

# Pearson BTEC Level 3 Nationals Extended Diploma

## Supervised Window

7 December 2020 – 11 January 2021

Supervised period: 6 hours

Paper Reference **31629H**

## Applied Science

Unit 7: Contemporary Issues in Science

**Part A**

**You do not need any other materials.**

### Instructions

- **Part A** contains material for the completion of the preparatory work for the set task.
- **Part A** is given to learners during the supervised window before **Part B** is scheduled. Learners are advised to spend no more than 6 hours on **Part A**.
- **Part A** must be given to learners on the specified date so that learners can prepare in the way specified.
- **Part A** is specific to each series and this material must only be issued to learners who have been entered to undertake the task in the relevant series.
- **Part B** materials must be issued to learners on the date specified by Pearson.

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## Instructions to Teachers/Tutors

This paper must be read in conjunction with the unit information in the specification and the BTEC Nationals *Instructions for Conducting External Assessments (ICEA)* document. See the Pearson website for details.

This set task has a preparatory period. **Part A** sets out how learners should prepare for the completion of the **Part B** task under supervised conditions.

**Part A** is given to learners during the specified window before **Part B** is scheduled. Learners are advised to spend no more than six hours on **Part A**.

Learners should undertake independent research on the case study given in this **Part A** booklet.

Centres must issue this booklet at the appropriate time and advise learners of the timetabled sessions during which they can prepare. It is expected that scheduled lessons or other timetabled slots will be used for the preparation.

Learners should familiarise themselves with the specific concepts and terminology used in the articles.

Learners may prepare summary notes on the articles. Learners may take up to four sides of A4, which may be handwritten or word processed, into the supervised assessment (**Part B** task and answer booklet).

These notes should only include information about scientific terminology, quantities and concepts used in the articles and a summary of the scientific issue discussed. This will enable learners to interpret, analyse and evaluate the articles in **Part B**. Other content is not permitted.

**Part B** must be completed under supervision in a single session of 2 hours and 30 minutes timetabled by Pearson. A supervised rest break is permitted.

The supervised assessment should be completed in the **Part B** task and answer booklet.

Teachers/tutors should note that:

- learners should not be given any direct guidance or prepared materials
- learners should not be given any support in writing or editing notes
- all work must be completed independently by the learner
- learner notes will be retained securely by the centre after **Part B** and may be requested by Pearson if there is suspected malpractice.

Refer carefully to the instructions in this taskbook and the BTEC Nationals *Instructions for Conducting External Assessments (ICEA)* document to ensure that the preparatory period is conducted correctly and that learners have the opportunity to carry out the required activities independently.

## Instructions for Learners

Read the set task information carefully.

This is **Part A** of the set task and gives information you need to use to prepare for **Part B** of the set task.

In **Part B** you will be asked to carry out specific activities using the information in this **Part A** booklet and your preparatory notes.

In your preparation for **Part B**, using this **Part A** booklet, you may prepare short notes to refer to when completing the set task. Your notes may be up to four sides of A4 and may be handwritten or word processed. Your notes should only include information about scientific terminology, quantities and concepts used in the articles and a summary of the scientific issue discussed. This will enable you to interpret, analyse and evaluate the articles in **Part B**. Other content is not permitted.

You will complete **Part B** under supervised conditions.

You must work independently throughout the supervised assessment and must not share your work with other learners.

Your teacher/tutor may give guidance on when you can complete the preparation.

Your teacher/tutor cannot give you feedback during the preparation period.

You must not take your preparatory notes out of the classroom at any time and you must hand them in to your teacher/tutor on completion.

Your notes will be made available to you at the beginning of the supervised assessment.

### Set Task Brief

You are provided with the following articles:

Article 1: Plastic alternatives may worsen marine pollution, MPs warn

<https://www.theguardian.com/environment/2019/sep/12/plastic-alternatives-may-worsen-marine-pollution-mps-warn>

Article 2: Five ways to end plastic waste

<https://medium.com/circulatenews/five-ways-to-end-plastic-waste-69ee2dec0f81>

Article 3: Checking out on Plastics II: Breakthroughs and backtracking from supermarkets

<https://eia-international.org/wp-content/uploads/Checking-Out-on-Plastics-2-report.pdf>

Your notes should only include information about scientific terminology, quantities and concepts used in the articles and a summary of the scientific issue discussed.

You should spend up to a maximum of six hours to complete your preparatory notes. You may take up to four sides of A4 notes into the supervised assessment.

## Part A Set Task Information

### Article 1

#### Plastic alternatives may worsen marine pollution, MPs warn

#### Committee says UK should reduce use of plastics rather than replace it with other materials.

*This is an edited version of an article that appeared in 'The Guardian' newspaper in September 2019. The article was written by Sandra Laville.*



*Plastic rubbish floating in the ocean. MPs were told that a biodegradable cup could pose as much of a problem to marine life as a conventional plastic cup.*

(Source: © Paulo Oliveira / Alamy Stock Photo)

Compostable and biodegradable plastics could add to marine pollution because there is no infrastructure in place to make sure they break down correctly, a committee of MPs has warned.

The use of alternatives to plastic are being adopted by many food and drink companies, takeaway coffee venues, cafes and retailers. But experts giving evidence to MPs on the Environment, Food and Rural Affairs committee said the infrastructure required to deal with the new packaging was not in place and there was a lack of consumer understanding about these alternatives.

Much of the compostable packaging produced for the UK market only degrades in industrial composting facilities, rather than in home composting – but not all is sent to these facilities.

Environmental non-governmental organisations (NGOs) told the committee that the rapid introduction of such alternatives could actually increase plastic pollution.

Juliet Phillips, of the Environmental Investigation Agency (EIA), said: "If a biodegradable cup gets into the sea, it could pose just as much of a problem to marine life as a conventional plastic cup."

The environmental think tank Green Alliance said there was evidence that the term biodegradable made consumers think it was fine to discard it into the environment, which would make pollution on land and at sea even worse.

Neil Parish, chair of the Commons select committee, said: "In the backlash against plastic, other materials are being increasingly used as substitutes in food and drink packaging. We are concerned that such actions are taken without proper consideration of wider environmental consequences, such as higher carbon emissions. Compostable plastics have been introduced without the right infrastructure or consumer understanding to manage compostable waste."

Keep Britain Tidy said "the drive to introduce bioplastics, biodegradable plastics and compostable plastics is being done with limited emphasis on explaining the purpose of these materials to the public or consideration of whether they are in fact better from an environmental perspective than the plastic packaging they replace."

The committee, in a report on plastic food and drink packaging published on Thursday, said the government should focus on reducing the use of plastic packaging rather than replacing it with other materials. "Reduction is far more important than recycling, and a fundamental shift away from all single-use packaging, plastic or otherwise, is now necessary," the report said.

A government consultation on biodegradable and compostable packaging is under way. It will examine whether the standard required for all such alternative plastics should be that they can be home composted.

In evidence to the committee Libby Peake, from Green Alliance, said there was a need for standards to be re-examined, saying: "Some companies are already switching to alternatives including bio-based and compostable plastics, paper, cartons or other materials in ways that will not ultimately prove sustainable."

Peake added: "You cannot have a wholesale switchover to bio-based plastics, to aluminium, to glass or to paper, which all have environmental consequences themselves."

Vegware, a compostable packaging manufacturer, said it advised consumers to put their products in the general waste if suitable composting was not possible.

The committee said it was shocking that the government had no idea how much plastic packaging was put on to the market. This is because the system is based on producers self-declaring their packaging footprint, and only those with a turnover of more than £2m and 50 tonnes of packaging a year are obliged to release their data. MPs recommended this figure should be reduced to 1 tonne.

Phillips from the EIA welcomed the report. She said: "To date, far too little government attention has been given to addressing the root causes of the pollution crisis by challenging our unsustainable single-use society. EIA urges the government to take note of its findings, introducing a long-term strategy to catalyse a wholesale transition away from wasteful, unnecessary single-use packaging and towards reusable and refillable solutions."

Disposable, single-use plastics used for packaging food and drink – particularly cigarette butts, plastic drinking bottles, plastic caps, food wrappers, grocery bags, plastic lids, straws and stirrers – are the most common single use plastics found in the environment, according to a 2018 United Nations report.

## Article 2

### Five ways to end plastic waste

#### **From packaging made out of organic waste to nano-engineering, the winners of the \$2 million New Plastics Economy Innovation Prize provide real answers to the plastic problem**

*This is an edited version of an article published by 'Circulate News' on the Medium website in January 2018. The article was written by Joe Iles.*

There's no love lost for plastic packaging. Whether it's complicated recycling instructions on the products we buy, startling images of the impacts on wildlife, or simply the economic value lost through waste, plastics have been climbing the international agenda for years. So how do 8 million tonnes of plastic still end up in the ocean each year?

#### **Searching for the right solutions**

The urgency of the issue has led to brands, governments, NGOs and celebrities promoting a host of solutions. Reusable packaging is part of the answer, and shopping bags, water bottles and coffee cups have become popular purchases for those trying to do their bit. This works to replace certain types of packaging, but think about all the other different pieces of plastic we come into contact with every single day. Plastic film can keep food fresher for longer, and wrappers ensure medical equipment is safe for patients. In many cases, it wouldn't be hygienic, convenient or feasible to go fully reusable.

There are also a number of initiatives that aim to tackle the impacts of the problem, from scooping plastics out of the ocean to collecting litter from beaches. Again, these are valuable efforts and must continue. However, the three best known major international ocean clean-ups combined deal with less than 0.5% of those 8 million tonnes of plastics that enter the ocean annually. We need to treat the cause, as well as the symptoms. This means looking upstream to design a plastics system that works, in which this material never ends up as waste in the first place.

The challenge here is that when it's used, plastic packaging becomes dispersed. These items are distributed throughout the world in endless configurations and uses, with billions of different customers. They're often tiny, lightweight, difficult to collect and individually aren't worth that much. So to truly rethink the way we make and use plastics, we need to come up with new approaches and systemic solutions.

#### **Designing a better system**

That's the thinking behind the New Plastics Economy Innovation Prize, launched in 2017 by the Ellen MacArthur Foundation, together with the Prince of Wales' International Sustainability Unit, and funded by Wendy Schmidt. The competition invited designers and materials scientists to reinvent the types of plastic packaging that are almost never collected and recycled, and end up in landfill, incinerators or in the environment.

The winners are awarded a share of the \$2 million prize, as well as a 12-month accelerator programme, in collaboration with Think Beyond Plastic.



The Innovation Prize is comprised of two parts. At the Our Ocean conference in October, the organisers announced the first batch of winning submissions. For this Circular Design Challenge, teams were tasked with coming up with superior alternatives to items like shampoo sachets, wrappers, straws and coffee cup lids. These 'small-format packaging items' account for 10% of all plastic packaging, and are currently not recycled and often end up in the environment.

### **Inventing circular materials**

The second group of winners is being announced at this year's Annual Meeting of the World Economic Forum in Davos. The Circular Materials Challenge seeks ways to make all plastic packaging recyclable. This means inventing better solutions than conventional packaging, and the features that we take for granted. For example, many plastic films aren't just made of one type of polymer, but a range of different materials all mixed up. Each material has a function – water resistance, airtightness, appearance – but they also make common packaging items unrecyclable.

The Circular Materials Challenge invites innovators to find alternative materials that could be recycled or composted. The five winning entries show what's possible when the principles of a circular economy are used to guide the research and development process. The intention is that these innovations not only inspire further progress, but are adopted, scaled and integrated into a working plastics industry.

### **Packaging inspired by nature**

The University of Pittsburgh team applies nano-engineering to create a recyclable material that can replace complex multi-layered packaging that is unrecyclable. This mimics the way nature uses just a few molecular building blocks to create a huge variety of materials.

### **Recyclable packaging, with help from magnets**

Aronax Technologies Spain proposes a magnetic additive that can be applied to a material, creating better air and moisture insulation – making it suitable to protect sensitive products such as coffee and medical products, while still being possible to recycle.

### **Packaging from food waste**

Working together, Full Cycle Bioplastics, Elk Packaging, and Associated Labels and Packaging make a compostable high-performance material from renewable materials, agricultural by-products and food waste to pack a broad range of products from granola bars and crisps to laundry detergent.

### **'Plastic' made from wood**

The VTT Technical Research Centre of Finland has created a compostable multi-layer material from agricultural and forestry by-products, which could be used for stand-up food pouches for products like muesli, nuts, dried fruit and rice.

### **Compostable coatings**

The Fraunhofer Institute for Silicate Research ISC has developed a coating with silicate and biopolymers that can be used in many different food packaging applications, protecting biopolymer packaging and food against premature degradation and is fully compostable.

## **The circular economy transition**

“These winning innovations show what’s possible when the principles of a circular economy are embraced”, said Ellen MacArthur, responding to the announcement of the winning entries. She continued: “Clean-ups continue to play an important role in dealing with the consequences of the waste plastic crisis, but we know we must do more. We urgently need solutions that address the root causes of the problem”.

In 2016, the Ellen MacArthur Foundation released the first New Plastics Economy report, which provided the alarming and widely shared statistic that if we don’t change how we make and use plastic, by 2050 the oceans could contain more plastics than fish, by weight. Viewers of the BBC series Blue Planet 2 saw this concern brought to life last year, resulting in another spike in public attention.

The New Plastics Economy reports have called for a redesign of the plastics system in line with the principles of a circular economy, a shift that will require a change in mindset.

Because try as we might, as a society we haven’t made much progress on the ‘plastics problem’. The recycling symbol has been around for over 40 years, but just 14% of plastic packaging is actually collected, and of that only 2% is properly recycled. The rest is lost during the recycling process, or goes to lower value goods. Despite best intentions, that yoghurt pot you recycled probably won’t be reborn as another yoghurt pot.

So the new goal, according to the Ellen MacArthur Foundation, is “a New Plastics Economy, in which plastics will never become waste or enter the ocean in the first place.”

## **Creating system level change**

While the winning innovations represent the type of solutions needed to build a plastics system that works, these teams cannot drive the transition alone.

