2021

Department for Business, Energy & Industrial Strategy and Department for Environment, Food & Rural Affairs, 'Standards for Biodegradable, Compostable and Bio-based Plastics: Call for Evidence' (DEFRA and DBEIS, 22 July 2019)
<<https://www.gov.uk/government/consultations/standards-for-biodegradable-compostable-and-bio-based-plastics-call-for-evidence>> accessed 29 July 2021

Department for Environment, Food and Rural Affairs, 'Commercial and Industrial Waste Arisings Methodology Revisions for England' (2018)
<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873328/Commercial_and_Industrial_Waste_Arisings_Methodology_Revisions_Oct_2018_contact_details_update_v0.2.pdf> accessed 29 July 2021

-- 'Consultation on Consistency in Household and Business Recycling in England' (DEFRA, May 2021) <https://consult.defra.gov.uk/waste-and-recycling/consistency-in-household-and-business-recycling/supporting_documents/Recycling%20Consistency%20Final%20Consultation_May%202021.pdf> accessed 24 April 2022

-- 'Consultation on Introducing a Deposit Return Scheme in England, Wales and Northern Ireland - Second Consultation' (March 2021)
<<https://consult.defra.gov.uk/environment/consultation-on-introducing-a->

[drs/supporting_documents/DRS%20Consultation%20FINAL%20.pdf](#)> accessed 29 July 2021

-- 'Extended Producer Responsibility for Packaging: Consultation Document' (24 March 2021) <https://consult.defra.gov.uk/extended-producer-responsibility/extended-producer-responsibility-for-packaging/supporting_documents/23.03.21%20EPR%20Consultation.pdf> accessed 29 July 2021

-- 'Extended Producer Responsibility for Packaging: Summary of Consultation Responses and Government Response' (26 March 2022) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063589/epr-consultation-government-response.pdf> accessed 29 July 2021

-- 'Our Waste, Our Resources: A Strategy for England' (2018) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf> accessed 29 July 2021

-- 'Single-use Plastic Carrier Bags Charge: Data in England for 2016 to 2017' (2020) <<https://www.gov.uk/government/publications/carrier-bag-charge-summary-of-data-in-england/single-use-plastic-carrier-bags-charge-data-in-england-for-2016-to-2017>> accessed 29 July 2021

-- 'UK Statistics on Waste' (2021) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002246/UK_stats_on_waste_statistical_notice_July2021_accessible_FINAL.pdf> accessed 29 July 2021

-- 'Statistics on Waste Managed by Local Authorities in England in 2019/20' (3 March 2021) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966114/Statistics_on_waste_managed_by_local_authorities_in_England_in_2019v3_accessible.pdf> accessed 29 July 2021

Environment Agency, 'Packaging Producer Responsibility Monitoring Plan 2020' (Gov UK, 2020) <<https://www.gov.uk/government/publications/packaging-producer->

[responsibility-monitoring-2020/packaging-producer-responsibility-monitoring-plan-2020](#)> accessed 29 July 2021

Federal Statistical Office of Germany, 'Indicator: Recycling Municipal Waste' *Umweltbundesamt* (Berlin, 18 August 2020)

<<https://www.umweltbundesamt.de/en/data/environmental-indicators/indicator-recycling-municipal-waste>> accessed 29 July 2021

National Audit Office, *The Packaging Recycling Obligation* (HC 2017–2019, 1386)

National Packaging Waste Database, 'Public Register of Compliance Schemes' (Environment Agency, 2021) <<https://npwd.environment-agency.gov.uk/publicRegisterSchemes.aspx>> accessed 29 July 2021

Northern Ireland Statistics and Research Agency, 'Northern Ireland Local Authority Collected Municipal Waste Management Statistics' (26 November 2020)

<<https://cdn.ca.emap.com/wp-content/uploads/sites/6/2020/11/Ni-municipal-waste-2019-20-report.pdf>> accessed 24 April 2022

Smith L, *Plastic Waste* (House of Commons Briefing Paper 08515, 2021)

<<https://researchbriefings.files.parliament.uk/documents/CBP-8515/CBP-8515.pdf>> accessed 29 July 2021

Statistics for Wales, 'Local Authority Municipal Waste Management, 2019-20' (Welsh Government, 26 November 2020)

<<https://gov.wales/sites/default/files/statistics-and-research/2020-11/local-authority-municipal-waste-management-april-2019-march-2020-628.pdf>> accessed 24 April 2022

Newspaper Articles

Allison D, 'How Many Recycling Bins Is Too Many?' *BBC News* (London, 6 June 2018) <<https://www.bbc.co.uk/news/uk-scotland-44370569>> accessed 29 July 2021

Ambrose J, 'War on Plastic Waste Faces Setback as Cost of Recycled Material Soars' *The Guardian* (London, 13 October 2019)

<<https://www.theguardian.com/environment/2019/oct/13/war-on-plastic-waste-faces-setback-as-cost-of-recycled-material-soars>> accessed 24 April 2022

BBC News, 'Higher Plastic Bag Charge Comes into Force in England' *BBC News* (London, 21 May 2021) <<https://www.bbc.co.uk/news/business-57193108>> accessed 29 July 2021

