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PLASTIC PACKAGING PLAN

ACHIEVING ZERO 'WASTE' EXPORTS

January 2019

This report follows a six month inquiry and was written by Jacob Ainscough, Research Fellow at Policy Connect.

Funding to support the work and expertise to inform our findings were generously provided by the Natural Environmental Research Council and Innovate UK with additional expertise provided by the wider UK Research and Innovation group.

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> The same properties that make plastics so versatile in innumerable applications – durability and resistance to degradation – make these materials difficult or impossible for nature to assimilate. Thus, without a well-designed and tailor-made management strategy for end-of-life plastics, humans are conducting a singular uncontrolled experiment on a global scale, in which billions of metric tons of material will accumulate across all major terrestrial and aquatic ecosystems on the planet.

Geyer et al. 2017, p. 293.

Foreword

Plastics are cheap, durable, and versatile materials that fulfil many useful functions in the modern economy. Yet this durability coupled with poor waste management means plastic pollution is now a major and increasing environment problem, as the Environmental Audit Committee's reports into microplastics[1], coffee cups[2] and plastic bottles[3] showed. As parliamentarians we strongly support slashing the UK's plastic waste pollution whilst simultaneously creating green jobs and growth in every nation and region of the UK.

This report from Policy Connect comes at a key time for plastic waste management in the UK. With public concerns at a high, ongoing discussion around the UK's separation from European Union regulations, and China shutting its doors, the need to act has never been more present. The Government's recent Resources and Waste Strategy (RWS) provides an ambitious blueprint[4]. We welcome the Secretary of State for Defra's (Department for Environment, Food and Rural Affairs) recognition that the UK will have to stop "offshoring our dirt"[5]. Achieving this ambition will require significant investment in domestic recycling. The range of government consultations due in 2019 will be crucial for ensuring the RWS leads to effective and well informed regulatory and policy changes.

The recommendations below build on the direction of travel set by the RWS, seeking to stretch its ambition for plastic waste. In particular, it proposes that the UK handles plastic packaging at home, rather than exporting over 4 Wembley stadiums full each year to countries with lower recycling and environmental standards. To drive action we require a bold target of net zero exports of recyclable plastic packaging by 2030 at the latest. This is the only way to ensure our plastic does not end up in the oceans and water courses. It is also an opportunity to create jobs and growth in the UK. As we seek to use more and more recycled content in our plastic packaging, having a ready stream of recycled material here in the UK will mean we can create a truly circular plastics economy.

The report was informed by bringing together authoritative experts in research, innovation, politics and industry with support from UK Research and Innovation. We recognise that there are strong, sometimes divergent, views across industry and society about plastics; but everyone shares the desire to change things for the better. This report reflects this common aim and makes specific, concrete recommendations for all stages of the plastics value chain. We support these recommendations as a vision for ongoing efforts across government and industry to create an approach to plastic waste that is evidence-based and stands the test of time.

The British are an ambitious people – it is time we made the most of this. The UK is already a world leader in material and recycling technology and with ongoing innovation, research and development we can transition from exporting our plastic problem to exporting home-grown solutions.

Anne Main MP
Conservatives
Member for St Albans, Chair of the All-Party Parliamentary Group on the Prevention of Plastic Waste

Rebecca Pow MP
Conservatives
Member for Taunton Deane

Lord Deben
Conservatives
Former Secretary of State for Environment, Chair of the Committee on Climate Change

Baroness Jenkin
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Anna McMorrin MP
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Labour
Member for Wakefield, Chair of the Environmental Audit Committee

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Matt Western MP
Labour
Member for Warwick and Leamington

Chris Williamson MP
Labour
Member for Derby North

Lord Teverson
Liberal Democrats
Chair of the Lords EU Energy and Environment Sub-Committee

Lord Smith
Cross bench
Former Chair of the Environment Agency

Geraint Davies MP
Labour
Member for Swansea, Member of the Environmental Audit Committee

Executive Summary

In December 2018, the Government released its Resources and Waste Strategy (RWS)[4]. The strategy outlines a progressive agenda for reforming our approach to the design, manufacture and re-utilisation of plastic packaging. The Government has committed to setting plastic packaging recycling targets at least in line with the European Union's Circular Economy Package, and to reforming the Extended Producer Responsibility scheme (EPR) as a matter of priority.

Of the 2,260 thousand tonnes of plastic packaging reported to be placed on the market in 2016, only 1,015 thousand were collected for recycling[6]. On-street recycling rates are particularly poor, with only 42% of local authorities providing on-the-go recycling[7]. Our reliance on overseas markets for the plastic packaging we throw away - i.e. what we throw away as rubbish - is shocking; if we gathered all the recyclable plastic packaging waste shipped abroad between 2010 and 2017 it would fill Wembley Stadium 26 times.

We commend the Secretary of State for Defra (Department for Environment, Food and Rural Affairs) for recognising that the UK will have to stop "offshoring our dirt"[5]. The sooner this is made a reality the better. A focus on low cost compliance for producers and access to international markets for low quality recyclate has seen us sleepwalk dangerously close to a crisis.

China shutting its doors to low quality plastic recyclate, and other countries looking to follow suit, has pushed up the timeline for the UK to get a handle on its own waste. We are now at a turning point.

Government and industry must now move forward with urgency to create a waste management system that empowers consumers to do their part. Innovations across industry and academia put us in a strong position to transition from exporting our discarded plastics to exporting ideas and solutions.

This report draws on expertise from across industry, government and academia to outline a coherent plan for combatting plastic packaging waste. We seek to build on the direction of travel established in the RWS and identify where ambitions can be pushed further. Section 3 outlines the future that we would like to see for plastic packaging; crucially, we want to see exports of plastic recyclate stop by 2030 at the latest. This will ensure our rubbish is not entering water courses around the world, and that we are retaining the value and benefits of this wonderful material.

Chapter 1 starts at the top of the waste hierarchy and focuses on cutting down on the amount of plastic we use in the first place.

By some estimates, the UK uses 3.3 million tonnes of plastic packaging annually[8]. At 50kg for each person in the country this is far above the European Union average of 31kg[9].

Whilst industry efforts to cut down on packaging should be applauded, these efforts have been cancelled out by our ever-increasing demand for convenience pre-packaged goods. Per capita plastic packaging use is stuck, regardless of continuous efforts to use less and make it lighter[10]. Consumers need greater power and choice to decide how much packaging is too much. Our recommendations focus on increasing the voice of the public in this debate and the availability of zero or reusable packaging options. However it is essential that efforts to reduce packaging use consider the vital role that packaging, and plastic in particular, play in protecting goods and avoiding food waste.

Under half of plastic packaging placed on the market in 2016 was collected for recycling[11]. This means that the rest ended up in landfill, incineration, or was simply littered in the environment.

Chapter 2 focuses on getting plastic out of the residual waste stream and into the hands of recyclers and reprocessors who can keep its value in the economy.

This is not a simple task. Capturing packaging is only worthwhile if it has been well designed to match the reprocessing infrastructure we have in the UK. We offer a comprehensive plan to reform producer responsibility in this country, ensuring producers design their packaging with the end-of-life in mind. Targeted investment is needed to bring forward innovations in material design and reprocessing technologies. Compostable material and chemical recycling are two areas that are set to make an impact.

The public have to do their bit by disposing of their plastic waste responsibly both in the home and on-the-go. Industry, national government and local authorities must work together to help consumers who want to do the right thing, and bring on board those that do not currently recycle. Recycling needs to be simpler for consumers; collections must become more consistent nationally, communication and labelling must improve, and on-the-go recycling infrastructure needs a boost. Enforceable local targets and new incentives to encourage household recycling will help to ensure that no packaging waste is unnecessarily burnt or sent to landfill. It is vital that Westminster works with devolved administrations to develop an approach that delivers for the whole country.

Chapter 3 seeks to wean us off reliance on low quality plastic recyclate export by boosting recycling here at home. This means drawing on existing innovation and investing in jobs and growth in the UK waste management sector. The final deadline for reaching net zero export of plastic recyclate should be set at 2030. The Government must ask the National Infrastructure Commission to carry out a study to identify the investment and infrastructure needed to achieve this ambitious goal.

This investment will depend on having strong markets for recycled plastics. Many producers are already looking to boost the amount of recycled materials they use and the proposed recycled content tax will help drive this trend. This tax would be greatly improved if it took into account current availability of different polymer types, and had a mechanism to ratchet up the target percentage as recycling improves.

Achieving a positive outcome for all used plastic packaging requires input from Government, industry, researchers and consumers. Many actors across the plastics value chain are already looking to play their part and drive this agenda forwards.

This holistic strategy supports and adds coherence to these multi-agency efforts, at the same time as making sure no-one can free-ride on the efforts of others.

Our original research owes much to pre-existing work on this topic. By bringing these ideas together we are providing ambitious but necessary steps and standards needed to take control of and boost our waste economy, jobs and innovation market, and ultimately stop waste plastic from damaging the environment we all live in.

...instead of recycling it ourselves!