That’s why the Innovation Prize is part of the New Plastics Economy Initiative, an ambitious collaboration led by the Ellen MacArthur Foundation, with participation from a broad group of leading companies, cities, philanthropists, policymakers, academics, students, NGOs, and citizens.

Following an announcement in Davos, there are now 11 leading brands, retailers, and packaging companies working towards using 100% reusable, recyclable or compostable packaging by 2025 or earlier.

Together, these bold commitments, along with the right policy incentives and demonstrators of radical innovation, provide us with the best chance of creating a plastics system that works.

Emblematic of the ‘take, make, dispose’ world we live in; if we can make plastic packaging fit within a circular economy, there’s reason to believe that other industries can follow suit.



## Article 3

### Checking out on Plastics II: Breakthroughs and backtracking from supermarkets

*This is an edited version of a report published by the Environmental Investigation Agency and Greenpeace on 28 November 2019.*

#### 1. Executive Summary

Our throwaway convenience culture costs the earth. Resources are being extracted, manufactured and transported to be used just once. Ever-growing mountains of mixed plastic waste are impossible to recycle and are usually dumped in landfill sites, incinerated or leaked into the natural environment. There has been an unprecedented level of public and political focus on the plastic pollution crisis in recent years. Despite this, the second survey conducted by the Environmental Investigation Agency (EIA) and Greenpeace UK reveals that little tangible progress has been made in the past year by the UK's largest supermarkets towards reducing their use of throwaway plastics.

It is time for supermarkets to accelerate commitments and scale up actions, moving from small-scale trials to support a truly circular and zero-waste economy. Supermarkets have a vital role to play as a catalyst for change, given their pivotal location in the grocery value chain between customers and suppliers. This report is a wake-up call for faster action, providing a series of recommendations and best practice case studies.

#### 2. Background

Our planet faces a biodiversity and climate emergency. Without a significant turnaround in resource consumption and a shift towards circular and zero-waste economies, these problems cannot be addressed. Plastic pollution is the ugly and unacceptable face of a crisis that goes deeper. It has raised unprecedented public awareness of the scale and impact of over-consumption and our throwaway culture.

The grocery retail sector is currently highly dependent on packaging designed to be used just once and thrown away; adding fuel to the pollution and waste crisis that is evident around the world. Of the five million tonnes of plastic used in the UK every year, half is plastic packaging.<sup>2</sup>

Supermarkets are well-positioned to catalyse a fundamental shift in the systems that deliver products to people, through significantly reducing all but the most essential single-use packaging and supporting a wholesale shift into packaging-free and reusable solutions.

To date, most government and industry attention has focused on recycling, which has an important role to play but cannot solve the problem alone. In order to close the gap between rising plastic consumption and limited recycling capacity, a focus on reduction is required. Without a significant turnaround in industry trends, UK plastic packaging waste will increase by 22% between 2018 and 2030.<sup>3</sup> Currently, only about a third of UK consumer plastic packaging is officially reported as 'recycled' and about half of this is exported. This calls into question the amount ultimately recycled, given the lack of waste management infrastructure in many recipient countries, including those in South-East Asia where there are high levels of plastic pollution leakage into the marine environment.<sup>4</sup>

Plastic production and consumption affects human health; we are exposed to a large variety of toxic chemicals and harmful pollutants throughout the plastic lifecycle.<sup>5</sup> Plastic poses significant threats to marine, freshwater and terrestrial fauna; it harms soil ecosystems and emits toxic chemicals when burnt. Simply substituting single-use plastic with other single-use materials is no solution either.<sup>6</sup> All materials have environmental and social costs, including resource consumption concerns associated with pulp, paper<sup>7,8</sup> and glass;<sup>9</sup> and pollution and health risks regarding bauxite ore mining for aluminium production.<sup>10</sup>

Addressing the plastic problem requires a fundamental rethink of modern consumerism, not just fast-fix solutions. It requires us to challenge branding and marketing practices that encourage us to buy more than we need. It requires a shift to seasonal and local diets, shortening supply chains that otherwise result in huge amounts of air miles and packaging. It requires us to challenge the prevailing convenience culture and overconsumption that drive so many of the world's environmental challenges. Grocery retailers are in a prime position to help inspire the transformational changes we need.

### **3. Methodology**

In May 2019, EIA and Greenpeace UK sent a survey to 16 UK grocery retailers to gain insight into how the sector is working to tackle plastic pollution, and to track progress towards targets and policies reported in our 2018 Checking Out on Plastics survey.<sup>11</sup> The survey was sent to the UK's 10 largest supermarkets and online grocery giant Ocado, as well as five other grocery retailers with more than 1,000 stores in 2018, namely Bestway (2,000 stores), Booker Group (5,556 stores), Costcutter (1,776 stores), McColl's (1,242 stores) and SPAR UK (2,555 stores).<sup>12</sup> Themes covered were consistent with the 2018 survey, with additional questions to track progress towards commitments and targets.

Of the leading UK grocery retailers, the only non-respondent was Ocado, which also failed to respond to the 2018 survey. The response rate for convenience chain stores was poor again this year; only Costcutter and McColl's provided a full response to the survey while SPAR UK submitted a partial response. A large data gap therefore remains among the UK's leading convenience chains, including those owned by Booker Group (such as Premier, Londis and Budgens) and Best-One.

Most of the data collected in this year's survey covers the 2018 calendar year; however, some supermarkets provided data covering slightly different timeframes, namely Aldi (April 2018–19) and Morrisons (February 2018–19).

In order to analyse the data provided by supermarkets in the 2018 and 2019 surveys in relation to their market share, we used data from Nielsen Total Till and Nielsen Homescan. This depicts the value-based market share of each company during a 12-week period in 2017 and 2018, as well as the change in sales experienced by each company in the same timeframe.

We note that a direct linear relationship between market share and packaging volume is not necessarily expected, given that discounters sell a greater number of (packaged) units per pound sterling than other supermarkets.

The survey contained 20 questions aimed at understanding the performance of retailers according to the following categories:

1. Reduction in plastic footprint and use of reusables: Progress made since the last survey to reduce single-use items and packaging and expand packaging-free and reusable ranges, assessed where relevant against targets and milestones reported in the 2018 survey
2. Forward-looking commitments on reduction and reuse: Level of ambition regarding future-looking reduction and reuse commitments and targets
3. Recyclability and recycled content: Targets, commitments and progress made on removing non-recyclable plastics and increasing recycled content levels
4. Supply chain and stakeholder engagement: Engagement with suppliers (including branded suppliers, agricultural and fisheries suppliers and regarding pre-production plastic pellets), interactions with staff and customers about reducing plastic use, and public policy positions on government proposals such as Deposit Return Schemes
5. Transparency: Provision of full data regarding plastic items and packaging, as well as information on recyclability and recycled content and public policy positions.

### **Scoring methodology**

Supermarket responses were reviewed against objective criteria to determine a numerical score based on the ambition level of the response, with questions grouped into the five categories. A combined score was then determined for each category. Questions that were not relevant to a particular retailer were removed from their scoring criteria (e.g. if the retailer did not offer online shopping). The categories were weighted to place a greater emphasis on achieved reductions of single-use plastic and expansion of reusable and refillable ranges, as well as forward-looking commitments on these areas. This year, points were subtracted to penalise a lack of progress towards targets, as well as for absolute increases in plastic packaging and items over the past 12 months. Total scores were calculated for each retailer and ranked from highest to lowest to produce an overall league table. A third-party organisation, 3Keel, was consulted in the development of the scorecard (see Table 1).

Convenience chains were not included in the league table, given the limited data and different circumstances faced by these companies (e.g. lack of direct control over franchise stores).

### **4. Results of supermarket ranking**

The 2019 ranking reflects progress made over the past year to deliver tangible reductions in single-use plastic and move towards packaging-free and reuse solutions. As with last year, the scoring is very close between companies, with few achieving high marks under any of the categories. Even among leading companies there are areas where significant progress is needed.

This year's leader, Waitrose, was one of the few companies that reduced its overall plastic footprint and is making progress in scaling-up packaging-free and refill solutions. Morrisons has also shown initiative in this area; we applaud its introduction of the first quantified target to increase sales through reuse and refill ranges.

Looking at last year's survey ranking, we see good progress made by Sainsbury's in introducing ambitious plastic reduction targets and committing to scale-up reuse ranges. Iceland has slipped from first place as other companies increase the ambition of commitments on reduction and reuse. In order for the company to reclaim the lead, further progress will be needed on scaling-up packaging-free and reuse solutions, in addition to engaging with branded suppliers about reducing their plastic footprints.

Companies at the bottom of the league table had increased their overall plastic footprint since last year and had generally made the least progress to date on trialling and expanding packaging-free and reusable solutions. These companies had experienced sales growth and noted challenges in reducing their overall plastic footprint. With the right systems and approach in place it will be possible to increase sales while reducing throwaway packaging.

	Overall % score	Progress made on reduction and reuse	Future plans on reduction and reuse	Recyclability/ recycled content	Influencing suppliers	Transparency
Waitrose	52%	37%	52%	33%	64%	92%
Morrisons	51%	35%	44%	40%	64%	92%
Sainsbury's	44%	21%	56%	47%	60%	72%
M&S	43.7%	24%	26%	60%	55%	79%
Co-op	43.6%	18%	30%	50%	68%	82%
Tesco	43%	19%	52%	23%	80%	77%
Iceland	42.3%	26%	56%	20%	48%	74%
Lidl	41.6%	26%	30%	30%	52%	87%
Asda	39.1%	23%	33%	30%	56%	77%
Aldi	38%	13%	37%	37%	40%	87%

**Table 1 – Supermarkets' 2019 plastic policies revealed**

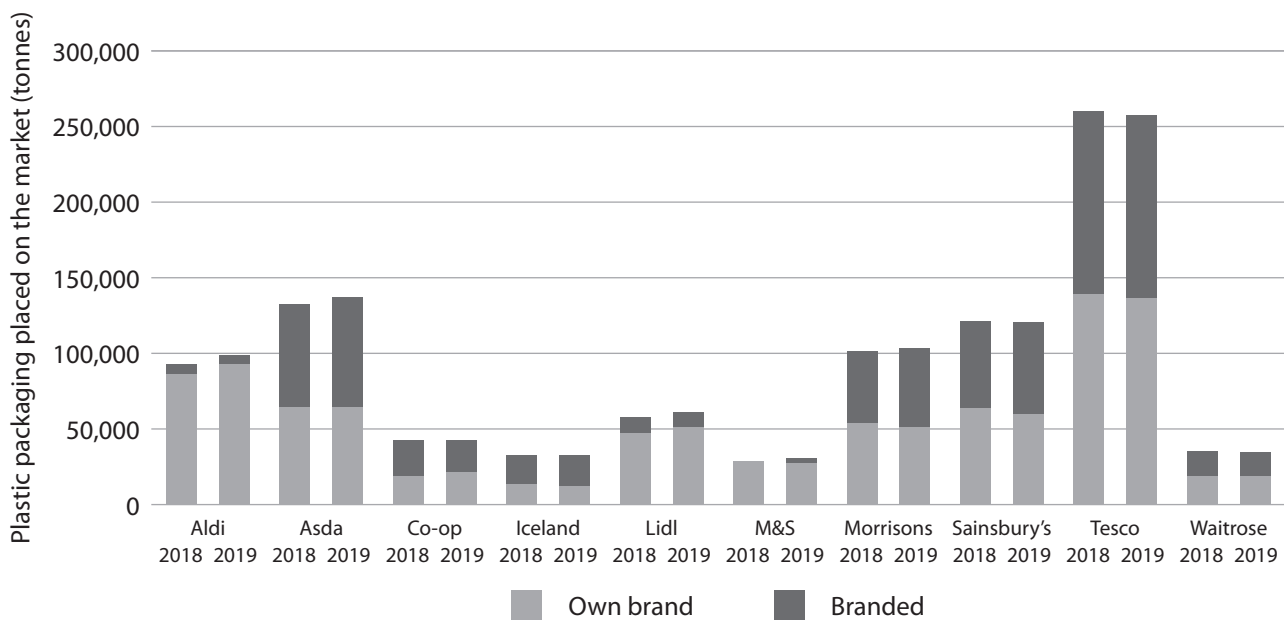
## 5. Summary of survey responses

### Amount of single-use plastic packaging put on the market

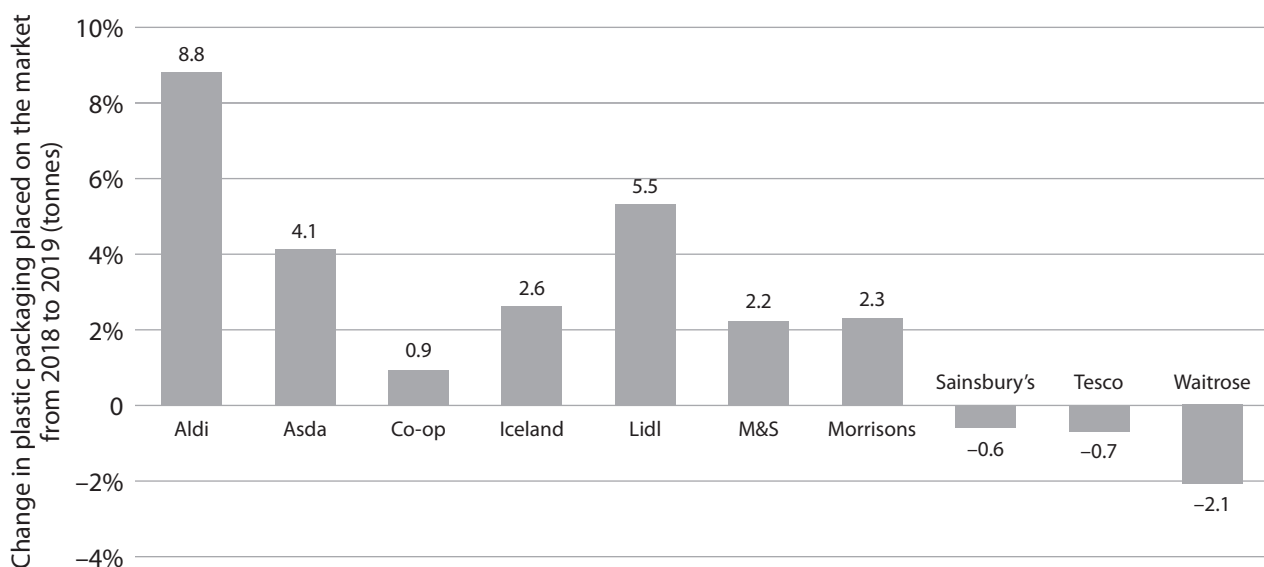
#### Absolute packaging footprint

Single-use plastic packaging used by the 10 UK supermarket giants increased from 886,000 tonnes in 2017 to 903,000 tonnes in 2018. Of this, 536,000 tonnes was from own-brand goods, a very slight decrease from last year's figure of 537,000 tonnes. Packaging from branded items amounted to 367,000 tonnes, a rise from last year's estimate of 349,000 tonnes.