BBC News, 'McDonald's Paper Straws 'Fully Recyclable' Makers Say' *BBC News* (London, 6 August 2019) <<https://www.bbc.co.uk/news/science-environment-48358002>> accessed 29 July 2021

BBC News, 'Tesco Plastic Bag Use 'Down 80%' Since 5p Charge' *BBC News* (London, 5 December 2015) <<https://www.bbc.co.uk/news/business-35013520>> accessed 13 June 2022

BBC News, 'Where Does Recycling and Rubbish from the UK Go?' *BBC News* (London, 25 October 2021) <<https://www.bbc.co.uk/news/science-environment-49827945>> accessed 24 April 2022

BBC News Scotland, 'Be Positive' Plea Over New Dumfries and Galloway Bin Scheme' *BBC News* (London, 9 March 2021) <<https://www.bbc.co.uk/news/uk-scotland-south-scotland-56333782>> accessed 29 July 2021

Davies M and Farhoud N, '500,000 Tonnes of Recycling Dumped by Councils - With Most Put in Landfill' *The Mirror* (London, 7 March 2019) <<https://www.mirror.co.uk/news/uk-news/500000-tonnes-recycling-dumped-councils-14102224>> accessed 29 July 2021

Dora M and Iacovidou E, 'Why Some Plastic Packaging is Necessary to Prevent Food Waste and Protect the Environment' *The Conversation* (7 June 2019) <<https://theconversation.com/why-some-plastic-packaging-is-necessary-to-prevent-food-waste-and-protect-the-environment-117479>> accessed 24 April 2022

Gibbens S, 'You Eat Thousands of Bits of Plastic Every Year' *National Geographic* (6 June 2019) <<https://www.nationalgeographic.co.uk/environment/2019/06/you-eat-thousands-bits-plastic-every-year>> accessed 29 July 2021

Howard E, 'Defra Hit by Largest Budget Cuts of any UK Government Department, Analysis Shows' *The Guardian* (London, 11 Nov 2015) <<https://www.theguardian.com/environment/2015/nov/11/defra-hit-by-largest-budget-cuts-of-any-uk-government-department-analysis-shows>> accessed 29 July 2021

Laville S, 'Cutbacks Stopping Vital Work on River Pollution and Floods in England' *The Guardian* (London, 22 June 2021)

<<https://www.theguardian.com/environment/2021/jun/22/cutbacks-stopping-vital-work-on-river-pollution-and-floods-in-england-environment-agency>> accessed 29 July 2021

Mace M, 'Defra Delays Extended Producer Responsibility Reforms' *Edie Newsroom* (4 March 2022)

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf> accessed 24 April 2022

Murray M, 'Coronavirus: Recycling Targets 'Challenging' During Pandemic' *BBC News* (London, 1 May 2020) <<https://www.bbc.co.uk/news/uk-wales-52491453>> accessed 29 July 2021

Oakes K, 'Why Biodegradables Won't Solve the Plastic Crisis' *BBC Future* (London, 5 November 2019) <<https://www.bbc.com/future/article/20191030-why-biodegradables-wont-solve-the-plastic-crisis>> accessed 29 July 2021

Shukman D, 'Straws: UK Government to Bring in New Controls on Plastic' *BBC News* (London, 22 May 2019) <<https://www.bbc.co.uk/news/science-environment-48358002>> accessed 29 July 2021

Stephenson W, 'Why Plastic Recycling Is So Confusing' *BBC News* (London, 18 December 2018) <https://www.bbc.co.uk/news/science-environment-45496884> accessed 29 July 2021

Wecker K, 'Plastic Waste and the Recycling Myth' *Deutsche Welle* (Berlin, 12 October 2018) <<https://www.dw.com/en/plastic-waste-and-the-recycling-myth/a-45746469>> accessed 29 July 2021

Online Sources

Babergh District Council, 'Disposing of Waste Disposing of Waste from your Business: Your Guide to the Law' (Babergh Mid Suffolk, February 2018) <<https://www.babergh.gov.uk/assets/Waste-Services/Business-Waste/Disposing-of-Waste-from-your-Business-Booklet.pdf>> accessed 29 July 2021

Bravo E, 'The German Recycling System: The World's Best Recycling Country' *Tomorrow City* (2 September 2021) <<https://tomorrow.city/a/german-recycling-system>> accessed 24 April 2022

British Science Association, 'British Science Week Lifts Lid on Recycling Misconceptions' (BSA, 2018) <<https://www.britishtscienceassociation.org/news/british-science-week-lifts-the-lid-on-recycling-misconceptions>> accessed 29 July 2021

City of London, 'Clear Recycling Bags' (*City of London Corporation*, 25 November 2020) <<https://www.cityoflondon.gov.uk/services/waste-and-recycling/household-waste-and-recycling/clear-recycling-bags>> accessed 29 July 2021

Department for Environment, Food & Rural Affairs, 'Household Waste Bins: When and How Councils May Issue Fixed Penalties' (23 April 2018) <<https://www.gov.uk/guidance/household-waste-bins-when-and-how-councils-may-issue-fixed-penalties>> accessed 29 July 2021