BETWEEN 2010–17 WE EXPORTED

4.15M TONNES OF PLASTIC PACKAGING

2017 WASTE EXPORTS

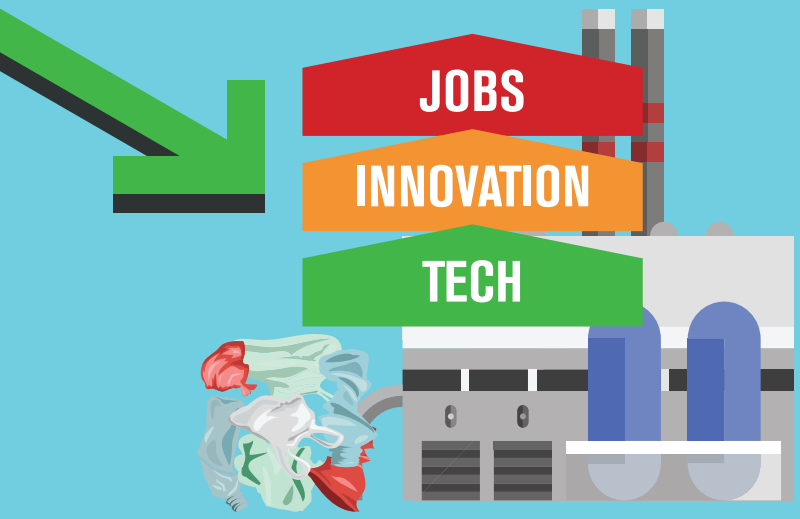
HAD THE SAME CO_2 EMISSIONS AS

45,000 CARS

IN 2016 OVER 1/2 OF PLASTIC PACKAGING ENDS UP IN LANDFILL, INCINERATION, OR AS LITTER

THAT'S ENOUGH TO REACH LONDON TO BEIJING 3.7 TIMES

FILL WEMBLEY STADIUM UP 26 TIMES OVER



WE NEED AT LEAST 3 TIMES AS MANY RECYCLING PLANTS

WHAT MUST WE DO?

Develop a Plastic Packaging Plan with:

- 2030 net zero export target
- Easier packages for consumers to recycle
- Investment in British waste economy, infrastructure and jobs
- Large retailers show leadership in packaging design and recyclability
- Plastic Packaging Taskforce

Recommendations

Cutting down plastic use

Recommendation 1: Establish a Plastic Packaging Taskforce within the Environment Agency, funded through registration fees for packaging compliance schemes.

Recommendation 2: Enforcement of the Packaging (Essential Requirements) Regulations should be transferred from Trading Standards to the Environment Agency Plastic Packaging Taskforce.

Recommendation 3: Large retailers should demonstrate leadership by introducing zero packaging or reusable packaging options for appropriate products.

Setting ambitious targets that provide future certainty to industry

Recommendation 4: Following the model of the Climate Change Act, gradually-increasing targets for recycling levels should be set urgently by Defra; at minimum in line with the European Union Circular Economy Package. To provide stability and certainty to industry and investors these targets should be fixed in law and stretch to at least 2035.

Aligning packaging design and reprocessing infrastructure

Recommendation 5: The Environment Agency Plastic Packaging Taskforce should work with industry to publish an 'approved list' of packaging materials and formats and develop protocols for updating this as technology advances.

Recommendation 6: The extended producer responsibility (EPR) system should be reformed to ensure local authorities, packaging schemes and waste managers work with shared objectives.

Recommendation 7: The government should introduce increasing statutory minimums for the amount of domestic reprocessing producers must support, with a view to supporting 100% domestic reprocessing by 2030 at the latest.

Recommendation 8: Industry should support and commit to co-invest in the proposed Smart Sustainable Plastic Packaging Industrial Strategy Challenge Fund to bring to market innovations in new materials, and new sorting and recycling technologies.

Recommendation 9: The government should work to support the establishment of chemical recycling, including urgently reclassifying outputs to give them end-of-waste status.

Waste collection: ensuring clean, high value plastic recycling streams

Recommendation 10: EPR funding for local authorities should be made conditional on them achieving recycling targets and implementing a collection consistency framework.

Recommendation 11: Local authorities and central government should explore new approaches for encouraging higher household recycling rates.

Recommendation 12: Recycling labels should be mandatory for packaging of all goods sold into the UK market.

Consumers on-the-go: closing the loop outside the home

Recommendation 13: Sustained, long-term pro-recycling and anti-littering communication campaigns should be a priority use for new EPR funds. These should be coordinated between the Environment Agency Plastic Packaging Taskforce and WRAP's established 'Recycle Now' campaign.

Recommendation 14: Westminster should work with devolved administrations to introduce a world-class UK-wide Deposit Return Scheme (DRS) focused on plastic beverage containers by 2021.

Dealing with our own mess

Recommendation 15: A target of net zero export of plastic packaging collected for recycling should be set for 2030 at the latest.

Recommendation 16: The government should invite the National Infrastructure Commission urgently to assess the future infrastructure needs to deal with our own packaging waste in the UK in the most environmentally sound way possible.

Recommendation 17: The point at which material is allowed to be classified as recycled should be changed to after reprocessing, including for any exported material.

Recommendation 18: The Treasury should set the percentage of recycled content target for their proposed tax at different levels for different packaging formats, depending on the availability of recycled material. The Treasury should devise a protocol for periodically revising these target percentages upwards as recycling improves.

INTRODUCTION

Plastic packaging waste: how are we doing?

This report is the culmination of the Zero Plastic Waste project; a project carried out by Policy Connect with support and expertise provided by UK Research and Innovation (UKRI). UKRI engagement is through the Natural Environment Research Council (NERC) and Innovate UK, to bring together authoritative experts in research, innovation, politics and industry. UKRI is in the unique position of sponsoring a broad range of research and innovation that can contribute to solving the plastic waste problem. It has invested £140m over three years into sectors as diverse as chemistry and the circular economy.

Through this project, Policy Connect sought to devise a strategy for significantly reducing the quantity of mismanaged plastic packaging waste in the UK, with a specific focus on England as by far the biggest contributor to plastic packaging waste. It should be acknowledged that waste policy is largely a devolved matter and cross administration and cross agency working is essential.

We drew upon a wealth of research and reports from a large number of organisations, as well as primary data collected through one-to-one interviews and round table discussions with experts from industry, academia, government, and NGOs. A total of 32 interviews were undertaken between September and November 2018. To discuss issues in more detail, two parliamentary round tables were held in October 2018. A full list of documents reviewed and organisations consulted and details can be found in Appendix 1. Details of the two round tables can be found in the contributions.

What's the issue with plastic packaging?

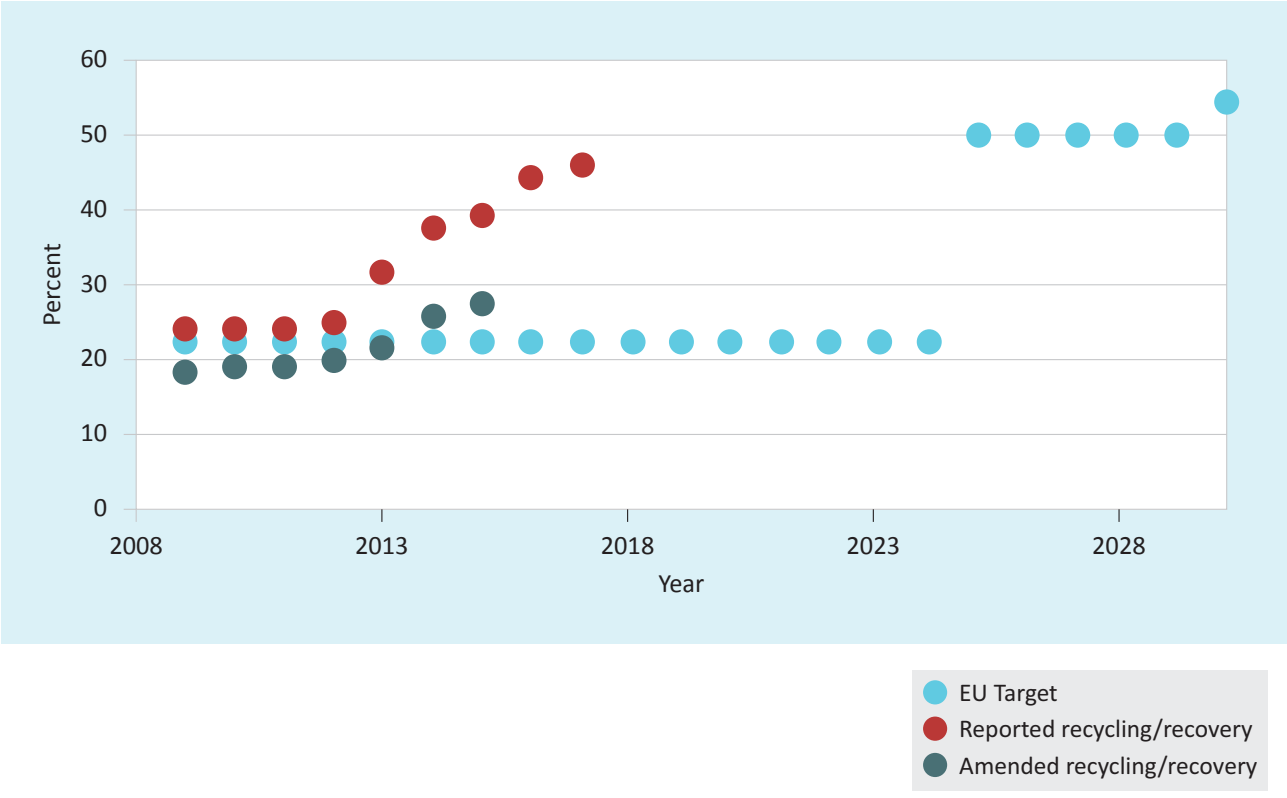
Nothing is necessarily 'wrong' with plastic packaging. In many cases it is the lightest, cheapest and most environmentally-friendly option for packaging goods. Yet all too often it escapes into the environment, where it can remain for hundreds of years causing serious damage to wildlife. The David Attenborough 'Blue Planet II' series has brought this home very starkly. Globally, packaging accounts for 43% of the 7.3 billion tonnes of non-fibre plastic ever made[12]. Of all plastic ever produced approximately 60% has been discarded either to landfill or the wider environment[12], with an estimated 4.8 to 12.7 million tonnes entering the oceans in 2010 alone[13]. We are performing what Geyer et al. (2017) call a "singular uncontrolled experiment on a global scale" (p. 21); echoing language from the early days of the climate change debate when Ramanathan (1988) described emissions since the industrial revolution as an "inadvertent global experiment" (p. 293).