Seven out of 10 supermarkets reported a higher plastic packaging tonnage in 2019 than in the previous survey (see Figures 1 and 2).



**Figure 1 – Plastic packaging tonnage (branded and own-branded) placed on the market reported in 2018 and 2019 surveys**



**Figure 2 – Change in total plastic packaging footprint (tonnes) reported in 2018 and 2019 surveys**

Only Waitrose, Tesco and Sainsbury's reported slight decreases in their overall plastic packaging footprint. The amount of packaging companies place on the market is proportionate to their market share, with year-on-year growth in packaging generally correlated to increases in sales. The companies reporting the largest absolute growth include Aldi (up by more than 8,000 tonnes, sales up 12.1%), Asda (5,300 tonnes, sales up 3.5%) and Lidl (3,000 tonnes, sales up 8.1%). Tesco occupies more than a quarter of the UK market (27.1%) and accounts for the largest amount of primary plastic packaging (259,000 tonnes). Sainsbury's, with a 14.5% market share, placed 119,000 tonnes of plastic packaging on the shelves, while Asda with a 13.7% market share distributed 135,000 tonnes.

### **Reduction targets – assessment of commitments and progress**

The top 10 UK supermarkets all now have targets to reduce their plastic packaging footprint. Among the most ambitious are Iceland (100% removal of single-use plastic packaging from own-brand by the end of 2023), Sainsbury's (50% plastic packaging reduction across branded and own-brand packaging ranges by 2025) and Tesco's commitment to reduce plastic packaging by 20% over two years across own-brand plastic packaging, removing one billion pieces of plastic by the end of 2020 (see Table 2).

An industry-wide trend is for the adoption of "relative" targets based on a past ratio of an amount of plastic and amount of sales. This does not guarantee an overall reduction in a company's plastic footprint. For example, if a company was putting one tonne of plastic on the market per £1,000 spent in 2015 and reduced this to 0.8 tonnes of plastic per £1,000 spent in 2020 – but had significantly increased in sales volume over this time, meaning that more £1,000s were being spent – then the total amount of plastic will have increased even though the company would have met its target. On the flip side, a decrease in packaging which is mainly attributable to a decrease in sales is no cause for celebration either.

Another limitation of many current plastic reduction targets is that they are limited to own-brand ranges. Branded goods typically make up 40–60% of a supermarket's sales (with the exception of Lidl, M&S and Aldi which are significantly lower). As such, if sales growth in branded products outstrip the packaging reductions made in own-brand ranges, a company could increase its overall packaging footprint while achieving its plastic reduction target.

All companies are currently achieving targets in large part through substitution and light-weighting. Light-weighting is the process of replacing packaging material with lighter alternatives or cutting down the amount of packaging material used. While there is a role for light-weighting where packaging is excessive, it is not a long-term solution since it does not shift the market from single-use.

Substitution of one single-use material for another is a false solution to the waste crisis as it simply shifts the resource burden elsewhere. Examples of this practice include Morrisons switching 269 tonnes of plastic produce bags with paper-based alternatives, Tesco replacing 113 tonnes of plastic trays containing apples for pulp-based trays, Iceland substituting 100 million ready meal trays with board-based alternatives and Co-op replacing 78.5 tonnes of plastic ready meal trays with aluminium or board-based. Rather than light-weighting or substituting plastic for other single-use materials, we encourage a transition to packaging-free and reusable packaging alternatives. Innovative examples of packaging being taken off the shelf altogether include Waitrose removing the shrink wrap from multi-packs of tins without substitution for another material.<sup>16</sup>



Company	Plastic reduction target	Timeframe	Supporting info provided by companies
Aldi	25%	2023 (2015 baseline)	Reduce plastic packaging 25% by the end of 2023 (gram per product, relative to 2015 baseline). Currently setting interim targets to 2023.
Asda	15%	2021 (2017 baseline)	Reduce own-brand primary plastic packaging by 15% by February 2021, from a 2017 Financial Year baseline.
Co-op	6%	2020 (2018 baseline)	Reduce own-brand plastic footprint by 6% between 2019–2020, using a 2018 baseline (1,144 tonnes).
Iceland	100%	2023 (2018 baseline)	Eliminate plastic packaging from all own-brand products by the end of 2023.
Lidl	20%	2022 (2017 baseline)	By 2022, reduce own-brand primary plastic packing 20% (relative to £ revenue, based on net turnover), using 2017 baseline (4% annual reduction from 2018, when the target was introduced).
M&S	1000 tonnes	2020 (2019 baseline)	Plastic weight reduction target of 1,000 tonnes for financial year 2019/20 across primary packaging.
Morrisons	25%	2025 (2017 baseline)	25% like-for-like reduction in own-brand plastic packaging by weight by 2025 (2017 baseline). Each commercial team has been set an interim plastic weight reduction target of 4.1% per year.
Sainsbury's	50%	2025 (2018 baseline)	Reduce plastic packaging by 50% by 2025, including branded and own-branded products, as well as plastic used across operations.
Tesco	20%	2019–2020 (2018 baseline)	Reduce total own-brand plastic packaging weight by 20% and remove 1 billion pieces of plastic in the coming year (to 2020).
Waitrose	20%	2021 (2018 baseline)	Reduce single-use plastic in own-brand packaging by 20% by the end of 2021 against a 2018 baseline.

**Table 2 – Reported plastic reduction targets**

## Reuse and refill systems and packaging-free ranges

EIA and Greenpeace support a transition away from single-use packaging as the primary means of achieving plastic reduction targets, prioritising packaging-free ranges and reuse systems at scale.

The number of companies trialling reusable alternatives has considerably increased since last year, but trials currently remain small in scale and scope. For the first time, a convenience chain, SPAR, reported trials of refill stations for wine, oil, cereals, pulses and detergents in four stores. The company reported that these had “attracted new customers and additional sales” and noted the trial stores will share learnings with other SPAR retailers. Some supermarkets have claimed that the “convenience” format of their stores is a hurdle to reusable systems and we encourage SPAR to share its experience across the industry.

Other laudable initiatives include Waitrose’s “Unpacked” store and wide-ranging trials in three Morrisons stores including seeds, pasta, rice, dried fruit, frozen fruit, frozen pies and pastries. In nine stores, Morrisons is trialling an unbranded household cleaning “Bottle for Life”, sold with water-soluble pods for various household cleaning ranges. Morrisons reported that the cost of loose and refillable ranges is 10% cheaper than packaged counterparts. We strongly encourage all retailers to ensure price-parity at a minimum, in addition to other incentives to encourage reuse.



*Loose vegetables on sale at Waitrose Unpacked store, Oxford*

(Source: © Greenpeace)

Small-scale pilot projects and trials have an important role to play in designing and testing innovative ideas, providing lessons and managing risks prior to the large investments needed to shift supply chains nationwide towards reuse formats. Since supermarkets have different customers with different needs, we understand the necessity for tailored approaches. However, the time has now come for retailers to take heart from positive customer feedback and commit to progressively rolling out these systems across their estates. A number of companies are currently scoping out trials of reuse and refill systems in-store, including Asda, Co-op, Lidl, Iceland, Sainsbury’s and M&S. There is clear potential for the introduction of reusable packaging through online shopping, using reverse logistics where packaging is retrieved from customers by producers to be refilled for reuse. This is an area few companies have yet to tap into. Tesco is making progress with the “Loop” online reusable packaging range, to be launched shortly in partnership with Terracycle. Morrisons is working with Amazon and Ocado to offer refillable/reusable alternatives. Other companies suggested this was an area they were looking into, without concrete plans at this stage.

## Loose fruit and vegetable ranges

Loose fruit and vegetable sales are growing at twice the rate of plastic-packed and should be an easy first step for supermarkets to take.<sup>17</sup> Supermarkets were asked to describe plans and activities to expand loose product ranges and remove packaging from fruit and vegetable ranges. All the major supermarkets and SPAR reported trials, often citing demand from customers as a key reason for the initiative. Three companies provided information about the percentage of fruit and vegetables sold loose as a proportion of the total: Aldi (17%), Asda (18%) and Lidl (16%). Other companies reported the number of loose product lines: Co-op (30), Sainsbury's (74) and Waitrose (approx. 90). Morrisons reported it was trialling 127 varieties of loose fruit and vegetables in pilot stores. Tesco is trialling the removal of packaging from fruit, vegetables and bakery products.

Retailers seemed aware of the importance of ensuring that loose fruit and vegetable ranges were offered on a price parity with pre-packed ranges. Tesco and Asda reported that no loose line would be more expensive than its pre-packaged equivalent. Sainsbury's said it had recently reduced the prices of several loose produce items and was looking to make further reductions, while M&S is also working to ensure competitive pricing. Lidl is working to provide further incentives, including ensuring "Pick of the Week" promotions are exclusively "loose" products.

## Food waste and system change

Plastic packaging is often hailed as the best way to prevent food waste; however, the growth in food waste has increased alongside the growth in plastic packaging, with a significant proportion of food thrown away in Europe still inside plastic packaging.<sup>18</sup> Customer and staff education on food handling, preparation and preservation can result in less waste than simply adding more plastic to products, and reusable packaging and traditional approaches to preserving food can deliver the same functionality as single-use packaging.<sup>19</sup> Pre-packaged ranges can force people to buy more than required, further contributing to food waste.

The importance of behavioural change was underlined in a Morrisons loose fruit and vegetables trial, where food waste initially increased but then returned to average levels after a few weeks as staff and customers adapted their approaches to handling food. Customers noted the benefits of loose products as it allows them to purchase their desired quantity, size and quality of product – and noted that purchasing loose has potentially reduced food waste occurring at home. Morrisons staff also adapted well to the changes made in-store and to new ways of working.

Another driver behind the rise of single-use plastic packaging is the nature of modern diets, where out-of-season produce is on offer all year round, relying on single-use packaging.<sup>20</sup> Seasonality and short supply chains influence the 'necessity' of packaging. Morrisons removed plastic wrap from products following careful analysis of the food waste impact, including fresh swede, British summer-season cucumbers, asparagus and rhubarb, removing 126 tonnes of plastic. Similarly, Asda removed the plastic from British swedes with no product deterioration, while Waitrose reported that seasonality was important for determining which loose fruit and vegetables the store could offer. We urge companies to focus more on promoting local and seasonal produce, addressing air miles and packaging in parallel.

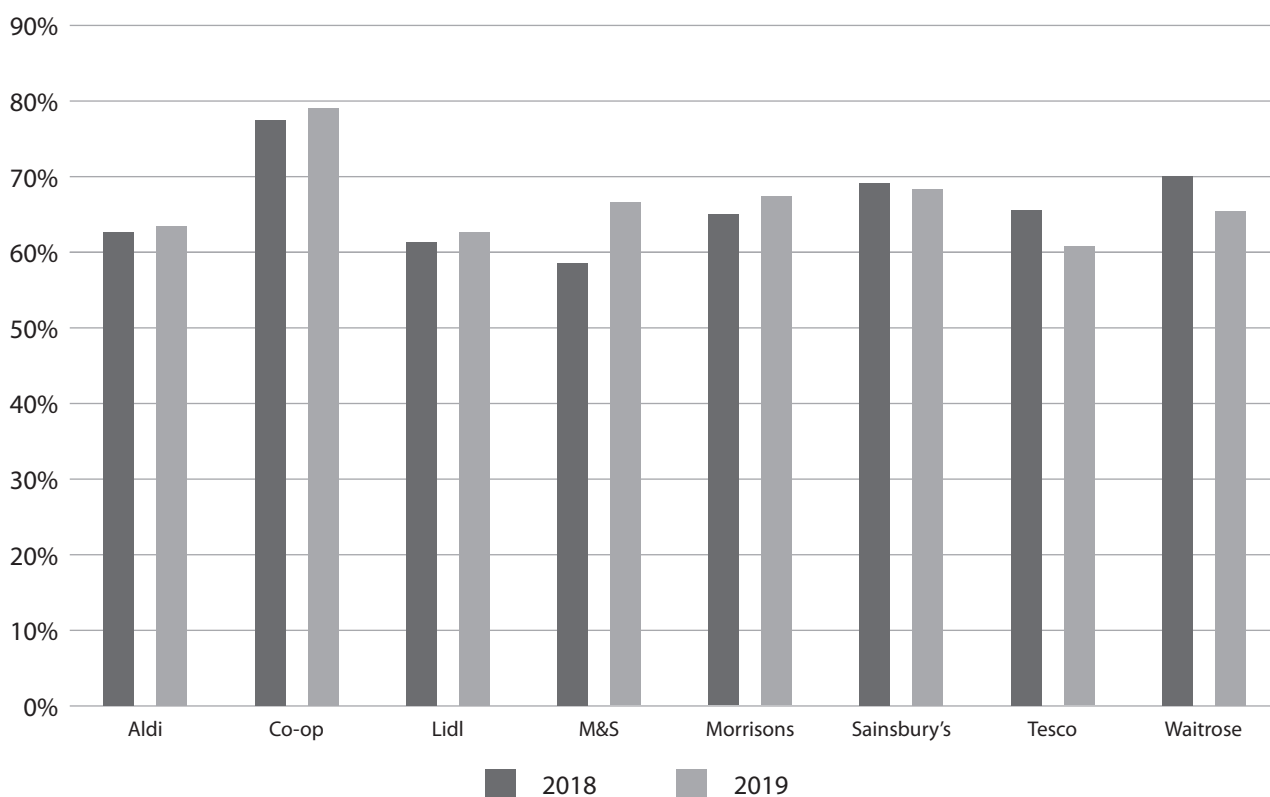
### Focus needed to address 'on-the-go' plastic waste

An area which presents additional challenges is the convenience and 'on-the-go' food market, such as 'meal deals'. The food-to-go market is currently worth £25 billion and is growing, with supermarkets supplying about 20% of lunch trips.<sup>21</sup> This is an area ripe for major transformation, as currently almost all products are sold in one-way packaging. So far there has been limited attention; M&S is the first UK supermarket to offer a reusable option in trial stores for on-the-go food options.<sup>22</sup>

Inspiration might be taken from Luxembourg for future innovation with the EcoBox,<sup>23</sup> a reusable on-the-go lunchbox solution for which customers pay a €5 deposit when purchasing food from participating stores, which is then returned when the box is brought back to a participating store. This initiative is supported by the Luxembourg Government. We encourage a public-private taskforce to be set up to review the convenience food market in the UK.