-- 'Local Authority Collected Waste – Definition of terms' (23 September 2011) <<https://www.gov.uk/guidance/local-authority-collected-waste-definition-of-terms>> accessed 24 April 2022

Doherty J, 'EPR Could Fail over Financing, Warns Vanston' *Let's Recycle* (1 February 2022) <<https://www.letsrecycle.com/news/epr-could-fail-over-financing-warns-vanston/>> accessed 24 April 2022

-- 'No New EPR System for 2023, Defra Says' *Let's Recycle* (3 March 2022) <<https://www.letsrecycle.com/news/no-new-epr-system-2023-defra-says/>> accessed 24 April 2022

Eunomia Research & Consulting Ltd, 'Plastic Packaging - Shedding Light on UK Data' (Eunomia, 6 March 2018) <<https://www.eunomia.co.uk/reports-tools/plastic-packaging-shedding-light-on-the-uk-data/>> accessed 29 July 2021

European Commission Press Corner, *Questions & Answers: A European Strategy for Plastics* (Fact Sheet 16 January 2018) <https://ec.europa.eu/commission/presscorner/detail/sv/MEMO_18_6> accessed 29 July 2021

Greenpeace, 'UNPACKED: How Supermarkets Can Cut Plastic Packaging in Half by 2025' *Greenpeace* (London, 28 August 2020) <https://www.greenpeace.org.uk/wp-content/uploads/2020/08/Greenpeace_Unpacked_Report.pdf> accessed 29 July 2021

Hamilton L and others, 'Plastic & Climate The Hidden Costs of a Plastic Planet' (*Center for International Environmental Law*, May 2019) <<https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf>> accessed 29 July 2021

Islington London Borough Council, 'Recycling and Rubbish Container Guide' (Islington Council, 2021) <<https://www.islington.gov.uk/recycling-and-rubbish/recycling-and-rubbish-collections/recycling-and-rubbish-containers-guide/>> accessed 29 July 2021

Jowett P, 'Recoup Survey Calls for Focus on Plastic Film Recycling' *Resource* (London, 23 March 2021) <<https://resource.co/article/recoup-survey-calls-focus-plastic-film-recycling>>

Keating D, 'Blue, Yellow or White? Recycling Varies Widely in the EU' *Euractiv* (Brussels, 10 December 2020) <<https://www.euractiv.com/section/circular-economy/news/blue-yellow-or-white-recycling-varies-widely-in-the-eu/>> accessed 24 April 2022

Langley J, 'EPR Prompts Discussions on Consumer Costs' *Let's Recycle* (17 June 2021) <<https://www.letsrecycle.com/news/epr-prompts-discussions-on-consumer-costs/>> accessed 24 April 2022

London Assembly, Food and Rural Affairs, 'Single-Use Plastic Bottles' (Mayor of London, 2021) <<https://www.london.gov.uk/what-we-do/environment/waste-and-recycling/single-use-plastic-bottles>> accessed 29 July 2021

Slough Borough Council, 'Recycling - Contamination Frequently Asked Questions' (Citizen: Your E-Magazine from Slough Borough Council, April 2016) <<https://citizen.slough.gov.uk/april-2016/using-resources-wisely/recycling-contamination-frequently-asked-questions/>> accessed 29 July 2021

Smulian M, 'Councils Say Business Waste EPR Plans Will See Material Going Uncollected' *Materials Recycling World* (28 March 2022)

<<https://www.mrw.co.uk/news/councils-say-business-waste-epr-plans-will-see-material-going-uncollected-28-03-2022/>> accessed 24 April 2022

Snowden C, 'A Load of Rubbish? Introducing a Deposit Return Scheme to the UK' (*Institute of Economic Affairs*, 14 April 2019) <<https://iea.org.uk/wp-content/uploads/2019/04/SNOWDON-bottle-deposit-scheme-ED-1.pdf>> accessed 29 July 2021

Waste & Resources Action Programme, 'Key Findings from the Recycling Tracker 2020' (Waste & Resources Action Programme, 2020) <<https://wrap.org.uk/sites/default/files/2021-03/Key%20Findings%20from%20the%20Recycling%20Tracker%202020.pdf>> accessed 29 July 2021

Waste & Resources Action Programme, 'Municipal Waste Composition - England 2017' (January 2020) <https://wrap.org.uk/sites/default/files/2020-11/WRAP-National%20municipal%20waste%20composition_%20England%202017.pdf> accessed 24 April 2022

Zero Waste Scotland, 'Building a Circular Economy for Scotland: Evidence from Zero Waste Scotland activities 2012–2016' <<https://www.zerowastescotland.org.uk/sites/default/files/ZWS1378%20CE%20Narrative%20Report%20FINAL.pdf>> accessed 24 April 2022

-- 'Waste Composition Analysis Programme 2021-2024' (2021) <<https://www.zerowastescotland.org.uk/content/waste-composition-analysis-programme-2021-2024>> accessed 24 April 2022