> There is a reason we moved to plastics, but we've let it become a problem and we now need to work out where plastics are the best option, and why they are the best option.
>
> Margaret Bates, University of Northampton

Current European Union targets for plastic packaging (under the Packaging and Packaging Waste Directive and Circular Economy Package) are **22.5%**, rising to **50%** by 2025 and **55%** by 2030. There is also a European Union target of **50%** for household recycling across all materials by 2020.

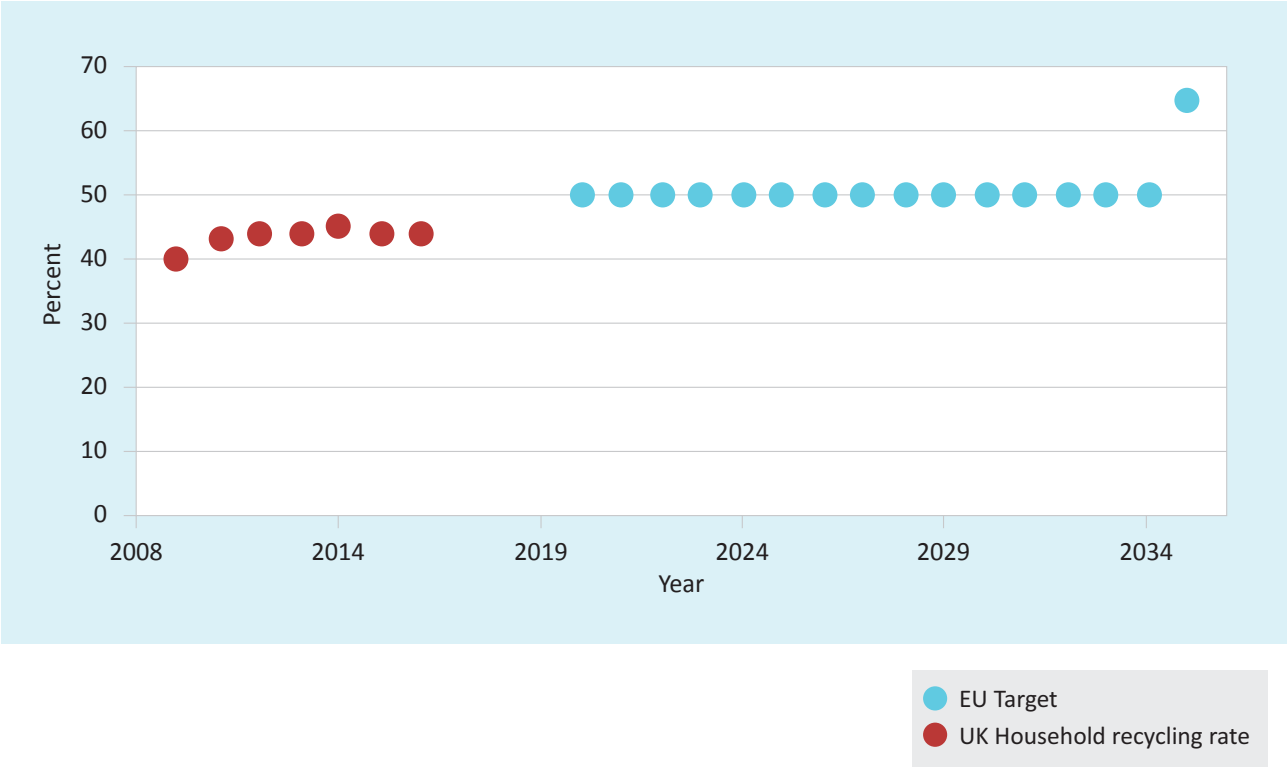
According to official statistics, the UK has consistently met its recycling and recovery targets for plastic packaging waste (see Figure 1). These figures are based on self-reported data from those placing plastic packaging on the market. There are concerns that the true amount of packaging is under-reported, and Figure 1 also shows amended recycling rates based on independent analysis of waste stream composition[8]. This picture is likely to be significantly more realistic and is much less rosy.

Figure 1. Recycling or recovery rates for plastic packaging (reported and amended) against European Union targets[3]



After significant progress in the UK from 2000, household recycling rates have plateaued since 2010. The only exception to this is Wales, where the 50% target has been achieved.

Figure 2. UK household recycling rates across all materials against European Union target



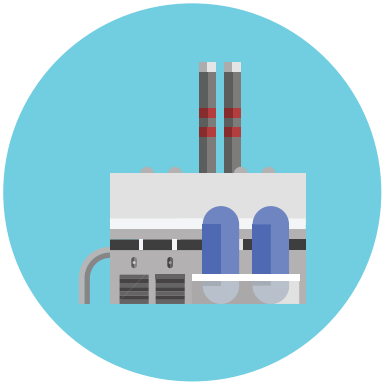
We envision a future where...

Zero plastic packaging ends up in to the environment or the residual waste stream

Zero recyclable plastic packaging is exported for processing abroad by 2030

The all plastic packaging formats are readily recyclable or compostable in the UK

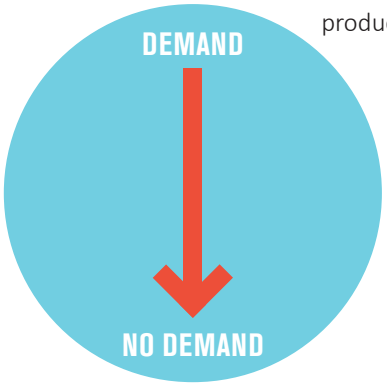
All councils collect the same types of plastic packaging



Market demand for recycled plastic in products

Consumers make environmentally sound decisions regarding product packaging

Non-package or reusable package options are the norm in supermarkets for suitable goods



There is declining demand for virgin polymers in packaging applications

CHAPTER ONE

CUTTING DOWN PLASTIC USE

What are the issues?

It is currently illegal to over-package products in the UK and much work has been done by industry to reduce packaging over the years. Reducing packaging can either take the form of 'light-weighting' (cutting down the amount of material used to package a good) or switching to zero or reusable packaging options. Although progress has been made, increased consumption of pre-packaged goods has offset gains from light-weighting — leaving per capita packaging use in effect stuck for a decade[10].

The limits to light-weighting: Light-weighting packaging has driven the growth in plastic use over heavier materials, helping to decrease the environmental impact of transportation and wastage. Light-weight plastic packaging has been vital to the work the Waste & Resources Action Programme (WRAP) has done with industry, under the voluntary Courtauld Commitment, to reduce food waste through packaging innovation. Yet this trend has caused a new global environmental issue in the form of plastic pollution. Light-weighting can negatively affect recyclability as multi-layer composite packaging is often the lightest, but also hardest to recycle. Some suggest that packaging practices can actually drive up food waste due to aesthetic or size requirements or because of deliberate packaging to encourage over purchasing[16]. On top of this, the regulations that make over-packaging illegal are intrinsically weak as they contain a 'consumer acceptability' clause that allows over-packaging for commercial purposes. Finally, they are overseen by Trading Standards who lack the resources or inclination to enforce them.

Barriers to the removal of packaging: There are clear limits to the range of products suitable for zero packaging or reuse options. Retailers must consider the impact on shelf life, loss from spillage, increases in transportation packaging, and hygiene and contamination issues. The energy embodied in products, particularly food, is often significantly greater than for packaging; making over-packaging less environmentally harmful than under-packaging if this leads to wastage. Zero packaging options also require customers to bring their own containers, weigh out their purchases, wait longer to be served, and often visit multiple stores. In some instances, though not always, zero packaging options are more expensive. Cost and convenience are known to be major drivers for customers, creating a potential barrier to zero or reusable packaging approaches.

What can we do?

Eliminating plastic packaging without changing consumption behaviours may just create higher environmental costs through spoilage and transport emissions. We therefore recommend a mixture of strategies:

Increasing the public voice to drive light-weighting: Industry should be recognised for leading the way here, but more can be done to light-weight packaging through redesign and material innovation. While there are many functional properties to consider, products are still packaged for commercial reasons; either to increase their appeal or to compel consumers to buy more than they need. This is fundamentally a matter of public acceptance: what is the public willing to accept in terms of packaging? The Packaging (Essential Requirements) Regulations 2015 provide a legal framework to increase the voice of the public in this debate. We suggest passing responsibility for this legislation from Trading Standards to a properly resourced Environment Agency '**Plastic Packaging Taskforce**' in England. This team could be funded out of packaging scheme registration fees under a renewed producer responsibility system (see Box 1, p.23). Much waste policy is devolved in the UK, and it would be vital for the taskforce to work with the relevant agencies in devolved administrations.

Promoting wider choice for consumers: There is a fledgling market for bulk food options in the UK, with significant capacity to expand and experiment with alternative delivery modes. Whilst accepting that not all goods can be supplied in this way, expanding these options may help to drive a cultural change away from the current packaging-heavy, throw-away norm. Many packaging choices are made further up the value chain and bulk food stores face a challenge in sourcing low packaging options. The Government has already pledged to support the introduction of zero packaging supermarket aisles in their 25 Year Plan for the Environment[17]. The onus is now on large retailers to bring their market power to this space and introduce zero packaging or refill options where appropriate. We welcome commitments in the RWS to develop guidance for supermarkets looking to reduce packaging without increasing food waste. The move in some towns towards more local, town-centre food outlets (along the lines of continental markets) should also be taken into account to ensure no barriers to their development are inadvertently introduced.