### Recyclability and recycled content of packaging

EIA and Greenpeace asked survey respondents a series of questions regarding "widely recycled" packaging, defined by On-Pack Recycling Labelling (OPRL) as when 75% or more of councils offer kerbside collections.<sup>24</sup> We note shortcomings with this definition, including that it does not account for whether an item is ultimately collected or recycled. However, OPRL remains the labelling system with the broadest industry support.



**Figure 5 – Reported own-brand packaging classified as 'widely recycled'**

Note that Iceland did not provide tonnage-based data in 2019 and Asda did not provide this data in 2018, so these companies are not included.

There has been a decrease in the amount of own-brand plastic packaging classified as “widely recycled” since reported last year, moving from an average of 64.7% to 63.8% based on overall tonnage (reported by eight companies, see Figure 5). Companies reporting a decrease included Sainsbury’s (–0.5%), Tesco (–5.6%) and Waitrose (–5%). Tesco reported this was in part due to changes in data collection and inaccuracies contained in data provided in the previous survey. Since the companies reporting a decrease include those putting the most packaging tonnage on the market, the fall in their overall recyclability has outweighed progress made by other supermarkets.

Six companies reported on the overall recyclability of plastic packaging (branded and own-brand), which averaged 62.74% based on overall tonnage. Not enough companies provided this dataset in 2018 to allow for an accurate year-on-year comparison to be made.

Reporting on recyclability by tonnage skews the real recycling story since heavier items (such as plastic bottles) are more widely recycled than the more numerous but lighter items such as plastic films, which have very low recyclability levels. As with last year, few companies were able to provide this level of detail.

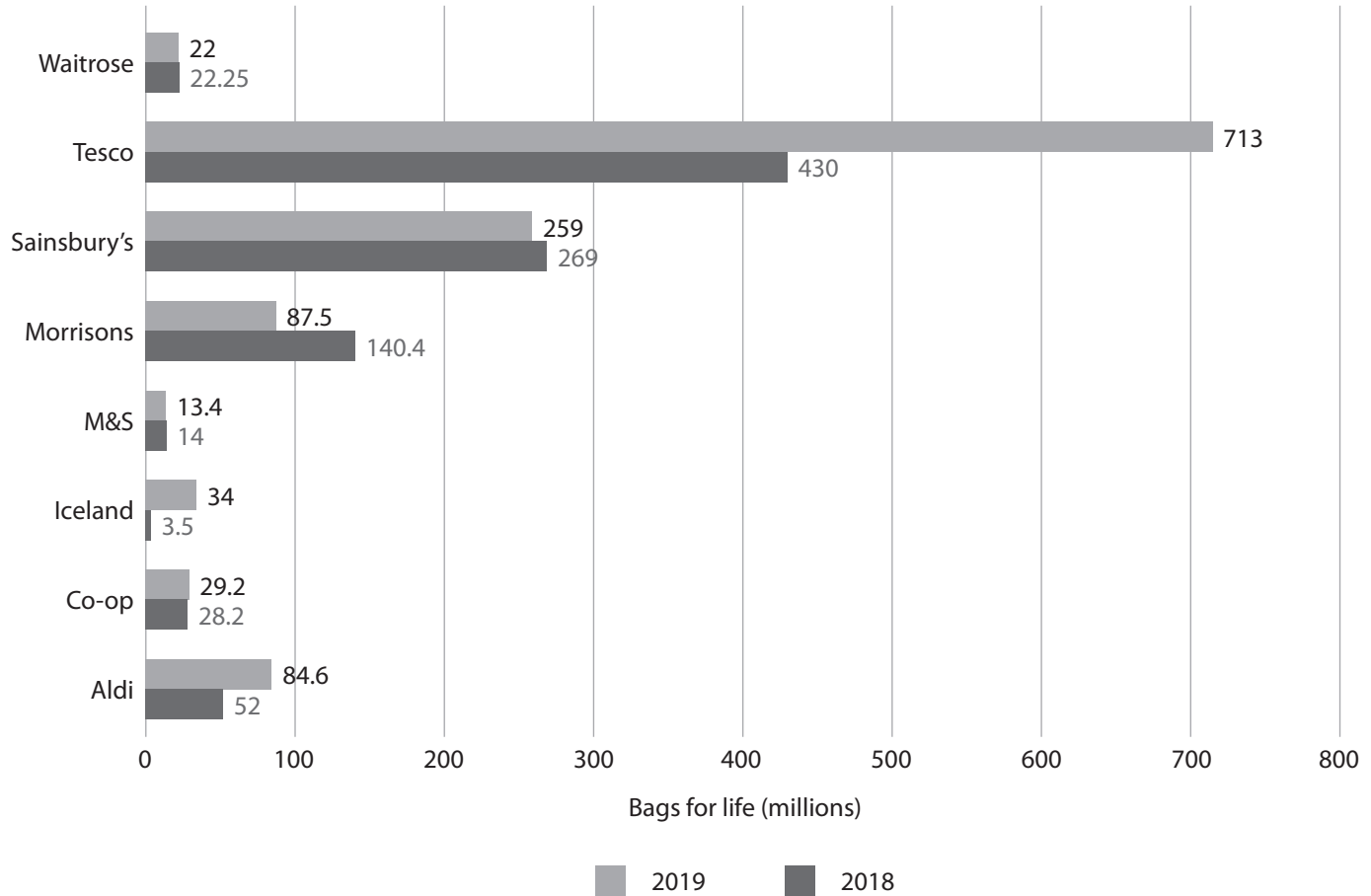
All 10 supermarkets have commitments to phase out non-recyclable packaging: by 2021 (Waitrose), 2022 (Aldi and M&S), 2023 (Sainsbury’s, Iceland, Co-op) and 2025 (Asda, Lidl, Morrisons, Tesco). Many companies have additional targets to eliminate the most problematic polymers and packaging format types within the next two years. All 10 supermarkets reported work was underway to remove undetectable black plastics, up from six companies last year.

Morrisons also reported that coloured polyethylene terephthalate (PET) (unless pre-tinted by recycled content) will be phased out from 2022 and Co-op is committed to eliminate dark plastic by the end of 2020. Companies that are signatories to the voluntary UK Plastic Pact, which includes all surveyed supermarkets other than Iceland, have agreed to phase out polyvinyl chloride (PVC) and oxo-biodegradable packaging by 2020.<sup>25</sup>

### **Plastic bags**

The introduction of the 5p carrier bag charge in England has been credited with an 83% reduction in the number of single-use plastics bags issued by the largest retailers.<sup>31</sup> However, our survey reveals a huge rise in the sale of plastic “bags for life”, demonstrating the inadequacy of the current policy, which is clearly not providing a strong enough incentive for people to stop using “bags for life” as a single-use option.

In 2018, eight companies representing 75.3% of the UK market share reported the distribution of 959 million plastic “bags for life”, equating to 12.7 million per 1% market share. In 2019, 10 companies representing 94.4% of the grocery retail market reported over 1.5 billion bags for life, equivalent to about 16 million per 1% market share. This is an increase of about 26% on a market share basis, representing approximately 54 bags for life per household in the UK from the 10 supermarkets. It is clear from this data that many people are simply swapping ‘single-use’ plastic bags for these plastic bags for ‘life’. Some companies reported an enormous jump in sales of plastic bags for life. Iceland reported a tenfold increase from 3.5 million to 34 million, while Tesco reported an increase from 430 million to 713 million. Other companies reporting an increase in sales include Aldi (from 52 to 84.6 million) and Co-op (28.2 to 29.2 million).



**Figure 8 – Plastic bags for life (in millions) reported per company in 2018 and 2019 surveys**

**Supply chain engagement**

Plastics found in supermarket aisles are just one part of a grocery retailer’s plastic footprint. From the tiny pellets used to manufacture plastic items to the fields of plastic polytunnels used to grow crops, plastic is ubiquitous throughout the supply chain. Our survey sought to gain a better understanding of how grocery retailers are looking to reduce and responsibly manage these behind-the-scenes plastics.

Our survey leaves little doubt that branded suppliers are standing in the way of a significant reduction in single-use packaging and a shift into reusable solutions. All supermarkets except for Lidl and Co-op reported an increase in their branded single-use plastic packaging footprint this year, rising from 349,022 tonnes reported last year to 366,937 tonnes.

Branded goods typically comprise 40–60% of a supermarket’s sales, although some stores such as Aldi and M&S have less than 10% branded products. Fast Moving Consumer Goods (FMCG) companies such as Unilever, Nestlé and Proctor & Gamble operate a huge number of brands and have significant influence over the market. These big brands have been identified in a recent audit of marine pollution as being behind the majority of plastic items found in clean-ups around the world.<sup>35</sup>



This year's survey found some progress towards formalising systematic and robust engagement processes with branded suppliers, although much more remains to be done to drive down branded single-use packaging. Many companies have more rigorous processes for own-brand suppliers. For example, Aldi reported that it has run packaging optimisation reviews on each food group, providing buying teams with recommendations on removing and replacing plastic and packaging, using the Clearance to Supply (CTS) control system to ensure that compliance against pledges on plastic reduction are mandatory. Products do not get CTS if they are non-compliant with mandatory policies.

Companies, including Asda, Aldi, Morrisons, Co-op, Lidl, Tesco and Sainsbury's, reported that they communicate their policies on plastic and packaging through conferences, provision of technical support, training and information-sharing sessions and written guidelines and policies. Iceland and Waitrose remain at the earlier stages of the process of formalising engagements with branded suppliers, although both are beginning to communicate their policies and commitments. Branded goods make up just 3% of M&S sales, so this is not a priority area for the company, although it has made some communications to branded suppliers.

Supermarkets must be prepared to act if brands are unable or unwilling to work towards reduction and reuse objectives. We applaud Tesco for showing leadership by committing to consider the size and suitability of all packaging and assess whether it is excessive or inappropriate, reserving the right not to stock a product.<sup>36</sup> This will help the company achieve its target to reduce plastic packaging by 20% and phase out non-recyclable materials. It is important Tesco follows through on this strong commitment, so that brands realise there will be serious consequences for inaction. Other companies such as Asda also reserve the right to delist products if they fail to meet minimum standards, although these policies have not been so publicly communicated. Supermarkets with less than 10% market share generally felt they had less influence on branded suppliers than larger grocers.

## **6. Conclusions**

Supermarkets have a major role to play in driving the transition towards zero-waste grocery supply chains. However, the findings of our report highlight the scale of the challenge ahead and the need for continued and concerted action by industry and Government. Modern dependence on single-use packaging and items is a symptom of a broken system and to reverse this trend we must address the underlying drivers. We recommend a holistic suite of solutions to avoid unintended consequences, moving forward towards a more sustainable grocery sector.

### **Reduction and reuse**

Supermarkets were scored on progress made in the past year to reduce their single-use footprints and move towards packaging-free and reusable solutions, in addition to their forward-looking targets and commitments in these areas. Seven of the 10 companies increased their overall single-use plastic packaging footprints (branded and own-brand). As a result, the amount of single-use plastic packaging placed on the market by the UK's leading supermarkets has increased by almost 20,000 tonnes since the 2018 survey, primarily driven by sales of branded goods. All 10 companies have plastic reduction targets but these need tightening to ensure a genuine shift away from single-use packaging across both branded and own-brand ranges. There remains too much focus on false solutions like light-weighting and substituting single-use plastic for other materials.

A patchwork of packaging-free and reuse initiatives are under way, which now need to be applied at scale in order to achieve deep reductions in single-use packaging. We encourage companies to follow the lead of Morrisons in setting quantified reuse targets to drive further improvements. There is increasing attention on expanding loose fruit and vegetable ranges. It is important that single-use plastic produce bags are replaced with reusable, rather than paper, alternatives; and for all loose ranges to be offered on price parity (or ideally cheaper) than packaged equivalents.

The soaring number of so-called bags for 'life' also warrants urgent attention and we call on supermarkets and policymakers to end sales of these altogether or at a minimum increase the price to 70p.

### **Recyclability and recycled content**

All supermarkets have committed to phase out non-recyclable plastic packaging by 2025 at the latest. However, despite being a major focus for industry, the overall levels of own-brand plastic packaging classed as 'widely recycled' have actually decreased since last year, from 64.7% to 63.8% when calculated by tonnage. Tonnage calculations skew the true number of non-recyclable items, since much non-recyclable packaging such as plastic films are lightweight but represent a larger number of items.

### **Supply chain and stakeholder engagements**

Our survey has identified branded product ranges as a hurdle to ending grocery retail dependence on single-use packaging. EIA and Greenpeace urge supermarkets to collectively leverage their buying power to push for a significant reduction and shift into reusable systems among these companies. If a brand is unwilling or unable to reach these objectives, supermarkets should not stock their products.

Beyond the items that customers find on the shelf, supermarkets must address supply chain plastics through enforcing policies with regard to the reduction of plastic pollution associated with fisheries, agriculture and pre-production plastic pellets. While most companies have some initiatives in these areas, best practices now need to be systematically applied at scale.

Engaging staff, customers and communities will be a key driver for reducing and reusing packaging. We encourage supermarkets to continue scaling-up these communications, ensuring the availability and accessibility of packaging-free and reusable solutions. Supermarkets can use their leverage with policymakers to support legislative reform that catalyses reduction and reuse, calling for binding targets and policy support on these areas.

### **Transparency**

The 10 leading supermarkets generally scored well on transparency, although there remain some areas where data is poor. A number of firms struggled to provide information about their sales of branded goods (including the number of units sold, recyclability of this packaging and levels of recycled content). Companies are encouraged to publicly report on their plastic footprints in both tonnage and units.

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Candidate surname

Other names

Pearson BTEC  
Level 3 Nationals  
Extended  
Diploma

Centre Number

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Learner Registration Number

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**Monday 11 January 2021**

Afternoon (Time: 2 hours 30 minutes)

Paper Reference **31629H**

**Applied Science**

**Unit 7: Contemporary Issues in Science**

**Part B**

**You will need:**

Up to four sides of A4 notes from **Part A**.

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Part A** will need to have been used in preparation for completion of **Part B**.
- **Part B** must be undertaken in a single session of 2 hours and 30 minutes in the assessment session timetabled by Pearson.
- **Part B** materials must be issued to learners for the specified session.
- **Part B** is specific to each series and this material must only be issued to learners who have been entered to undertake the task in the relevant series.
- **Part B** should be kept securely until the start of the 2 hour and 30 minute supervised assessment.

### Information

- The total mark for this paper is 50.
- The marks for each question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- The three articles are at the back of **Part B**.

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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## Instructions to Teachers/Tutors

This paper must be read in conjunction with the unit information in the specification and the BTEC Nationals *Instructions for Conducting External Assessments (ICEA)* document. See the Pearson website for details.

**Part B** set task is undertaken under supervision in a single session of 2 hours and 30 minutes timetabled by Pearson. Centres may schedule a supervised rest break during the session.

**Part B** set task requires learners to apply understanding gained through familiarisation with the articles. Learners should bring in notes as defined in **Part A**.

Learners must complete the set task using this task and answer booklet.

### Maintaining security

- Only permitted materials for the set task can be brought into the supervised environment.
- During any permitted break and at the end of the session materials must be kept securely and no items removed from the supervised environment.
- Learner notes related to **Part A** must be checked to ensure length and contents meet limitations.
- Learner notes from **Part A** will be retained securely by the centre after **Part B** and may be requested by Pearson if there is suspected malpractice.

After the session the teacher/tutor and/or invigilator will confirm that all learner work was completed independently as part of the authentication submitted to Pearson.

### Outcomes for submission

This task and answer booklet should be submitted to Pearson.

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### Instructions for Learners

Read the set task information carefully.

Complete all your work in this task and answer booklet in the spaces provided.

The session is 2 hours 30 minutes (during the day). Your teacher/tutor and/or invigilator will tell you if there is a supervised break. Plan your time carefully.

You have prepared for the set task given in this **Part B** task and answer booklet. Use your notes prepared during **Part A** if relevant. Attempt all the questions in **Part B**.

Your notes must be your own work and will be retained by your centre until results are issued.

You will complete this set task under supervision and your work will be kept securely during any breaks taken.

You must work independently throughout the supervised assessment period and should not share your work with other learners.

### Outcomes for submission

You will need to submit the following document on completion of the supervised assessment period:

- a completed **Part B** task and answer booklet.





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(Total for Question 1 = 12 marks)



2 Identify the different organisations/individuals mentioned in the articles and suggest how they may have an influence on the scientific issue.

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(Total for Question 3 = 12 marks)



4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

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**(Total for Question 5 = 15 marks)**

**TOTAL FOR PAPER = 50 MARKS**



## Part A Set Task Information

### Article 1

#### Plastic alternatives may worsen marine pollution, MPs warn

**Committee says UK should reduce use of plastics rather than replace it with other materials.**

*This is an edited version of an article that appeared in 'The Guardian' newspaper in September 2019. The article was written by Sandra Laville.*



*Plastic rubbish floating in the ocean. MPs were told that a biodegradable cup could pose as much of a problem to marine life as a conventional plastic cup.*

(© Paulo Oliveira / Alamy Stock Photo)

Compostable and biodegradable plastics could add to marine pollution because there is no infrastructure in place to make sure they break down correctly, a committee of MPs has warned.

The use of alternatives to plastic are being adopted by many food and drink companies, takeaway coffee venues, cafes and retailers. But experts giving evidence to MPs on the Environment, Food and Rural Affairs committee said the infrastructure required to deal with the new packaging was not in place and there was a lack of consumer understanding about these alternatives.

Much of the compostable packaging produced for the UK market only degrades in industrial composting facilities, rather than in home composting – but not all is sent to these facilities.

Environmental non-governmental organisations (NGOs) told the committee that the rapid introduction of such alternatives could actually increase plastic pollution.

Juliet Phillips, of the Environmental Investigation Agency (EIA), said: "If a biodegradable cup gets into the sea, it could pose just as much of a problem to marine life as a conventional plastic cup."

The environmental think tank Green Alliance said there was evidence that the term biodegradable made consumers think it was fine to discard it into the environment, which would make pollution on land and at sea even worse.





Neil Parish, chair of the Commons select committee, said: "In the backlash against plastic, other materials are being increasingly used as substitutes in food and drink packaging. We are concerned that such actions are taken without proper consideration of wider environmental consequences, such as higher carbon emissions. Compostable plastics have been introduced without the right infrastructure or consumer understanding to manage compostable waste."

Keep Britain Tidy said "the drive to introduce bioplastics, biodegradable plastics and compostable plastics is being done with limited emphasis on explaining the purpose of these materials to the public or consideration of whether they are in fact better from an environmental perspective than the plastic packaging they replace."

The committee, in a report on plastic food and drink packaging published on Thursday, said the government should focus on reducing the use of plastic packaging rather than replacing it with other materials. "Reduction is far more important than recycling, and a fundamental shift away from all single-use packaging, plastic or otherwise, is now necessary," the report said.

A government consultation on biodegradable and compostable packaging is under way. It will examine whether the standard required for all such alternative plastics should be that they can be home composted.

In evidence to the committee Libby Peake, from Green Alliance, said there was a need for standards to be re-examined, saying: "Some companies are already switching to alternatives including bio-based and compostable plastics, paper, cartons or other materials in ways that will not ultimately prove sustainable."

Peake added: "You cannot have a wholesale switchover to bio-based plastics, to aluminium, to glass or to paper, which all have environmental consequences themselves."

Vegware, a compostable packaging manufacturer, said it advised consumers to put their products in the general waste if suitable composting was not possible.

The committee said it was shocking that the government had no idea how much plastic packaging was put on to the market. This is because the system is based on producers self-declaring their packaging footprint, and only those with a turnover of more than £2m and 50 tonnes of packaging a year are obliged to release their data. MPs recommended this figure should be reduced to 1 tonne.

Phillips from the EIA welcomed the report. She said: "To date, far too little government attention has been given to addressing the root causes of the pollution crisis by challenging our unsustainable single-use society. EIA urges the government to take note of its findings, introducing a long-term strategy to catalyse a wholesale transition away from wasteful, unnecessary single-use packaging and towards reusable and refillable solutions."

Disposable, single-use plastics used for packaging food and drink – particularly cigarette butts, plastic drinking bottles, plastic caps, food wrappers, grocery bags, plastic lids, straws and stirrers – are the most common single use plastics found in the environment, according to a 2018 United Nations report.



## Article 2

### Five ways to end plastic waste

#### **From packaging made out of organic waste to nano-engineering, the winners of the \$2 million New Plastics Economy Innovation Prize provide real answers to the plastic problem**

*This is an edited version of an article published by 'Circulate News' on the Medium website in January 2018. The article was written by Joe Iles.*

There's no love lost for plastic packaging. Whether it's complicated recycling instructions on the products we buy, startling images of the impacts on wildlife, or simply the economic value lost through waste, plastics have been climbing the international agenda for years. So how do 8 million tonnes of plastic still end up in the ocean each year?

#### **Searching for the right solutions**

The urgency of the issue has led to brands, governments, NGOs and celebrities promoting a host of solutions. Reusable packaging is part of the answer, and shopping bags, water bottles and coffee cups have become popular purchases for those trying to do their bit. This works to replace certain types of packaging, but think about all the other different pieces of plastic we come into contact with every single day. Plastic film can keep food fresher for longer, and wrappers ensure medical equipment is safe for patients. In many cases, it wouldn't be hygienic, convenient or feasible to go fully reusable.

There are also a number of initiatives that aim to tackle the impacts of the problem, from scooping plastics out of the ocean to collecting litter from beaches. Again, these are valuable efforts and must continue. However, the three best known major international ocean clean-ups combined deal with less than 0.5% of the 8 million tonnes of plastics that enter the ocean annually. We need to treat the cause, as well as the symptoms. This means looking upstream to design a plastics system that works, in which this material never ends up as waste in the first place.

The challenge here is that when it's used, plastic packaging becomes dispersed. These items are distributed throughout the world in endless configurations and uses, with billions of different customers. They're often tiny, lightweight, difficult to collect and individually aren't worth that much. So to truly rethink the way we make and use plastics, we need to come up with new approaches and systemic solutions.

#### **Designing a better system**

That's the thinking behind the New Plastics Economy Innovation Prize, launched in 2017 by the Ellen MacArthur Foundation, together with the Prince of Wales' International Sustainability Unit, and funded by Wendy Schmidt. The competition invited designers and materials scientists to reinvent the types of plastic packaging that are almost never collected and recycled, and end up in landfill, incinerators or in the environment.

The winners are awarded a share of the \$2 million prize, as well as a 12-month accelerator programme, in collaboration with Think Beyond Plastic.

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The Innovation Prize is comprised of two parts. At the Our Ocean conference in October, the organisers announced the first batch of winning submissions. For this Circular Design Challenge, teams were tasked with coming up with superior alternatives to items like shampoo sachets, wrappers, straws and coffee cup lids. These 'small-format packaging items' account for 10% of all plastic packaging, and are currently not recycled and often end up in the environment.

### **Inventing circular materials**

The second group of winners is being announced at this year's Annual Meeting of the World Economic Forum in Davos. The Circular Materials Challenge seeks ways to make all plastic packaging recyclable. This means inventing better solutions than conventional packaging, and the features that we take for granted. For example, many plastic films aren't just made of one type of polymer, but a range of different materials all mixed up. Each material has a function – water resistance, airtightness, appearance – but they also make common packaging items unrecyclable.

The Circular Materials Challenge invites innovators to find alternative materials that could be recycled or composted. The five winning entries show what's possible when the principles of a circular economy are used to guide the research and development process. The intention is that these innovations not only inspire further progress, but are adopted, scaled and integrated into a working plastics industry.

### **Packaging inspired by nature**

The University of Pittsburgh team applies nano-engineering to create a recyclable material that can replace complex multi-layered packaging that is unrecyclable. This mimics the way nature uses just a few molecular building blocks to create a huge variety of materials.

### **Recyclable packaging, with help from magnets**

Aronax Technologies Spain proposes a magnetic additive that can be applied to a material, creating better air and moisture insulation – making it suitable to protect sensitive products such as coffee and medical products, while still being possible to recycle.

### **Packaging from food waste**

Working together, Full Cycle Bioplastics, Elk Packaging, and Associated Labels and Packaging make a compostable high-performance material from renewable materials, agricultural by-products and food waste to pack a broad range of products from granola bars and crisps to laundry detergent.

### **'Plastic' made from wood**

The VTT Technical Research Centre of Finland has created a compostable multi-layer material from agricultural and forestry by-products, which could be used for stand-up food pouches for products like muesli, nuts, dried fruit and rice.

### **Compostable coatings**

The Fraunhofer Institute for Silicate Research ISC has developed a coating with silicate and biopolymers that can be used in many different food packaging applications, protecting biopolymer packaging and food against premature degradation and is fully compostable.



## The circular economy transition

“These winning innovations show what’s possible when the principles of a circular economy are embraced”, said Ellen MacArthur, responding to the announcement of the winning entries. She continued: “Clean-ups continue to play an important role in dealing with the consequences of the waste plastic crisis, but we know we must do more. We urgently need solutions that address the root causes of the problem”.

In 2016, the Ellen MacArthur Foundation released the first New Plastics Economy report, which provided the alarming and widely shared statistic that if we don’t change how we make and use plastic, by 2050 the oceans could contain more plastics than fish, by weight. Viewers of the BBC series Blue Planet 2 saw this concern brought to life last year, resulting in another spike in public attention.

The New Plastics Economy reports have called for a redesign of the plastics system in line with the principles of a circular economy, a shift that will require a change in mindset.

Because try as we might, as a society we haven’t made much progress on the ‘plastics problem’. The recycling symbol has been around for over 40 years, but just 14% of plastic packaging is actually collected, and of that only 2% is properly recycled. The rest is lost during the recycling process, or goes to lower value goods. Despite best intentions, that yoghurt pot you recycled probably won’t be reborn as another yoghurt pot.

So the new goal, according to the Ellen MacArthur Foundation, is “a New Plastics Economy, in which plastics will never become waste or enter the ocean in the first place.”

## Creating system level change

While the winning innovations represent the type of solutions needed to build a plastics system that works, these teams cannot drive the transition alone.

That’s why the Innovation Prize is part of the New Plastics Economy Initiative, an ambitious collaboration led by the Ellen MacArthur Foundation, with participation from a broad group of leading companies, cities, philanthropists, policymakers, academics, students, NGOs, and citizens.

Following an announcement in Davos, there are now 11 leading brands, retailers, and packaging companies working towards using 100% reusable, recyclable or compostable packaging by 2025 or earlier.

Together, these bold commitments, along with the right policy incentives and demonstrators of radical innovation, provide us with the best chance of creating a plastics system that works.

Emblematic of the ‘take, make, dispose’ world we live in; if we can make plastic packaging fit within a circular economy, there’s reason to believe that other industries can follow suit.