Recommendation 1: Establish a Plastic Packaging Taskforce within the Environment Agency, funded through registration fees for packaging compliance schemes.

Recommendation 2: Enforcement of the Packaging (Essential Requirements) Regulations should be transferred from Trading Standards to the Environment Agency Plastic Packaging Taskforce.

Recommendation 3: Large retailers should demonstrate leadership by introducing zero packaging or reusable packaging options for appropriate products.

CHAPTER TWO

GETTING PLASTIC OUT OF THE RESIDUAL WASTE STREAM

2.1. Setting ambitious targets that provide future certainty to industry

Of the 2,260 thousand tonnes of plastic packaging on the market in 2016, only 1,015 thousand were collected for recycling[6]. This means that over half ended up in landfill, incineration, or simply littered in the environment.

Getting plastic packaging out of the residual waste stream will require coordination across the whole value chain – from producers through to waste managers; with consumers playing their part. The UK Plastics Pact, managed by WRAP[18], is a major initiative which aims to promote just such coordinated action. Round table participants also suggested that communication across the plastic supply chain is improving. Well-designed policy and regulation can bolster this voluntary action and ensure that no businesses free-ride off the hard work of others.

Long range, ambitious recycling targets are a key first step to ensure the whole value chain is working together. To provide a stable framework for industry and communities, these targets should be set in law. Our fourth recommendation is simple:

Recommendation 4: Following the model of the Climate Change Act, gradually-increasing targets for recycling levels should be set urgently by Defra; at minimum in line with the European Union Circular Economy Package. To provide stability and certainty to industry and investors these targets should be fixed in law and stretch to at least 2035.

The next three sections cover our approach to ensuring plastic is collected for recycling and does not find its way to landfill or incineration.

2.2. Aligning packaging design and reprocessing infrastructure

What are the issues?

An outdated producer responsibility system: To make sure that recycling or recovery is economically viable, plastic packaging needs to be designed with the end of its life in mind. A key tool for ensuring producers think about what happens to packaging after it is used is an Extended Producer Responsibility (EPR) scheme. A well designed EPR scheme internalises costs associated with dealing with end of life, so that these are covered by those that bring it to market, i.e. the 'polluter pays' principle. Product brands and retailers have most control over the design of packaging, so making them responsible for it will ensure the end of life is considered in the design phase. That said, the cost of compliance is reflected in the price of goods purchased, meaning 'responsibility' is actually shared between the supplier and the consumer.

The first UK producer responsibility legislation was introduced in 1997 and was last updated in 2016. In line with the zeitgeist of the 1990s the UK opted for a market-based approach; the Packaging Recovery Note (PRN) system. PRNs are evidence of recycling created by registered reprocessors or exporters of recyclate (exporters produce 'packaging export recovery notes' (PERNs) that are equivalent to PRNs). All 'obligated producers' - those that handle above 50 tonnes of packaging and have an annual turnover of above £2million a year - are required to purchase PRNs/ PERNs to cover the amount of packaging they handle.

This system creates a market for PRNs/PERNs, with the price of evidence varying with supply and demand. The majority of producers meet their obligations by joining a compliance scheme that purchases evidence on their behalf. There are currently approximately 30 schemes in the UK, some take an active approach to improve recycling whilst others simply aim to achieve compliance at least cost. Unlike some schemes in European Union countries, the cost of compliance is spread across actors in the supply chain, not purely on those selling to end consumers. A number of widely recognised issues mean the current system is no longer fit for purpose (see Box 1). We are glad to see that Defra is committed to reforming the producer responsibility system as part of their RWS[4].

Problematic packaging formats: Yet even if producers consider the end of life when designing packaging, some packaging formats simply aren't economically recyclable as things stand. Multi-layer plastic film and composite materials such as Tetra Pak® can be particularly difficult to recycle.

> **We've started to facilitate more collaborative conversations between producers, retailers, other brands and the waste industry – so everyone is aligned and we can start to move to a more circular system.**
>
> Emma Cook, Ella's Kitchen

Box 1. Reforming the EPR system

What's wrong with the current system?

1. The cost of compliance is not connected to the cost of dealing with the waste, and sale of PRNs/ PERNs typically covers only 10% of the total cost[19]
2. The system ceases to raise funds once recycling targets are reached in a given year
3. Fluctuations in PRN/PERN prices make it difficult for reprocessors to make investment decisions[19]
4. Competition is between organisations with only limited ability or incentive to affect the cost or quality of recycling
5. PRNs and PERNs are treated as equivalent and auditing of exported recyclate is difficult, effectively incentivising low-quality export
6. Low compliance costs don't encourage businesses to engage with the recycling sector, with some simply seeing compliance as a 'tax' to be paid once a year and then forgotten about
7. The spending of compliance funds is considered 'opaque', as reprocessors have a number of broad categories under which they may report their PRN revenue spend. The Environment Agency lacks the capacity to force reprocessors to even report at this level
8. Under-resourced auditing and monitoring of the system allows for fraud and other criminal behaviour, exacerbated by increases in organised crime in the sector
9. Having a weight-based system drives light-weighting above other design criteria.

How could it be improved?

1. The market-based PRN system should be replaced with a direct payment model, where the cost of compliance is directly linked to the cost of reprocessing
2. The supply chain should be made responsible for 100% of the net cost of collecting, sorting, reprocessing, and/or disposal of plastic packaging. The net cost of reprocessing will decrease as the value of recycled material increases through cleaner recycling streams and stronger end markets
3. Compliance fees should be higher for hard-to-process formats
4. Funds from the EPR system should be directed to improve the quality of recyclate. This includes public communication campaigns, improving collection consistency, and investing in sorting and reprocessing infrastructure. This will require giving a significant proportion of EPR fees directly to local authorities (this should be subject to certain conditions, as outlined below)
5. Producers should be obligated to support the costs of an escalating percentage of domestic processing, to be ratcheted up as domestic processing capacity increases
6. To improve oversight and enforcement capacity, compliance schemes should pay an annual registration fee to the Environment Agency. This would fund the Plastics Packaging Taskforce
7. The Environment Agency Plastics Packaging Taskforce should monitor and audit compliance schemes, and help to facilitate communication between schemes, local authorities and the waste management sector. The taskforce should also oversee national communications spend and the 'approved list' of materials and formats, working with partner agencies in devolved administrations where appropriate.

What can we do?

Reforming EPR: Retaining material and value in the economy means helping producers understand what 'good' design is. To increase clarity for all those in the value chain an 'approved list' of plastic packaging materials and formats should be published (as suggested by WRAP and others[20]). This list should be designed in consultation with producers and waste managers and built on existing assessment tools[21]. Such a list could also be used to limit the variety of packaging formats on the market; a current source of confusion for consumers. New materials and formats should only be added when there is the infrastructure to deal with them or there is a strong case to include them to drive infrastructure investment. This 'approved list' should be enforced through modulated EPR fees.

> **Manufacturers can move much quicker than the recyclers who have to deal with it. You have to give time for collection and processing infrastructure to catch up.** Roundtable participant

An improved compliance system would ensure better recycling was the only way to reduce compliance costs. This would drive competition between compliance schemes, encouraging them to work with local authorities and waste managers to improve the quality of recycling steams and UK infrastructure. The new system is an opportunity to boost the domestic reprocessing industry and reduce our dependence on international markets. We have laid out details of our recommendations for a renewed EPR scheme in the inset box (Box 1). In addition, the devolved administrations must be involved in discussions around EPR reform so as to address local authority funding implications.

Supporting innovation: Partnerships between industry and academia are vital to create the packaging and reprocessing technologies of the future. The Smart Sustainable Plastic Packaging Industrial Strategy Challenge Fund could be a key vehicle in promoting cross industry/academia collaboration[a]. Further funding and commitment from industry is vital for bringing new ideas to market. One promising new technology is chemical recycling; a solution to turn unrecyclable plastics into good-as-new polymers for manufacturing. This technology is fast approaching readiness for wide scale deployment and government should be making regulatory preparations for that point[22].

Recommendation 5: The Environment Agency Plastic Packaging Taskforce should work with industry to publish an 'approved list' of packaging materials and formats and develop protocols for updating this as technology advances.

Recommendation 6: The extended producer responsibility (EPR) system should be reformed to ensure local authorities, packaging schemes and waste managers work with shared objectives.

Recommendation 7: The government should introduce increasing statutory minimums for the amount of domestic reprocessing producers must support, with a view to supporting 100% domestic reprocessing by 2030 at the latest.

Recommendation 8: Industry should support and commit to co-invest in the proposed Smart Sustainable Plastic Packaging Industrial Strategy Challenge Fund to bring to market innovations in new materials, and new sorting and recycling technologies.

Recommendation 9: The government should work to support the establishment of chemical recycling, including urgently reclassifying outputs to give them end-of-waste status.

[a]At time of writing ISCF SSPP bid still subject to Government approval and industry match funding.

2.3. Waste collection: ensuring clean, high value plastic recycling streams

What are the issues?

Excessive variety in collections: Household collection is the responsibility of local authorities and varies significantly across the country. Some local authorities contract out this service whilst others manage collection in-house. Collection and processing (see below) may be carried out by the same organisation; however, it is not uncommon for these to be separated.

Local authorities that outsource waste management to the private sector often have separate contracts for collection, processing and disposal. Processing and disposal contracts can be upwards of ten years long and linked to infrastructure investment. All contracting decisions and infrastructure investments are based on the local authorities' specifications, leading to significant variation in services and available infrastructure from area to area.