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### Article 3

## Checking out on Plastics II: Breakthroughs and backtracking from supermarkets

*This is an edited version of a report published by the Environmental Investigation Agency and Greenpeace on 28 November 2019.*

### 1. Executive Summary

Our throwaway convenience culture costs the earth. Resources are being extracted, manufactured and transported to be used just once. Ever-growing mountains of mixed plastic waste are impossible to recycle and are usually dumped in landfill sites, incinerated or leaked into the natural environment. There has been an unprecedented level of public and political focus on the plastic pollution crisis in recent years. Despite this, the second survey conducted by the Environmental Investigation Agency (EIA) and Greenpeace UK reveals that little tangible progress has been made in the past year by the UK's largest supermarkets towards reducing their use of throwaway plastics.

It is time for supermarkets to accelerate commitments and scale up actions, moving from small-scale trials to support a truly circular and zero-waste economy. Supermarkets have a vital role to play as a catalyst for change, given their pivotal location in the grocery value chain between customers and suppliers. This report is a wake-up call for faster action, providing a series of recommendations and best practice case studies.

### 2. Background

Our planet faces a biodiversity and climate emergency. Without a significant turnaround in resource consumption and a shift towards circular and zero-waste economies, these problems cannot be addressed. Plastic pollution is the ugly and unacceptable face of a crisis that goes deeper. It has raised unprecedented public awareness of the scale and impact of over-consumption and our throwaway culture.

The grocery retail sector is currently highly dependent on packaging designed to be used just once and thrown away; adding fuel to the pollution and waste crisis that is evident around the world. Of the five million tonnes of plastic used in the UK every year, half is plastic packaging.<sup>2</sup>

Supermarkets are well-positioned to catalyse a fundamental shift in the systems that deliver products to people, through significantly reducing all but the most essential single-use packaging and supporting a wholesale shift into packaging-free and reusable solutions.

To date, most government and industry attention has focused on recycling, which has an important role to play but cannot solve the problem alone. In order to close the gap between rising plastic consumption and limited recycling capacity, a focus on reduction is required. Without a significant turnaround in industry trends, UK plastic packaging waste will increase by 22% between 2018 and 2030.<sup>3</sup> Currently, only about a third of UK consumer plastic packaging is officially reported as 'recycled' and about half of this is exported. This calls into question the amount ultimately recycled, given the lack of waste management infrastructure in many recipient countries, including those in South-East Asia where there are high levels of plastic pollution leakage into the marine environment.<sup>4</sup>



Plastic production and consumption affects human health; we are exposed to a large variety of toxic chemicals and harmful pollutants throughout the plastic lifecycle.<sup>5</sup> Plastic poses significant threats to marine, freshwater and terrestrial fauna; it harms soil ecosystems and emits toxic chemicals when burnt. Simply substituting single-use plastic with other single-use materials is no solution either.<sup>6</sup> All materials have environmental and social costs, including resource consumption concerns associated with pulp, paper<sup>7,8</sup> and glass;<sup>9</sup> and pollution and health risks regarding bauxite ore mining for aluminium production.<sup>10</sup>

Addressing the plastic problem requires a fundamental rethink of modern consumerism, not just fast-fix solutions. It requires us to challenge branding and marketing practices that encourage us to buy more than we need. It requires a shift to seasonal and local diets, shortening supply chains that otherwise result in huge amounts of air miles and packaging. It requires us to challenge the prevailing convenience culture and overconsumption that drive so many of the world's environmental challenges. Grocery retailers are in a prime position to help inspire the transformational changes we need.

### 3. Methodology

In May 2019, EIA and Greenpeace UK sent a survey to 16 UK grocery retailers to gain insight into how the sector is working to tackle plastic pollution, and to track progress towards targets and policies reported in our 2018 Checking Out on Plastics survey.<sup>11</sup> The survey was sent to the UK's 10 largest supermarkets and online grocery giant Ocado, as well as five other grocery retailers with more than 1,000 stores in 2018, namely Bestway (2,000 stores), Booker Group (5,556 stores), Costcutter (1,776 stores), McColl's (1,242 stores) and SPAR UK (2,555 stores).<sup>12</sup> Themes covered were consistent with the 2018 survey, with additional questions to track progress towards commitments and targets.

Of the leading UK grocery retailers, the only non-respondent was Ocado, which also failed to respond to the 2018 survey. The response rate for convenience chain stores was poor again this year; only Costcutter and McColl's provided a full response to the survey while SPAR UK submitted a partial response. A large data gap therefore remains among the UK's leading convenience chains, including those owned by Booker Group (such as Premier, Londis and Budgens) and Best-One.

Most of the data collected in this year's survey covers the 2018 calendar year; however, some supermarkets provided data covering slightly different timeframes, namely Aldi (April 2018–19) and Morrisons (February 2018–19).

In order to analyse the data provided by supermarkets in the 2018 and 2019 surveys in relation to their market share, we used data from Nielsen Total Till and Nielsen Homescan. This depicts the value-based market share of each company during a 12-week period in 2017 and 2018, as well as the change in sales experienced by each company in the same timeframe.

We note that a direct linear relationship between market share and packaging volume is not necessarily expected, given that discounters sell a greater number of (packaged) units per pound sterling than other supermarkets.

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The survey contained 20 questions aimed at understanding the performance of retailers according to the following categories:

1. Reduction in plastic footprint and use of reusables: Progress made since the last survey to reduce single-use items and packaging and expand packaging-free and reusable ranges, assessed where relevant against targets and milestones reported in the 2018 survey
2. Forward-looking commitments on reduction and reuse: Level of ambition regarding future-looking reduction and reuse commitments and targets
3. Recyclability and recycled content: Targets, commitments and progress made on removing non-recyclable plastics and increasing recycled content levels
4. Supply chain and stakeholder engagement: Engagement with suppliers (including branded suppliers, agricultural and fisheries suppliers and regarding pre-production plastic pellets), interactions with staff and customers about reducing plastic use, and public policy positions on government proposals such as Deposit Return Schemes
5. Transparency: Provision of full data regarding plastic items and packaging, as well as information on recyclability and recycled content and public policy positions.

### Scoring methodology

Supermarket responses were reviewed against objective criteria to determine a numerical score based on the ambition level of the response, with questions grouped into the five categories. A combined score was then determined for each category. Questions that were not relevant to a particular retailer were removed from their scoring criteria (e.g. if the retailer did not offer online shopping). The categories were weighted to place a greater emphasis on achieved reductions of single-use plastic and expansion of reusable and refillable ranges, as well as forward-looking commitments on these areas. This year, points were subtracted to penalise a lack of progress towards targets, as well as for absolute increases in plastic packaging and items over the past 12 months. Total scores were calculated for each retailer and ranked from highest to lowest to produce an overall league table. A third-party organisation, 3Keel, was consulted in the development of the scorecard (see Table 1).

Convenience chains were not included in the league table, given the limited data and different circumstances faced by these companies (e.g. lack of direct control over franchise stores).

### 4. Results of supermarket ranking

The 2019 ranking reflects progress made over the past year to deliver tangible reductions in single-use plastic and move towards packaging-free and reuse solutions. As with last year, the scoring is very close between companies, with few achieving high marks under any of the categories. Even among leading companies there are areas where significant progress is needed.

This year's leader, Waitrose, was one of the few companies that reduced its overall plastic footprint and is making progress in scaling-up packaging-free and refill solutions. Morrisons has also shown initiative in this area; we applaud its introduction of the first quantified target to increase sales through reuse and refill ranges.



Looking at last year's survey ranking, we see good progress made by Sainsbury's in introducing ambitious plastic reduction targets and committing to scale-up reuse ranges. Iceland has slipped from first place as other companies increase the ambition of commitments on reduction and reuse. In order for the company to reclaim the lead, further progress will be needed on scaling-up packaging-free and reuse solutions, in addition to engaging with branded suppliers about reducing their plastic footprints.

Companies at the bottom of the league table had increased their overall plastic footprint since last year and had generally made the least progress to date on trialling and expanding packaging-free and reusable solutions. These companies had experienced sales growth and noted challenges in reducing their overall plastic footprint. With the right systems and approach in place it will be possible to increase sales while reducing throwaway packaging.

	Overall % score	Progress made on reduction and reuse	Future plans on reduction and reuse	Recyclability/ recycled content	Influencing suppliers	Transparency
Waitrose	52%	37%	52%	33%	64%	92%
Morrisons	51%	35%	44%	40%	64%	92%
Sainsbury's	44%	21%	56%	47%	60%	72%
M&S	43.7%	24%	26%	60%	55%	79%
Co-op	43.6%	18%	30%	50%	68%	82%
Tesco	43%	19%	52%	23%	80%	77%
Iceland	42.3%	26%	56%	20%	48%	74%
Lidl	41.6%	26%	30%	30%	52%	87%
Asda	39.1%	23%	33%	30%	56%	77%
Aldi	38%	13%	37%	37%	40%	87%

**Table 1 – Supermarkets' 2019 plastic policies revealed**



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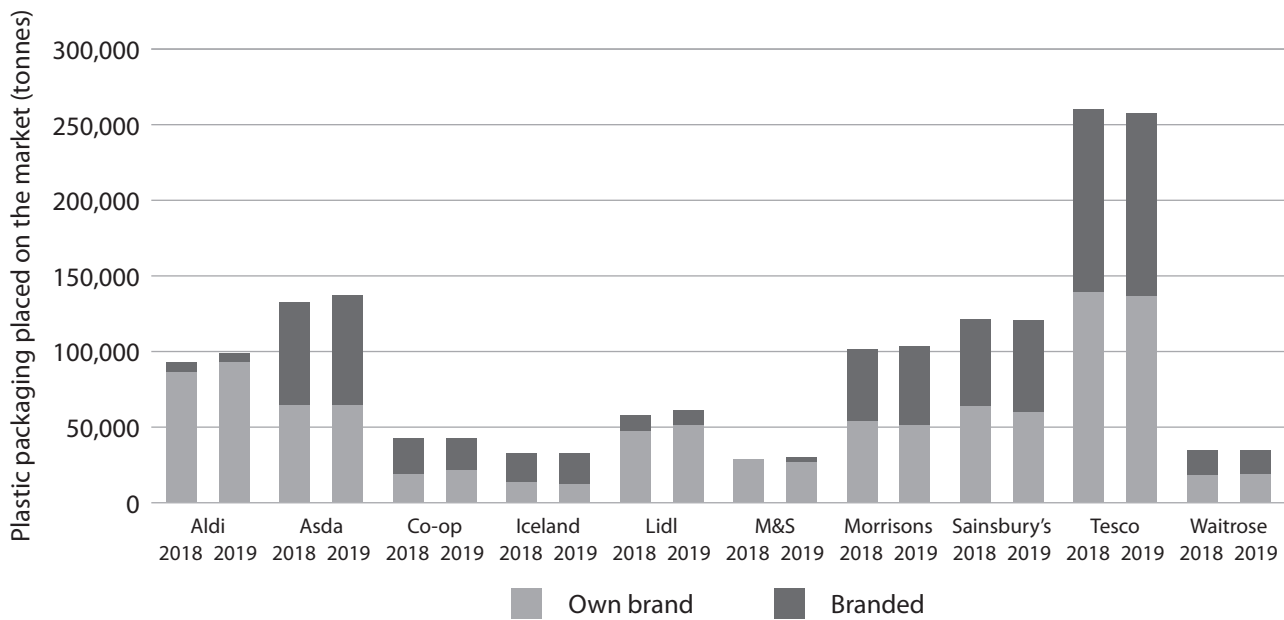
## 5. Summary of survey responses

### Amount of single-use plastic packaging put on the market

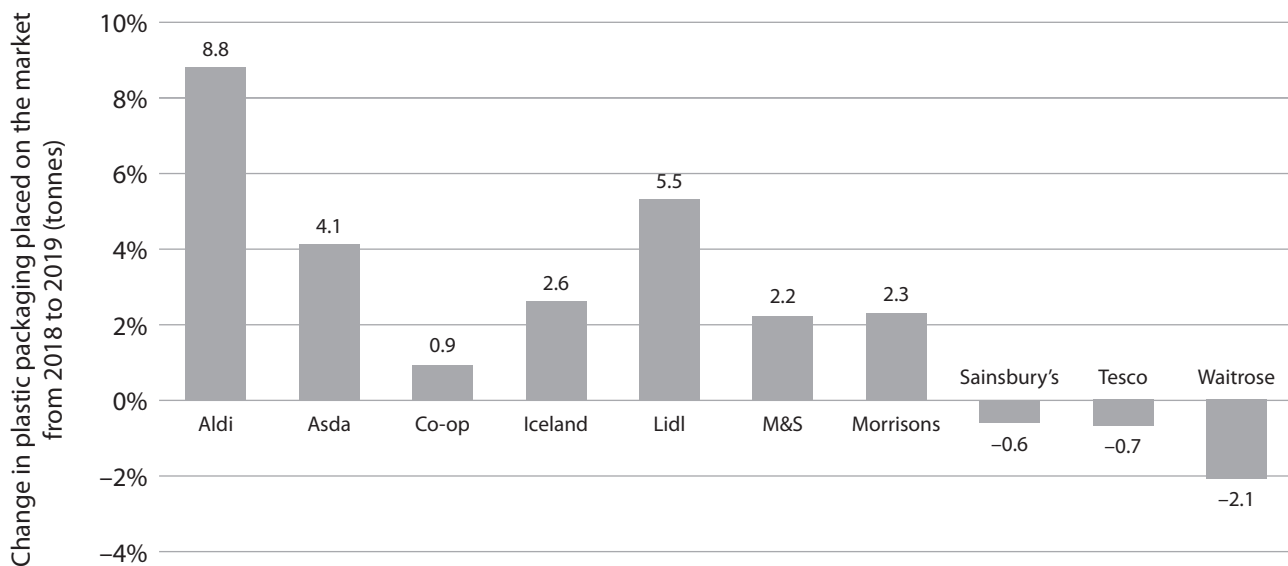
#### Absolute packaging footprint

Single-use plastic packaging used by the 10 UK supermarket giants increased from 886,000 tonnes in 2017 to 903,000 tonnes in 2018. Of this, 536,000 tonnes was from own-brand goods, a very slight decrease from last year's figure of 537,000 tonnes. Packaging from branded items amounted to 367,000 tonnes, a rise from last year's estimate of 349,000 tonnes.

Seven out of 10 supermarkets reported a higher plastic packaging tonnage in 2019 than in the previous survey (see Figures 1 and 2).



**Figure 1 – Plastic packaging tonnage (branded and own-branded) placed on the market reported in 2018 and 2019 surveys**



**Figure 2 – Change in total plastic packaging footprint (tonnes) reported in 2018 and 2019 surveys**



Only Waitrose, Tesco and Sainsbury's reported slight decreases in their overall plastic packaging footprint. The amount of packaging companies place on the market is proportionate to their market share, with year-on-year growth in packaging generally correlated to increases in sales. The companies reporting the largest absolute growth include Aldi (up by more than 8,000 tonnes, sales up 12.1%), Asda (5,300 tonnes, sales up 3.5%) and Lidl (3,000 tonnes, sales up 8.1%). Tesco occupies more than a quarter of the UK market (27.1%) and accounts for the largest amount of primary plastic packaging (259,000 tonnes). Sainsbury's, with a 14.5% market share, placed 119,000 tonnes of plastic packaging on the shelves, while Asda with a 13.7% market share distributed 135,000 tonnes.

### **Reduction targets – assessment of commitments and progress**

The top 10 UK supermarkets all now have targets to reduce their plastic packaging footprint. Among the most ambitious are Iceland (100% removal of single-use plastic packaging from own-brand by the end of 2023), Sainsbury's (50% plastic packaging reduction across branded and own-brand packaging ranges by 2025) and Tesco's commitment to reduce plastic packaging by 20% over two years across own-brand plastic packaging, removing one billion pieces of plastic by the end of 2020 (see Table 2).

An industry-wide trend is for the adoption of "relative" targets based on a past ratio of an amount of plastic and amount of sales. This does not guarantee an overall reduction in a company's plastic footprint. For example, if a company was putting one tonne of plastic on the market per £1,000 spent in 2015 and reduced this to 0.8 tonnes of plastic per £1,000 spent in 2020 – but had significantly increased in sales volume over this time, meaning that more £1,000s were being spent – then the total amount of plastic will have increased even though the company would have met its target. On the flip side, a decrease in packaging which is mainly attributable to a decrease in sales is no cause for celebration either.

Another limitation of many current plastic reduction targets is that they are limited to own-brand ranges. Branded goods typically make up 40–60% of a supermarket's sales (with the exception of Lidl, M&S and Aldi which are significantly lower). As such, if sales growth in branded products outstrip the packaging reductions made in own-brand ranges, a company could increase its overall packaging footprint while achieving its plastic reduction target.

All companies are currently achieving targets in large part through substitution and light-weighting. Light-weighting is the process of replacing packaging material with lighter alternatives or cutting down the amount of packaging material used. While there is a role for light-weighting where packaging is excessive, it is not a long-term solution since it does not shift the market from single-use.

Substitution of one single-use material for another is a false solution to the waste crisis as it simply shifts the resource burden elsewhere. Examples of this practice include Morrisons switching 269 tonnes of plastic produce bags with paper-based alternatives, Tesco replacing 113 tonnes of plastic trays containing apples for pulp-based trays, Iceland substituting 100 million ready meal trays with board-based alternatives and Co-op replacing 78.5 tonnes of plastic ready meal trays with aluminium or board-based. Rather than light-weighting or substituting plastic for other single-use materials, we encourage a transition to packaging-free and reusable packaging alternatives. Innovative examples of packaging being taken off the shelf altogether include Waitrose removing the shrink wrap from multi-packs of tins without substitution for another material.<sup>16</sup>

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Company	Plastic reduction target	Timeframe	Supporting info provided by companies
Aldi	25%	2023 (2015 baseline)	Reduce plastic packaging 25% by the end of 2023 (gram per product, relative to 2015 baseline). Currently setting interim targets to 2023.
Asda	15%	2021 (2017 baseline)	Reduce own-brand primary plastic packaging by 15% by February 2021, from a 2017 Financial Year baseline.
Co-op	6%	2020 (2018 baseline)	Reduce own-brand plastic footprint by 6% between 2019–2020, using a 2018 baseline (1,144 tonnes).
Iceland	100%	2023 (2018 baseline)	Eliminate plastic packaging from all own-brand products by the end of 2023.
Lidl	20%	2022 (2017 baseline)	By 2022, reduce own-brand primary plastic packing 20% (relative to £ revenue, based on net turnover), using 2017 baseline (4% annual reduction from 2018, when the target was introduced).
M&S	1000 tonnes	2020 (2019 baseline)	Plastic weight reduction target of 1,000 tonnes for financial year 2019/20 across primary packaging.
Morrisons	25%	2025 (2017 baseline)	25% like-for-like reduction in own-brand plastic packaging by weight by 2025 (2017 baseline). Each commercial team has been set an interim plastic weight reduction target of 4.1% per year.
Sainsbury's	50%	2025 (2018 baseline)	Reduce plastic packaging by 50% by 2025, including branded and own-branded products, as well as plastic used across operations.
Tesco	20%	2019–2020 (2018 baseline)	Reduce total own-brand plastic packaging weight by 20% and remove 1 billion pieces of plastic in the coming year (to 2020).
Waitrose	20%	2021 (2018 baseline)	Reduce single-use plastic in own-brand packaging by 20% by the end of 2021 against a 2018 baseline.

**Table 2 – Reported plastic reduction targets**



## Reuse and refill systems and packaging-free ranges

EIA and Greenpeace support a transition away from single-use packaging as the primary means of achieving plastic reduction targets, prioritising packaging-free ranges and reuse systems at scale.

The number of companies trialling reusable alternatives has considerably increased since last year, but trials currently remain small in scale and scope. For the first time, a convenience chain, SPAR, reported trials of refill stations for wine, oil, cereals, pulses and detergents in four stores. The company reported that these had “attracted new customers and additional sales” and noted the trial stores will share learnings with other SPAR retailers. Some supermarkets have claimed that the “convenience” format of their stores is a hurdle to reusable systems and we encourage SPAR to share its experience across the industry.

Other laudable initiatives include Waitrose’s “Unpacked” store and wide-ranging trials in three Morrisons stores including seeds, pasta, rice, dried fruit, frozen fruit, frozen pies and pastries. In nine stores, Morrisons is trialling an unbranded household cleaning “Bottle for Life”, sold with water-soluble pods for various household cleaning ranges. Morrisons reported that the cost of loose and refillable ranges is 10% cheaper than packaged counterparts. We strongly encourage all retailers to ensure price-parity at a minimum, in addition to other incentives to encourage reuse.



*Loose vegetables on sale at Waitrose Unpacked store, Oxford*

(Source: © Greenpeace)

Small-scale pilot projects and trials have an important role to play in designing and testing innovative ideas, providing lessons and managing risks prior to the large investments needed to shift supply chains nationwide towards reuse formats. Since supermarkets have different customers with different needs, we understand the necessity for tailored approaches. However, the time has now come for retailers to take heart from positive customer feedback and commit to progressively rolling out these systems across their estates. A number of companies are currently scoping out trials of reuse and refill systems in-store, including Asda, Co-op, Lidl, Iceland, Sainsbury’s and M&S. There is clear potential for the introduction of reusable packaging through online shopping, using reverse logistics where packaging is retrieved from customers by producers to be refilled for reuse. This is an area few companies have yet to tap into. Tesco is making progress with the “Loop” online reusable packaging range, to be launched shortly in partnership with Terracycle. Morrisons is working with Amazon and Ocado to offer refillable/reusable alternatives. Other companies suggested this was an area they were looking into, without concrete plans at this stage.



## Loose fruit and vegetable ranges

Loose fruit and vegetable sales are growing at twice the rate of plastic-packed and should be an easy first step for supermarkets to take.<sup>17</sup> Supermarkets were asked to describe plans and activities to expand loose product ranges and remove packaging from fruit and vegetable ranges. All the major supermarkets and SPAR reported trials, often citing demand from customers as a key reason for the initiative. Three companies provided information about the percentage of fruit and vegetables sold loose as a proportion of the total: Aldi (17%), Asda (18%) and Lidl (16%). Other companies reported the number of loose product lines: Co-op (30), Sainsbury's (74) and Waitrose (approx. 90). Morrisons reported it was trialling 127 varieties of loose fruit and vegetables in pilot stores. Tesco is trialling the removal of packaging from fruit, vegetables and bakery products.

Retailers seemed aware of the importance of ensuring that loose fruit and vegetable ranges were offered on a price parity with pre-packed ranges. Tesco and Asda reported that no loose line would be more expensive than its pre-packaged equivalent. Sainsbury's said it had recently reduced the prices of several loose produce items and was looking to make further reductions, while M&S is also working to ensure competitive pricing. Lidl is working to provide further incentives, including ensuring "Pick of the Week" promotions are exclusively "loose" products.

## Food waste and system change

Plastic packaging is often hailed as the best way to prevent food waste; however, the growth in food waste has increased alongside the growth in plastic packaging, with a significant proportion of food thrown away in Europe still inside plastic packaging.<sup>18</sup> Customer and staff education on food handling, preparation and preservation can result in less waste than simply adding more plastic to products, and reusable packaging and traditional approaches to preserving food can deliver the same functionality as single-use packaging.<sup>19</sup> Pre-packaged ranges can force people to buy more than required, further contributing to food waste.

The importance of behavioural change was underlined in a Morrisons loose fruit and vegetables trial, where food waste initially increased but then returned to average levels after a few weeks as staff and customers adapted their approaches to handling food. Customers noted the benefits of loose products as it allows them to purchase their desired quantity, size and quality of product – and noted that purchasing loose has potentially reduced food waste occurring at home. Morrisons staff also adapted well to the changes made in-store and to new ways of working.

Another driver behind the rise of single-use plastic packaging is the nature of modern diets, where out-of-season produce is on offer all year round, relying on single-use packaging.<sup>20</sup> Seasonality and short supply chains influence the 'necessity' of packaging. Morrisons removed plastic wrap from products following careful analysis of the food waste impact, including fresh swede, British summer-season cucumbers, asparagus and rhubarb, removing 126 tonnes of plastic. Similarly, Asda removed the plastic from British swedes with no product deterioration, while Waitrose reported that seasonality was important for determining which loose fruit and vegetables the store could offer. We urge companies to focus more on promoting local and seasonal produce, addressing air miles and packaging in parallel.





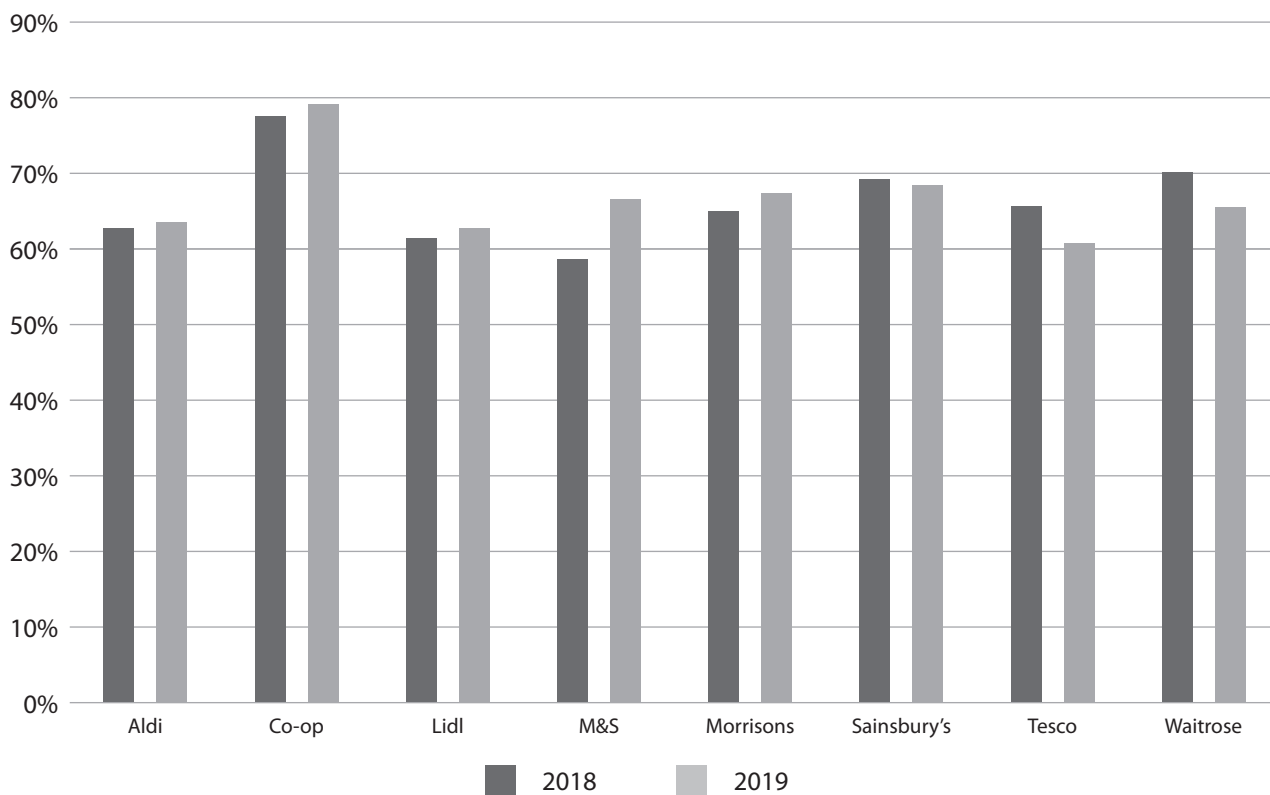
### Focus needed to address 'on-the-go' plastic waste

An area which presents additional challenges is the convenience and 'on-the-go' food market, such as 'meal deals'. The food-to-go market is currently worth £25 billion and is growing, with supermarkets supplying about 20% of lunch trips.<sup>21</sup> This is an area ripe for major transformation, as currently almost all products are sold in one-way packaging. So far there has been limited attention; M&S is the first UK supermarket to offer a reusable option in trial stores for on-the-go food options.<sup>22</sup>

Inspiration might be taken from Luxembourg for future innovation with the EcoBox,<sup>23</sup> a reusable on-the-go lunchbox solution for which customers pay a €5 deposit when purchasing food from participating stores, which is then returned when the box is brought back to a participating store. This initiative is supported by the Luxembourg Government. We encourage a public-private taskforce to be set up to review the convenience food market in the UK.