Collections vary both by the sorting system and the types of materials that are accepted. In England, 50% of households have single stream co-mingled recycling, 33% have two streams (with glass or card/paper separated out), and 23% have fully home-sorted multi-stream collections[23]. The vast majority of local authorities (99%) now collect plastic bottles for recycling, and 72% collect pots, tubs and trays (PTTs)[23]. Far fewer currently collect plastic film. These systems have different benefits and are appropriate for different housing types. The less sorting and cleaning a recycling stream requires the higher the value; leading some to prioritise a separated-at-source system. However, some local authorities choose a co-mingled system as these are easier for consumers and typically have a higher capture rate.

Limits to recycling rates are now being reached due to a combination of some areas not offering recycling for all plastic packaging types and some people not engaging with the recycling services that are available. This lack of engagement may be due to apathy about recycling or confusion over the correct receptacle for different packaging types. Some respondents suggested the variety in collection regimes leads to significant confusion amongst the public. However, others have claimed this confusion primarily results from the array of different packaging materials and formats on the market[24]. Variety in collection regimes and packaging formats also makes it more difficult to have clear on-pack labelling, with the widely used On-Pack Recycling Label (OPRL) having to classify many formats as 'check locally', which respondents suggest many consumers are unlikely to do.

Targets for recycling of plastic waste are set at a national level in England, with no specific targets for local authorities. Local authority recycling performance for 2016/17 varied between 14% and 65% for England[25].

Sticky contracts: Long term contracts are important, as guaranteed waste streams allow waste management companies to invest in infrastructure. However, they can create a lock-in, stopping authorities from being able to alter the services they offer without paying significant fees to break contracts before they expire.

Contamination: Another major issue with plastic packaging recycling collections is food waste contamination. Such contamination significantly lowers the value of the recyclate. Contaminated recycling streams also decrease the possible end uses for the recycled material: for example, plastic going into food-grade applications has to come from clean sources.

What can we do?

Consistent collections: Increasing clarity for consumers is vital to improving collections. This means reducing diversity in terms of both materials collected and collection systems. A framework for improving consistency already exists[26] but there is no mechanism for enforcing this in England. The Government has also announced a consultation on collection consistency as part of the RWS4. The consistency framework should be mandatory and funding from the EPR scheme should be conditional on local authorities acting in line with the framework. National plastic packaging recycling targets should be translated into enforceable local authority targets (as is done in Wales) – these should account for any material diverted through a Deposit Return Scheme (see below). We suggest funding should only be withdrawn if a local authority fails to comply with the framework when renewing or amending contracts. Allowing contracts to transition naturally will ensure existing infrastructure is not made redundant and allow local authorities to take advantage of the latest technology. This will also give time for end markets to develop for an increased flow of recycled material. Food waste collection should be mandatory to help improve the quality of plastic recycling streams. This is increasingly important as targets for recycled content in plastic packaging are introduced. Devolved administrations must be engaged on issues of local authority funding.

> **Unambiguous labelling should be the key end point because it depends on the whole system. If we can't get that, we have created a system that suits industry, not citizens.** Roundtable participant

New approaches to increase household recycling: One of the most effective means local authorities currently have to compel residents to recycle is to limit the frequency of residual waste collections. Many authorities have used this approach in recent years, although it has proven politically unpopular in some areas. We suggest all local authorities should explore other ways to restrict residual waste generation; either through reduced frequency of collection or lower volume residual waste containers. To further assist them in meeting recycling targets, the UK Government should consider consulting on legislation allowing local authorities to charge households based on the residual waste they produce. This would replace the current flat rate paid through council tax. Such charging systems have been implemented successfully elsewhere in Europe[27]. A county in Germany slashed residual waste per person in half within 5 years of implementing a weight based scheme[28].

Recommendation 10: EPR funding for local authorities should be made conditional on them achieving recycling targets and implementing a collection consistency framework.

Recommendation 11: Local authorities and central government should explore new approaches for encouraging higher household recycling rates.

Recommendation 12: Recycling labels should be mandatory for packaging of all goods sold into the UK market.

Improved communication: EPR funded communication campaigns to improve public awareness and participation in household recycling should be carried out at national and local levels, coordinated by the EA Plastic Packaging Taskforce. Recycling labelling should also be made mandatory for all plastic packaging sold in the UK market.

> **Pay-as-you-throw would give local authorities another tool to encourage people to recycle by placing a direct financial incentive to do so on the individual.** Antony Buchan, LWARB

2.4. Consumers on-the-go: closing the loop outside the home

What are the issues?

Contaminated collections: Consumers are an essential part of the plastic circular economy and were identified by one participant as the 'weakest link' in the chain. Increasingly, people interact with packaging on-the-go, where they are far less likely to correctly dispose of it and much ends up littered.

Marine Conservation Society data from 2016 shows that plastic fragments are the most common item found during beach litter picks (45.8% of total). Items such as food packets, caps and lids, and plastic drink containers were also in the top 10 most common item types[29]. In 2017/18, 60% of sites surveyed by Keep Britain Tidy had litter from confectionary packs, 52% had soft drink packaging litter, and 33% had fast food-related litter[30]. RECOUP reports that only 42% of local authorities currently offer on-the-go recycling collection infrastructure nationally[31].

Lack of local authority funding: Incorrectly disposing of waste on-the-go happens due to poor infrastructure and a lack of a social convention against littering or misusing on-the-go recycling bins. This leads to littering and high levels of contamination, especially in tourist or nightlife hot spots[32]. High levels of contamination means offering on-the-go recycling simply isn't economically viable for many local authorities, which explains why it is rarely prioritised. Lack of funding also means authorities are often not able to invest in communication and education campaigns necessary to reduce contamination.

What can we do?

Improved communication and education: Changing on-the-go recycling behaviour requires a combination of improved infrastructure, consistent messaging about recycling and littering, and clear on-pack labelling. Ultimately, littering must become socially unacceptable behaviour that people do not wish to be seen doing. We recommend anti-littering specific national advertising campaigns funded through the communications arm of the EPR scheme. This work should be coordinated between the EA Plastic Packaging Taskforce and WRAP's established 'Recycle Now' campaign[32], working closely with local authorities and established third sector campaign groups.

There is a wealth of pre-existing research carried out by different bodies regarding recycling behaviour and effective communication. At time of writing, a city-wide trial was underway in Leeds to assess options for improving on-the-go recycling. This scheme, 'Leeds-by-example', is using a combination of advertising campaigns and colourful, interactive recycling bins to stimulate behaviour change. Within three weeks, the campaign decreased contamination of on-the-go recycling from 42% to 27%[33]. Previous research and results from 'Leeds-by-example' are likely to be useful for other local authorities seeking to address littering and on-the-go recycling.

A Deposit Return Scheme: We support a well-designed Deposit Return Scheme (DRS) focused on plastic beverage containers as a key tool to improve on-the-go recycling. Initial start-up costs for a scheme will be high, however these should be considered both in terms of recycling improvements and litter reduction benefits. A well-designed DRS produces a very clean recyclate stream and in turn a high quality recycled material. This will be essential for meeting increased demand for such material due to the announced minimum recycled content tax. Defra's commitment to a DRS in the RWS is welcome, but we believe this scheme should be introduced by 2021 at the latest.

Several issues must be considered in the design of a DRS system:

1. The system should cover the whole of the UK
2. Accessibility to the system by different sections of the population must be assured
3. The impact on local authority recycling revenue and ability to meet targets needs to be accounted for in future funding and recycling targets
4. Deposit sites should be positioned so as to not benefit larger stores over smaller stores, potentially with on-street as well as in-shop sites.

There is a concern that a DRS can end up redirecting high value polymers from local authority collections. This potential cost to local authorities can be offset through increased revenue from EPR fees. Local recycling targets should also be set lower than national targets to account for any material lost to local collections as a result of DRS.

> **There could be a risk that you cream off the high value material, making it more difficult for individual local authorities to still achieve high tonnage based recycling rates.** Antony Buchan, LWARB

Recommendation 13: Sustained, long-term pro-recycling and anti-littering communication campaigns should be a priority use for new EPR funds. These should be coordinated between the Environment Agency Plastic Packaging Taskforce and WRAP's established 'Recycle Now' campaign.

Recommendation 14: Westminster should work with devolved administrations to introduce a world-class UK-wide Deposit Return Scheme (DRS) focused on plastic beverage containers by 2021.

CHAPTER THREE

DEALING WITH OUR OWN MESS

What are the issues?

Waste management involves the sorting and reprocessing, recovery, or disposal of post-consumer waste. Unless separated at source, recycling is passed through a material recovery facility (MRF) to sort it into different recycling streams. This is then compressed into bales and taken to a reprocessing plant or exported. The majority of plastic that enters the residual waste stream will go to landfill or incineration for energy from waste (EfW) either in the UK or abroad. The main waste processing options are outlined on the following page. Whilst many issues at this stage are caused further up the chain, there are a number of factors as to why UK reprocessing is lagging behind.

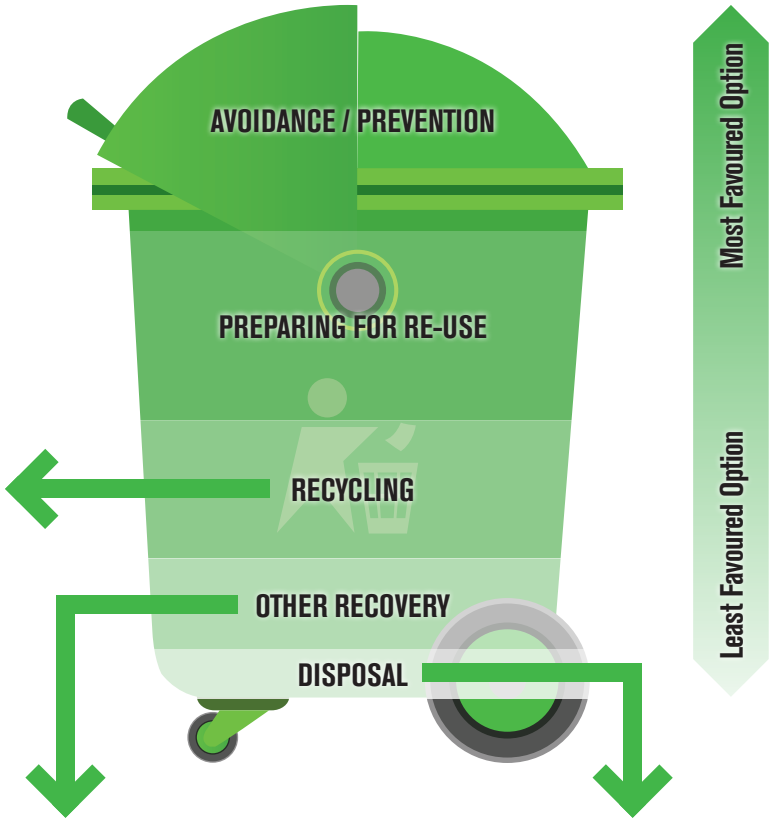
Addicted to exports: Until recently export markets for low quality plastic recyclate were readily available. In the first three quarters of 2018 approximately two thirds of plastic packaging waste collected for recycling in the UK was exported (64%)[11]. The vast majority of recyclate waste exported from the UK and other high income countries has historically gone to China[34]. There have been concerns for some time about the quality of exported recyclate and the ability of China to properly deal with it[34,35]. Following their earlier clampdown on low quality plastic imports in 2013, China announced a permanent ban in early 2018. This ban has forced many exporting countries to look to other Far Eastern markets with even less developed waste management infrastructure. Exporting material has a number of disadvantages compared to domestic processing, including: lack of oversight over where material ends up, exposure to market fluctuations, and loss of value of the material to the UK economy.

Poor data: Recycling is currently measured at the point that the processor or exporter takes control of the material. This does not account for the quality and actual recyclability of the material and can artificially inflate perceptions of recycling levels. Reforming how recycling rates are measured would strip exporting of its unfair advantage and force improvements in domestic reprocessing capacity in order to meet targets.

Lack of end markets: Both demand and supply are relatively low for many recycled polymers, holding back the UK reprocessing sector. High levels of contamination in recyclate streams make it difficult to produce recycled polymers of sufficient quality economically. This creates a double barrier for producers wishing to switch from virgin to recycled material: the cost is often higher and it is difficult to secure a reliable supply of high-quality recycled material. Oil prices also play a major role in determining the cost of virgin polymers, and therefore the attractiveness of recycled content. For mechanical recycling, there is a limit to the number of times that a polymer can be reprocessed and often recycled plastics end up in lower grade applications such as plastic timber. Such applications are preferable to landfilling or incineration, but these products are rarely recycled themselves and this so-called 'down-cycling' does not fit the principles of a circular economy.

The need for a back-up: Waste processing has a high cost of failure, therefore there is the need for 'infrastructure of last resort' to ensure that the UK can handle its waste processing needs. EfW currently plays this role, however, while it is preferable to landfill, EfW is a carbon source and should not be seen as an ideal solution. As we get better at recycling, less and less plastic packaging should end up in EfW in the residual waste stream.

Waste hierarchy



Mechanical recycling: Mechanical recycling involves grinding up recyclate and then melting it and reforming in to flakes or pellets for use in the manufacturing process. Some materials are relatively easy and cost effective to recycle this way, such as PET and HDPE.

Recycling export: bales of recyclate can be exported for reprocessing overseas. The level of auditing of exported material is relatively low and concerns exist around the quality of material[29].

In 2016, **30.3%** of plastic packaging was exported for recycling, and just below **15%** was recycled domestically[11].

Energy from waste-mass incineration: Energy from waste (EfW) via incineration is a robust method for regaining energy from waste material. As a general rule EfW plants do not wish to process plastics, as the higher calorific content means they are able to pass less through the plant at a time, and they are paid by weight that they process.

Energy from waste-gasification: Gasification plants also burn material, but in lower levels of oxygen, to produce a type of fuel called syngas. Gasification plants are not generally appropriate for handling highly heterogeneous waste and have a poor track record in the UK.

RDF export: Another form of export is as refuse derived fuels (RDF).

In 2013, **41%** of plastic packaging went to EfW, the majority was in the residual waste stream, **4.3%** came from the recycling stream[37].

Environment: Plastic can end up in the environment through littering, fly tipping/ dumping, or through mishandled exported material.

Landfill: Although the amount of waste going to landfill has reduced significantly since the introduction of the landfill tax, this is still an end destination for much plastic waste in residual waste streams.

In 2013, **24.4%** of plastic packaging went to landfill. This was all in the residual waste stream[37].

Chemical recycling (not currently at commercial scale): Chemical recycling involves heating plastic material in the absence of oxygen to break it down to its constituent monomers. These monomers can then be built back up in to longer hydrocarbon chains for use either as fuel or plastic feed stock. There are currently no full scale commercial chemical recycling plants in the UK, however smaller scale plants exist and commercial scale plants are planned for the near future. Chemical recycling is likely to play a complimentary role to mechanical recycling, as it can handle types of plastics that are not suitable for mechanical recycling.

What can we do?

Data improvements: To give a clearer picture of the recycling rate, data should be collected based on the quantity reprocessed rather than the amount passed to the reprocessor/exporter. The Environment Agency Plastics Packaging Taskforce should lead on improvements to data collection and oversight. Such a change forms a part of the European Union Circular Economy Package[36], and we urge the government to fully integrate this into the UK's approach.

Net zero export goal: To protect ourselves from market shocks and retain the most value from our resources the UK should commit to net zero exports of plastic packaging recyclate by 2030 at the latest. Dealing with our own waste will show leadership and should drive greater innovation – which itself can then be exported to deal with problems globally.

Hitting this ambitious target will require harnessing our world-leading recycling tech expertise along with greatly increased investment. Strategic leadership will be important to grow the necessary infrastructure for cutting dependence on international markets. The government should ask the National Infrastructure Commission urgently to map out the infrastructure requirements for reaching net zero exports by 2030. The Commission should also consider the need for 'infrastructure of last resort' to ensure we do not end up needlessly landfilling or exporting material if recycling targets are not met.

Kick starting the recycled content market: Using recycled content is already becoming a marketing strategy for companies wishing to increase their green credentials. The recently announced tax on packaging containing below 30% recycled content will help to drive this trend. The proposed rate for this tax, 30%, may be too low for some formats and too high for others. We suggest different recycled contents targets for different formats and applications. The targets should be set high enough to stimulate investment in reprocessing, but should reflect the difficulties of sourcing recycled material for some formats; specifically, for plastics used to wrap food. The required level of recycled content should be gradually increased as more high quality recycled plastic material becomes available.

Recommendation 15: A target of net zero export of plastic packaging collected for recycling should be set for 2030 at the latest.

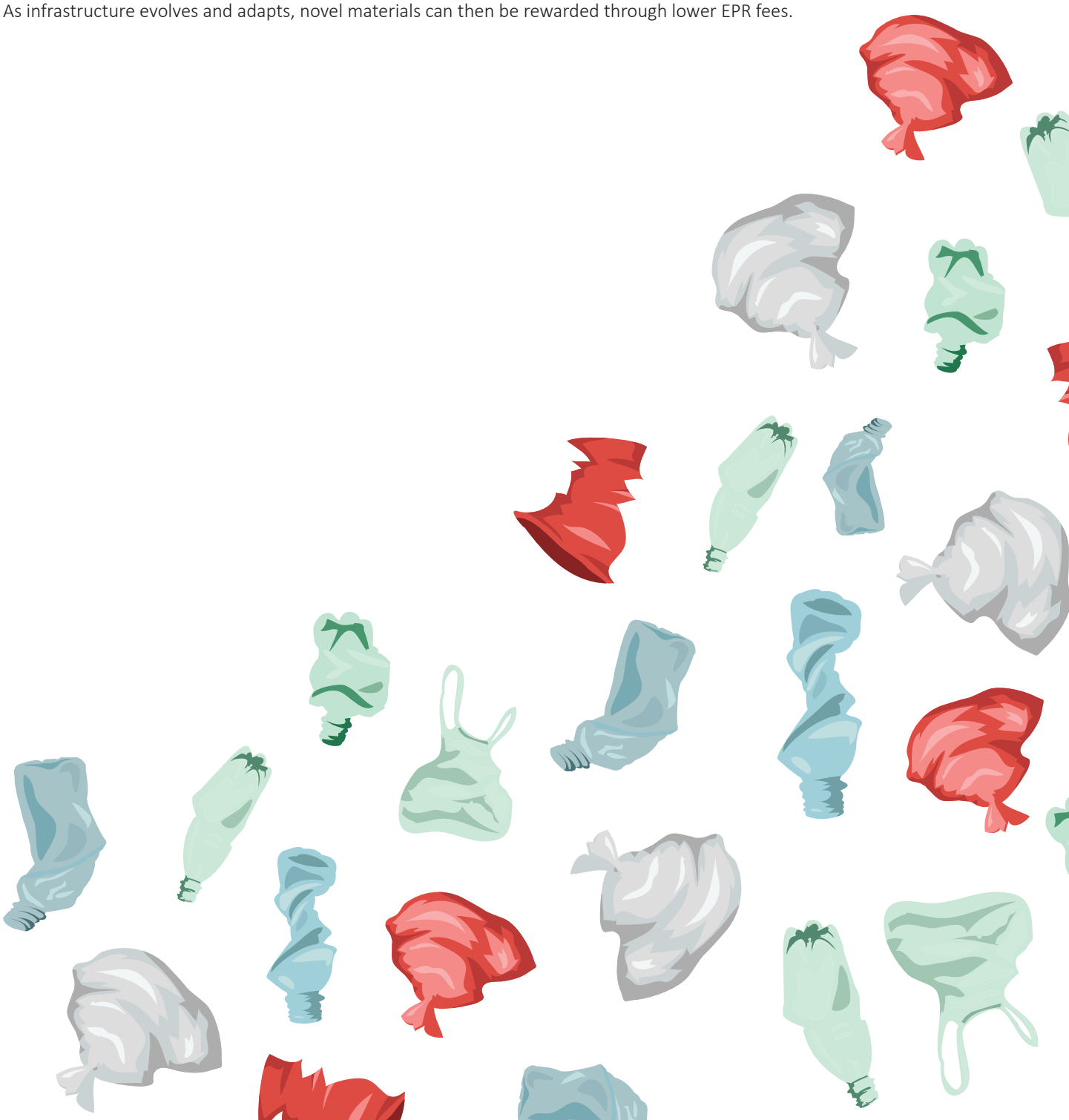
Recommendation 16: The government should invite the National Infrastructure Commission urgently to assess the future infrastructure needs to deal with our own packaging waste in the UK in the most environmentally sound way possible.