### Recyclability and recycled content of packaging

EIA and Greenpeace asked survey respondents a series of questions regarding "widely recycled" packaging, defined by On-Pack Recycling Labelling (OPRL) as when 75% or more of councils offer kerbside collections.<sup>24</sup> We note shortcomings with this definition, including that it does not account for whether an item is ultimately collected or recycled. However, OPRL remains the labelling system with the broadest industry support.



**Figure 5 – Reported own-brand packaging classified as 'widely recycled'**

Note that Iceland did not provide tonnage-based data in 2019 and Asda did not provide this data in 2018, so these companies are not included.



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There has been a decrease in the amount of own-brand plastic packaging classified as “widely recycled” since reported last year, moving from an average of 64.7% to 63.8% based on overall tonnage (reported by eight companies, see Figure 5). Companies reporting a decrease included Sainsbury’s (–0.5%), Tesco (–5.6%) and Waitrose (–5%). Tesco reported this was in part due to changes in data collection and inaccuracies contained in data provided in the previous survey. Since the companies reporting a decrease include those putting the most packaging tonnage on the market, the fall in their overall recyclability has outweighed progress made by other supermarkets.

Six companies reported on the overall recyclability of plastic packaging (branded and own-brand), which averaged 62.74% based on overall tonnage. Not enough companies provided this dataset in 2018 to allow for an accurate year-on-year comparison to be made.

Reporting on recyclability by tonnage skews the real recycling story since heavier items (such as plastic bottles) are more widely recycled than the more numerous but lighter items such as plastic films, which have very low recyclability levels. As with last year, few companies were able to provide this level of detail.

All 10 supermarkets have commitments to phase out non-recyclable packaging: by 2021 (Waitrose), 2022 (Aldi and M&S), 2023 (Sainsbury’s, Iceland, Co-op) and 2025 (Asda, Lidl, Morrisons, Tesco). Many companies have additional targets to eliminate the most problematic polymers and packaging format types within the next two years. All 10 supermarkets reported work was underway to remove undetectable black plastics, up from six companies last year.

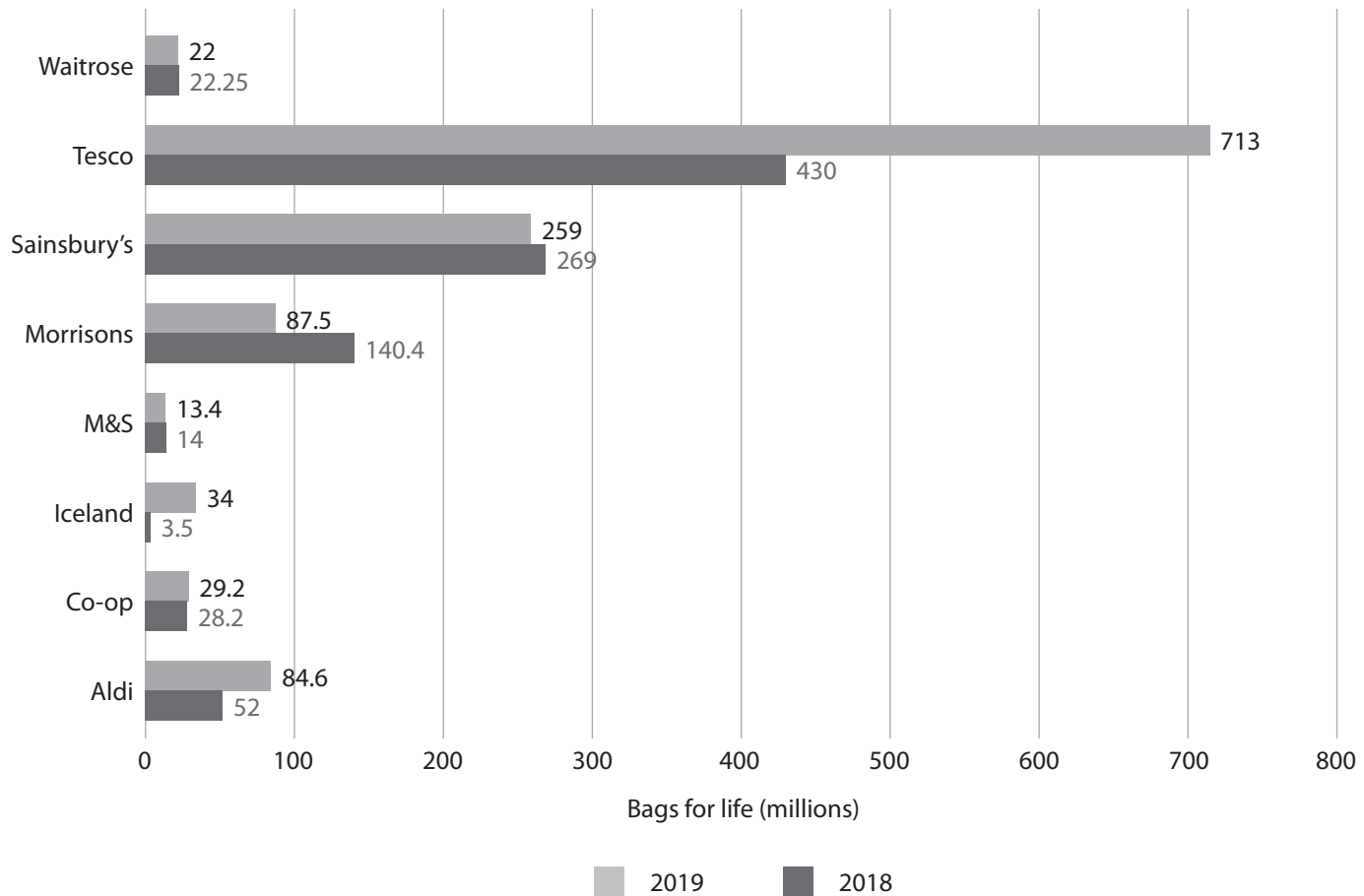
Morrisons also reported that coloured polyethylene terephthalate (PET) (unless pre-tinted by recycled content) will be phased out from 2022 and Co-op is committed to eliminate dark plastic by the end of 2020. Companies that are signatories to the voluntary UK Plastic Pact, which includes all surveyed supermarkets other than Iceland, have agreed to phase out polyvinyl chloride (PVC) and oxo-biodegradable packaging by 2020.<sup>25</sup>

### Plastic bags

The introduction of the 5p carrier bag charge in England has been credited with an 83% reduction in the number of single-use plastics bags issued by the largest retailers.<sup>31</sup> However, our survey reveals a huge rise in the sale of plastic “bags for life”, demonstrating the inadequacy of the current policy, which is clearly not providing a strong enough incentive for people to stop using “bags for life” as a single-use option.

In 2018, eight companies representing 75.3% of the UK market share reported the distribution of 959 million plastic “bags for life”, equating to 12.7 million per 1% market share. In 2019, 10 companies representing 94.4% of the grocery retail market reported over 1.5 billion bags for life, equivalent to about 16 million per 1% market share. This is an increase of about 26% on a market share basis, representing approximately 54 bags for life per household in the UK from the 10 supermarkets. It is clear from this data that many people are simply swapping ‘single-use’ plastic bags for these plastic bags for ‘life’. Some companies reported an enormous jump in sales of plastic bags for life. Iceland reported a tenfold increase from 3.5 million to 34 million, while Tesco reported an increase from 430 million to 713 million. Other companies reporting an increase in sales include Aldi (from 52 to 84.6 million) and Co-op (28.2 to 29.2 million).





**Figure 8 – Plastic bags for life (in millions) reported per company in 2018 and 2019 surveys**

### Supply chain engagement

Plastics found in supermarket aisles are just one part of a grocery retailer’s plastic footprint. From the tiny pellets used to manufacture plastic items to the fields of plastic polytunnels used to grow crops, plastic is ubiquitous throughout the supply chain. Our survey sought to gain a better understanding of how grocery retailers are looking to reduce and responsibly manage these behind-the-scenes plastics.

Our survey leaves little doubt that branded suppliers are standing in the way of a significant reduction in single-use packaging and a shift into reusable solutions. All supermarkets except for Lidl and Co-op reported an increase in their branded single-use plastic packaging footprint this year, rising from 349,022 tonnes reported last year to 366,937 tonnes.

Branded goods typically comprise 40–60% of a supermarket’s sales, although some stores such as Aldi and M&S have less than 10% branded products. Fast Moving Consumer Goods (FMCG) companies such as Unilever, Nestlé and Proctor & Gamble operate a huge number of brands and have significant influence over the market. These big brands have been identified in a recent audit of marine pollution as being behind the majority of plastic items found in clean-ups around the world.<sup>35</sup>



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This year's survey found some progress towards formalising systematic and robust engagement processes with branded suppliers, although much more remains to be done to drive down branded single-use packaging. Many companies have more rigorous processes for own-brand suppliers. For example, Aldi reported that it has run packaging optimisation reviews on each food group, providing buying teams with recommendations on removing and replacing plastic and packaging, using the Clearance to Supply (CTS) control system to ensure that compliance against pledges on plastic reduction are mandatory. Products do not get CTS if they are non-compliant with mandatory policies.

Companies, including Asda, Aldi, Morrisons, Co-op, Lidl, Tesco and Sainsbury's, reported that they communicate their policies on plastic and packaging through conferences, provision of technical support, training and information-sharing sessions and written guidelines and policies. Iceland and Waitrose remain at the earlier stages of the process of formalising engagements with branded suppliers, although both are beginning to communicate their policies and commitments. Branded goods make up just 3% of M&S sales, so this is not a priority area for the company, although it has made some communications to branded suppliers.

Supermarkets must be prepared to act if brands are unable or unwilling to work towards reduction and reuse objectives. We applaud Tesco for showing leadership by committing to consider the size and suitability of all packaging and assess whether it is excessive or inappropriate, reserving the right not to stock a product.<sup>36</sup> This will help the company achieve its target to reduce plastic packaging by 20% and phase out non-recyclable materials. It is important Tesco follows through on this strong commitment, so that brands realise there will be serious consequences for inaction. Other companies such as Asda also reserve the right to delist products if they fail to meet minimum standards, although these policies have not been so publicly communicated. Supermarkets with less than 10% market share generally felt they had less influence on branded suppliers than larger grocers.

## 6. Conclusions

Supermarkets have a major role to play in driving the transition towards zero-waste grocery supply chains. However, the findings of our report highlight the scale of the challenge ahead and the need for continued and concerted action by industry and Government. Modern dependence on single-use packaging and items is a symptom of a broken system and to reverse this trend we must address the underlying drivers. We recommend a holistic suite of solutions to avoid unintended consequences, moving forward towards a more sustainable grocery sector.

### Reduction and reuse

Supermarkets were scored on progress made in the past year to reduce their single-use footprints and move towards packaging-free and reusable solutions, in addition to their forward-looking targets and commitments in these areas. Seven of the 10 companies increased their overall single-use plastic packaging footprints (branded and own-brand). As a result, the amount of single-use plastic packaging placed on the market by the UK's leading supermarkets has increased by almost 20,000 tonnes since the 2018 survey, primarily driven by sales of branded goods. All 10 companies have plastic reduction targets but these need tightening to ensure a genuine shift away from single-use packaging across both branded and own-brand ranges. There remains too much focus on false solutions like light-weighting and substituting single-use plastic for other materials.





A patchwork of packaging-free and reuse initiatives are under way, which now need to be applied at scale in order to achieve deep reductions in single-use packaging. We encourage companies to follow the lead of Morrisons in setting quantified reuse targets to drive further improvements. There is increasing attention on expanding loose fruit and vegetable ranges. It is important that single-use plastic produce bags are replaced with reusable, rather than paper, alternatives; and for all loose ranges to be offered on price parity (or ideally cheaper) than packaged equivalents.

The soaring number of so-called bags for 'life' also warrants urgent attention and we call on supermarkets and policymakers to end sales of these altogether or at a minimum increase the price to 70p.

### **Recyclability and recycled content**

All supermarkets have committed to phase out non-recyclable plastic packaging by 2025 at the latest. However, despite being a major focus for industry, the overall levels of own-brand plastic packaging classed as 'widely recycled' have actually decreased since last year, from 64.7% to 63.8% when calculated by tonnage. Tonnage calculations skew the true number of non-recyclable items, since much non-recyclable packaging such as plastic films are lightweight but represent a larger number of items.

### **Supply chain and stakeholder engagements**

Our survey has identified branded product ranges as a hurdle to ending grocery retail dependence on single-use packaging. EIA and Greenpeace urge supermarkets to collectively leverage their buying power to push for a significant reduction and shift into reusable systems among these companies. If a brand is unwilling or unable to reach these objectives, supermarkets should not stock their products.

Beyond the items that customers find on the shelf, supermarkets must address supply chain plastics through enforcing policies with regard to the reduction of plastic pollution associated with fisheries, agriculture and pre-production plastic pellets. While most companies have some initiatives in these areas, best practices now need to be systematically applied at scale.

Engaging staff, customers and communities will be a key driver for reducing and reusing packaging. We encourage supermarkets to continue scaling-up these communications, ensuring the availability and accessibility of packaging-free and reusable solutions. Supermarkets can use their leverage with policymakers to support legislative reform that catalyses reduction and reuse, calling for binding targets and policy support on these areas.

### **Transparency**

The 10 leading supermarkets generally scored well on transparency, although there remain some areas where data is poor. A number of firms struggled to provide information about their sales of branded goods (including the number of units sold, recyclability of this packaging and levels of recycled content). Companies are encouraged to publicly report on their plastic footprints in both tonnage and units.

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