Recommendation 17: The point at which material is allowed to be classified as recycled should be changed to after reprocessing, including for any exported material.

Recommendation 18: The Treasury should set the percentage of recycled content target for their proposed tax at different levels for different packaging formats, depending on the availability of recycled material. The Treasury should devise a protocol for periodically revising these target percentages upwards as recycling improves.

A note on material innovation

There was disagreement between our participants as to whether material innovation should be prioritised, or if rationalisation of plastic types is the more sensible approach. We suggest that a compromise can be met that allows for positive innovation in a way that accounts for how these materials fit into the whole value chain. The approved list (and associated EPR fees) introduced as we propose above, negotiated periodically with cross-supply chain representatives, will ensure that high fees are charged for any material that currently does not have a good end of life solution. As infrastructure evolves and adapts, novel materials can then be rewarded through lower EPR fees.



Conclusion

Plastics are a global problem, and the UK needs to do its part by getting its own house in order and dealing responsibly with the plastic waste we produce. Our current situation is caused by multiple factors that result in people not valuing plastic as the wonderful resource that it is. As a result, the problem is not susceptible to a 'silver bullet' and people should be wary of being enticed by apparent panaceas. The recommendations in this report are therefore multi-faceted and form a holistic strategy for action across the whole value chain. We currently have a window of opportunity to get things right with plastic packaging. Once the new system is designed, there should be a clear commitment to maintaining a consistent pathway for a number of decades. A major barrier to improved waste management is constant shifting of the regulatory framework.

Cross-party support for the renewed approach is therefore essential to set a clear, fixed goal in law, as was successfully done with the Climate Change Act. We believe the strategy outlined here will contribute to ensuring the new system is well designed and will stand the test of time.

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Contributions

Evidence Session One

Zero Plastic Waste: Consumer choice and decision making.
30/10/2018

Chair: Lord Teverson

Parliamentarians: Anna Main MP and Vicky Ford MP

Attendees
Asda
Defra
ESRC
Innovate UK
Local Authority Recycling Advisory Centre
Marine Conservation Society
On-Pack Recycling Label
Southern Water
Suez
The Source Bulk Foods
University of Cardiff
Valpak
Waste and Resources Action Programme

Evidence Session Two

Zero Plastic Waste: Fixing the supply chain.
31/10/2018

Chair: Anna McMorrin MP

Attendees
Department for Business, Energy and Industrial Strategy (BEIS)
British Plastics Federation
CIWM
ClientEarth
Defra
Industry Council for Packaging and the Environment
Innovate UK
Local Government Association
Nestle
Packaging Scheme Forum
Sainsbury's
University of Northampton
Valpak
Veolia
Waste and Resources Action Programme

Interviews

BASF
BEIS
Biffa
Bio-based and Biodegradable Industries Association
Cory Energy
Ecosurety
Ella's Kitchen
Environment Agency
Environmental Services Association
Food and Drink Federation
Industry Council for Packaging and the Environment
Innovate UK (part of UKRI)
Local Authority Recycling Advisory Centre
Local Government Association
London Waste and Recycling Board
Lucozade Ribena Suntory Limited
Marine Conservation Society
Mike Walters, Waste Management Consultant
Natural Environment Research Council
(part of UKRI)
Nestle
On-Pack Recycling Label
Packaging Scheme Forum
Plastic Energy
Sainsbury's
Southern Water
Suez
The Packaging Federation
The Source Bulk Foods
University of Cardiff
University of Northampton
Valpak
Veolia
Waste and Resources Action Programme

Acknowledgements

This report and the contained recommendations are the work of Policy Connect. Funding to support the work and expertise to inform our findings were provided by the Natural Environmental Research Council and Innovate UK with additional expertise provided from across UK Research and Innovation. UK Research and Innovation is a new body which works in partnership with universities, research organisations, businesses, charities, and government to create the best possible environment for research and innovation to flourish. It brings together the UK's Research Councils, including Innovate UK and the Natural Environment Research Council, into a single organisation that aims to ensure the UK maintains its world-leading position in research and innovation.

We also wish to thank all organisations that were consulted over the course of this project for their time and invaluable insights.

As stated above, many of the recommendations made here are not new, and this report owes much to pre-existing work in this area. All consulted documents can be found in the Appendix 1 and many are directly referenced throughout the report.

About Policy Connect

Policy Connect is a cross-party think tank improving people's lives by influencing public policy. We collaborate with Government and Parliament, through our APPGs, and across the public, private and third sectors to develop our policy ideas. We work in health; education & skills; industry, technology & innovation, and sustainability policy.

Policy Connect is not-for-profit, cross-party, a London living wage employer and a Member of Social Enterprise UK.

This project was undertaken by the Sustainability policy team, part of Policy Connect.

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Antonia Sheedy, Senior Researcher, Sustainability

Jacob Ainscough, Research Fellow, Sustainability (Report Author)

Joanna Furtado, Researcher & Project Coordinator, Sustainability

In addition, special thanks go to Oona Muirhead CBE, Louise Young and Tom Howard-Vyse.

Appendix 1: Documents Reviewed

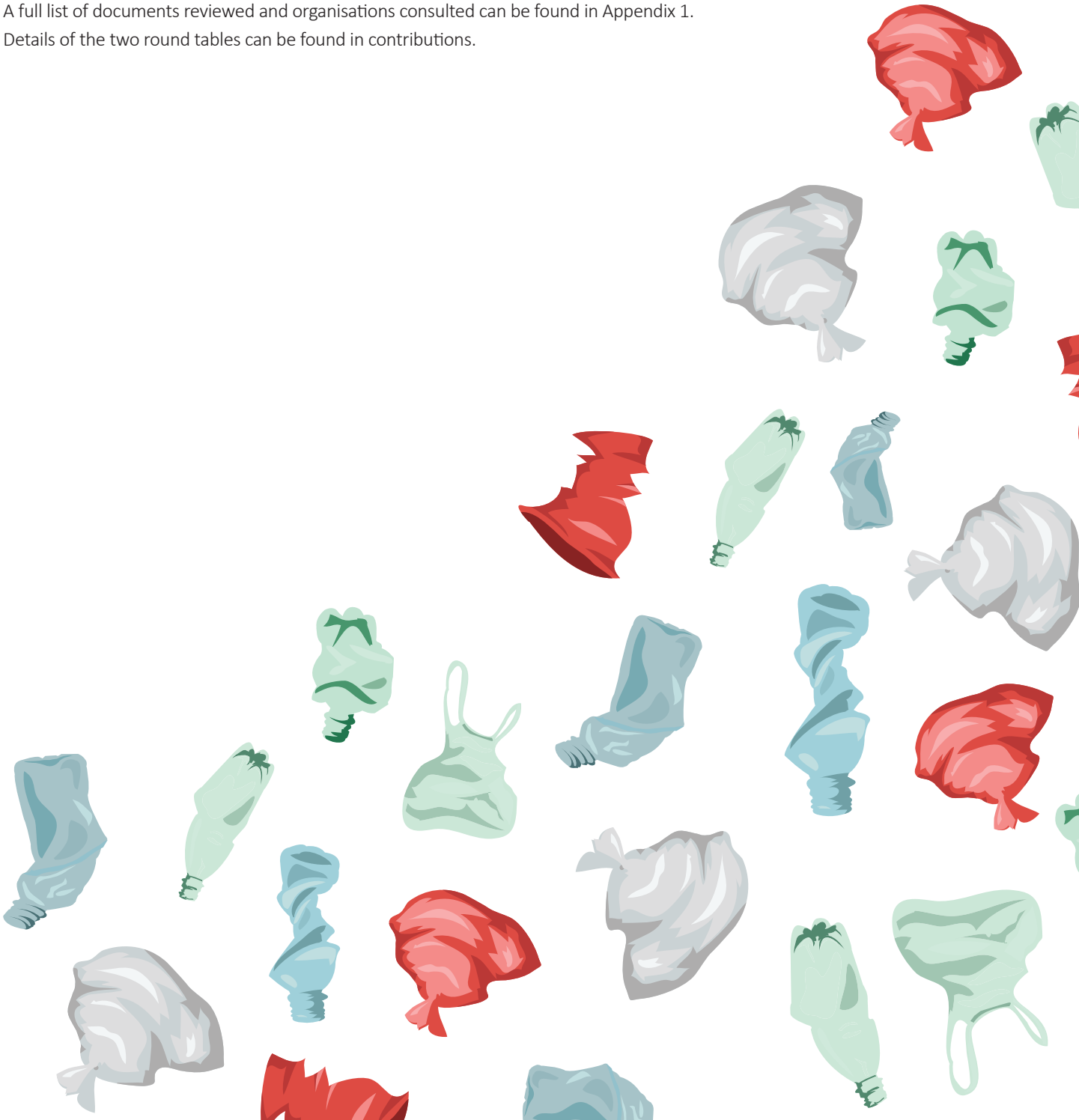
Organisation	Year	Title
Biffa	2018	Ten point plan
British Plastics Federation	2018	Plastic: A vision for a circular economy- improving the environment for the next generation
ClientEarth	2018	Risk unwrapped: Plastic pollution as a material business risk
Defra	2018	Consultation on proposals to ban the distribution and/or sale of plastic straws, plastics-stemmed cotton buds and plastic drink stirrers in England
Department for Environment, Food and Rural Affairs	2018	Digest of waste and resources statistics - 2018 edition
Environmental Services Association	2018	Delivering best value through competition
Environmental Services Association	2018	Energy for the circular economy: An overview of energy from waste in the UK
Eunomia	2018	A plastic future: Plastic consumption and waste management in the UK
Eunomia	2018	Demand recycled: Policy options for increasing the demand for post-consumer recycled material
Eunomia	2018	Plastic packaging: Shedding light on the UK data
Green Alliance	2018	Completing the circle: Creating effective UK markets for recovered resources
Grundon	2018	Wastelines: Summer 2018 edition
HM Government	2018	A green future: Our 25 year plan to improve the environment
HM Government	2018	Our waste, our resources: A strategy for England
HM Treasury	2018	Tackling the plastic problem: Using the tax system or charges to address single-use plastic waste
HM Treasury	2018	Tackling the plastic problem: Summary of responses to the call for evidence
House of Commons Library	2018	Briefing paper: Household recycling in the UK
Industry Council for Packaging and the Environment	2018	Factsheet: (Using) less packaging
Industry Council for Packaging and the Environment	2018	Factsheet: Too much packaging?
Industry Council for Packaging and the Environment	2018	Factsheet: Lifecycle thinking - the benefits
Industry Council for Packaging and the Environment	2018	Factsheet: Carbon footprinting and lifecycle assessment
Institute for European Environmental Policy	2018	EPR in the EU plastics strategy and circular economy: A focus on plastic packaging
Institute for European Environmental Policy	2018	Unwrapped: How throwaway plastics in failing to solve Europe's food waste problem
Keep Britain Tidy	2018	Litter in England: The local environmental quality survey of England 2017/18
National Audit Office	2018	The packaging recycling obligations
National Infrastructure Commission	2018	National infrastructure assessment
National Non-Food Crops Centre	2018	Market perspective: Bio-based and biodegradable plastic in the UK
Resources Futures and Nextek	2018	Eliminating avoidable plastic waste by 2042: A use-based approach to decision and policy making
University of Cambridge	2018	Towards sustainable packaging: A plan to eliminate plastic packaging waste from UK bottle waste and soft drinks
Vegware	2018	Compostables and the waste & resources strategy
Voluntary and Economics Incentives Working Group	2018	Voluntary and economic incentives to reduce littering of drinks containers and promote recycling
DerGrunePunkt	2017	EPR for packaging in Germany - Der Grune Punkt
Eunomia	2017	Residual waste infrastructure review: Issue 12
Eunomia and Institute for European Environmental Policy	2017	Landfill tax in the United Kingdom
Green Alliance	2017	Infographic: What happens to plastic in the sea?
Green Alliance	2017	Infographic: How to stop nearly two thirds of plastic waste getting into the sea
Green Alliance	2017	Recycling reset: How England can stop subsidising waste
HM Government	2017	Litter strategy for England
PlasticsEurope	2017	Plastics - the facts 2017: An analysis of European plastics production, demand and waste data
RECycling Of Used Plastics Ltd	2017	Local authority disposal 'on the go' survey
RECycling Of Used Plastics Ltd	2017	Plastic packaging recyclability by design
RECycling Of Used Plastics Ltd	2017	UK household plastic collection survey
Valpak	2017	Packflow 2025: Full report
Clean Up Britain	2016	Using behavioural insights to reduce littering in the UK
Ellen MacArthur Foundation	2016	The new plastics economy: Rethinking the future of plastics and catalysing action
Marine Conservation Society	2016	Great British beach clean 2016 report
Waste and Resources Action Programme	2016	Supporting evidence and analysis: The case for greater consistency in household recycling
Waste and Resources Action Programme	2016	A framework for greater consistency in household recycling in England
Waste and Resources Action Programme and Valpak	2016	Plastic spatial flow: An assessment of the quantity of un-recycled plastic in the UK
Marine Conservation Society	2015	Marine plastics pollution policy and position statement
University of Bath	2015	Customer attitudes towards the environmental components of packaging at M&S
International Solid Waste Association	2014	Global recycling markets: plastic waste
UKWIN	2013	Renewable energy subsidies in the UK: The case for excluding bioenergy and waste incineration
Waste and Resources Action Programme	2009	An introduction to packaging and recyclability
Salterbaxter	2008	Are we suffocating under the weight of the packaging problem?
Waste and Resources Action Programme	2006	Potential refill solutions for the food and non-food retail sectors - feasibility study

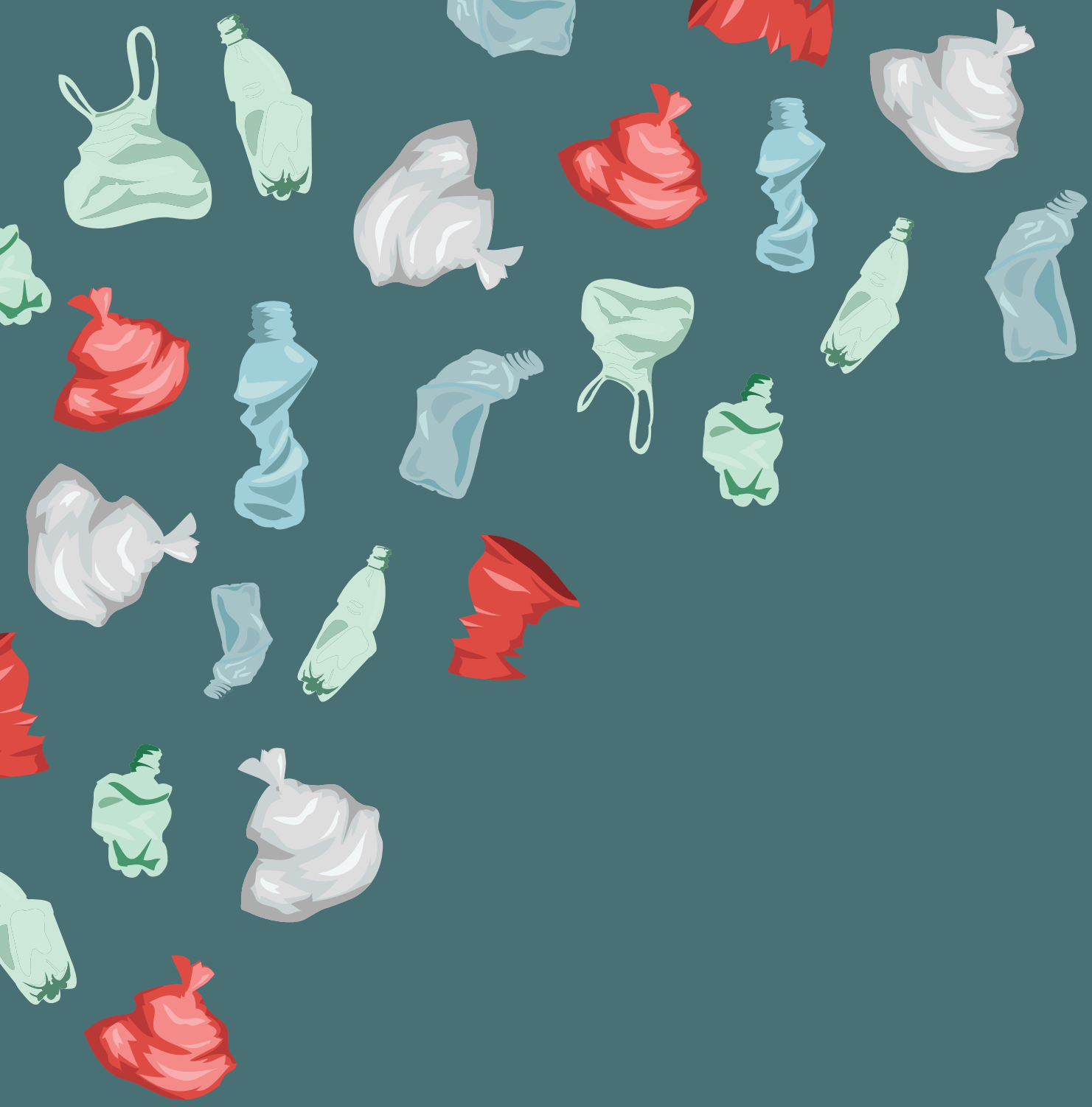
Appendix 2: Data Collection

This project drew upon a wealth of research and reports from a large number of organisations, as well as primary data collected through one-to-one interviews and round tables discussions with experts from industry, academia, government, and NGOs.

A total of 32 Interviews were undertaken between September and November 2018. Two parliamentary round tables were held in October 2018 to discuss issues in more detail. The first focused on consumer behaviour issues and the second on the supply chain.

A full list of documents reviewed and organisations consulted can be found in Appendix 1. Details of the two round tables can be found in contributions.





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