

Frequently Asked Questions About Plastic

This document has been produced by the British Plastics Federation.

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording and/or otherwise, without the prior written permission of the publishers. While all reasonable steps have been taken to ensure that the information contained within this document is correct, the British Plastics Federation can make no warranties or representations of any kind as to the content and, to the maximum extent permitted by law, accept no liability whatsoever for the same including without limit, for direct, indirect or consequential loss, business interruption, loss of profits, production, contracts or goodwill.



British Plastics Federation
BPF House, 6 Bath Place Rivington Street
London EC2A 3JE

First published June 2021
©2021 British Plastics Federation

Contents

Is plastic packaging worst when it comes to climate change?	4
Is some plastic completely unrecyclable?	5
Does only 9% of plastic get recycled?	6
Is the amount of plastic packaging we use massively increasing?	8
Is it better to buy goods with no packaging?	9
Will there be more plastic in the ocean than fish by 2050?	12





Plastic plays an essential role in everyone's life in one way or another – but there are a lot of questions people have about the impact of using plastic on our planet. Used plastic should be perceived as a valuable resource and the material should be kept in use for as long as possible. Already resource efficient, using recycled material lowers a product's carbon footprint further.

Used plastic products should not end up in the ocean. They should be kept in a circular system wherever possible. When it is used intelligently, plastic plays a positive role in reducing carbon emissions and food waste.

Here we examine some of the frequently asked questions about plastic.

Is plastic packaging worst when it comes to climate change?

Studies have looked at what would happen if we replaced plastic packaging with alternatives. Two found that GHGs would increase nearly three times and a third found they would almost double.⁶ Another 2020 study concluded that, compared to alternative materials, plastic packaging is often the least damaging when it comes to carbon emissions.⁷

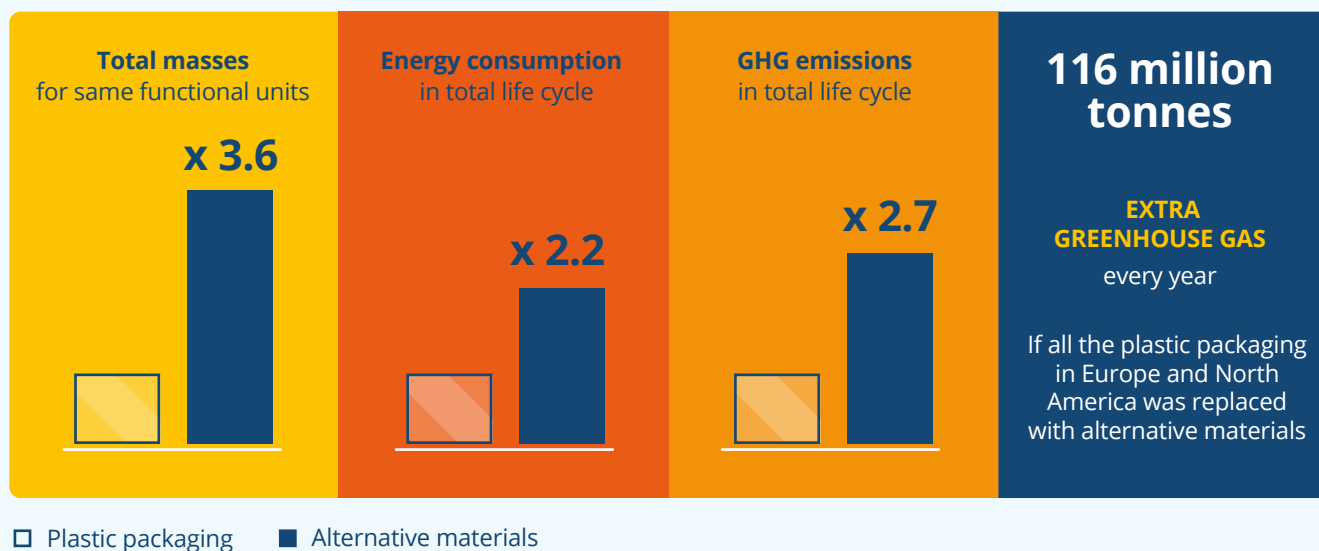
In 2018, 18 academics from 15 universities co-signed an open letter highlighting that switching away from plastics to alternative materials could worsen global warming.⁸

If we were to replace all the plastic packaging in Europe and North America with alternative materials, it could generate an extra 116 million tonnes of GHGs every year.⁹

Despite these findings, consumer research commissioned by the British Plastics Federation (BPF) found that only 2% of the public felt that plastic was the least damaging packaging material in terms of greenhouse gas (GHG) emissions.¹⁰

Plastic packaging also extends the shelf life of food and helps to reduce food waste, which is responsible for 8% of global GHG emissions.¹¹ 14% of food in the world is lost before it even reaches a retailer.¹²

One of the targets within the UN's Sustainable Development Goals is to reduce food loss within the production and initial supply chain, and to halve food waste among retailers and consumers.¹³ Plastic packaging is an essential component if these targets are to be met.



Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe (2011)

6. Green Alliance – Fixing the System (2020), Denkstatt (2011), Franklin Associates (2018)
7. Imperial College – Examining Material Evidence: The Carbon Fingerprint (2020)
8. The Sun – The war on plastic will backfire if it is 'taxed too highly' and could 'increase the spread of food-borne bugs', warn scientists (2018)

9. Denkstatt – *Plastics and Climate in Perspective* (2020)
10. See BPF press release: Industry Calls For Better Understanding of Plastics After Survey (2019)
11. The Food and Agriculture Organization of the United Nations – Food wastage footprint & Climate Change

12. The Food and Agriculture Organization of the United Nations – Food Loss Index
13. UN Sustainable Development Goals, Target 12.3

Is some plastic completely unrecyclable?

The technology exists to recycle all types of plastic. Some plastics are currently easier to recycle than others but recycling plants with technology capable of recycling the more challenging packaging designs are being developed all over the world. In the UK, there are nine plants either already constructed, at pilot phase or under construction.¹⁴

Packaging that is currently collected from households including bottles, pots, tubs and trays are widely recycled using 'mechanical' recycling.

Innovative technology involves purification techniques and what is commonly known as 'chemical recycling', which is an umbrella term for a number of different processes that convert plastic waste into base chemicals and chemical feedstocks.

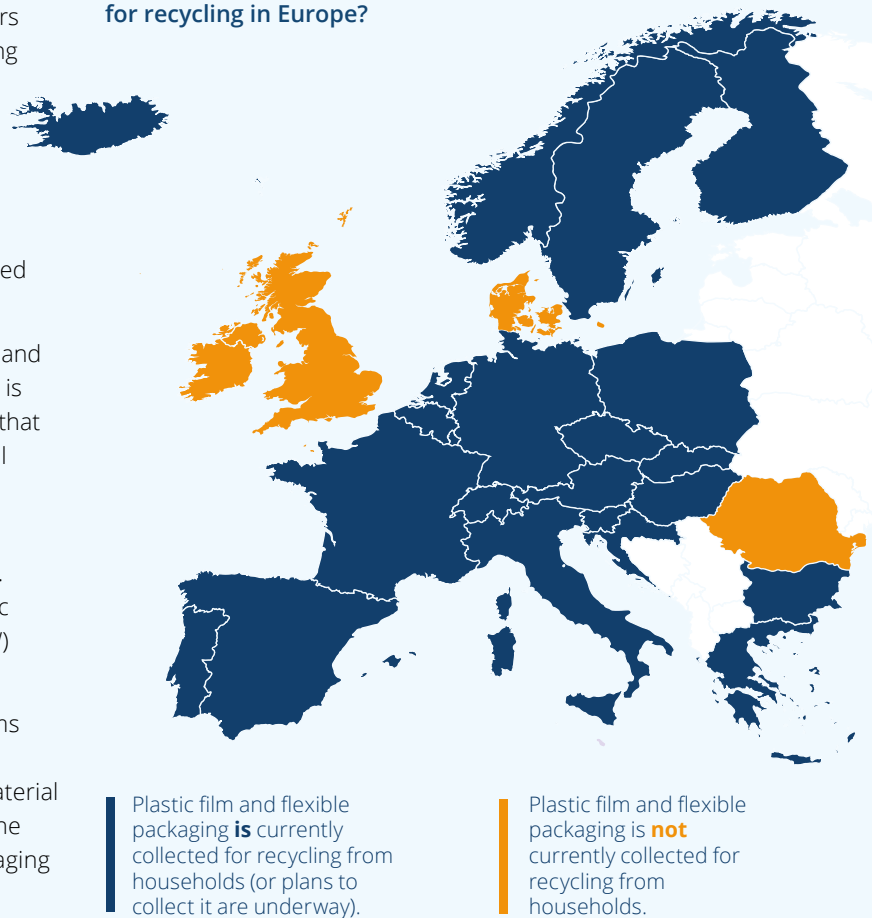
The growth of chemical (non-mechanical) recycling technologies can help reduce the UK's GHG emissions. Less 'virgin' material would be needed and more plastic waste would be diverted from energy from waste (EFW) facilities or landfill.

To increase the amount of plastic the UK recycles, films and flexible packaging also need to be collected from households and businesses.¹⁵ Once collected, this material will need sorting and reprocessing in order to meet the demand for recylate generated from the plastic packaging tax. End markets for this material exist in non-food applications and innovative technology such as chemical recycling enables more of this recycled material to be used in contact with food.

By using mechanical recycling to reprocess the majority of plastic and non-mechanical recycling as a complementary technology for the rest, most of the plastic the UK uses could be recycled within the country by 2030, with only 1% going to landfill, provided the right drivers are in place.¹⁶

To achieve this, there needs to be an increase in the amount of recycled material used in a wide range of products and better communication to consumers about what can be

FIGURE 1: Where is plastic film collected for recycling in Europe?



Source: Adapted from *Plastics Recyclers Europe - Flexible Films Market in Europe: State of Play (2020)*. In some countries marked blue, film collection is still not nationwide.

recycled. There also needs to be significant investment in expanding and improving the UK's recycling infrastructure (including non-mechanical recycling), as well as legislation ensuring plastic waste collection schemes are the same across all local authorities, including the collection of plastic film and flexible packaging, which is common in Europe.^{17,18}

14. BPF – *Recycling Roadmap* – Figure 43 (2021)
15. Plastics Europe – *Plastics the Facts 2020*
16. BPF – *Recycling Roadmap* (2021)

17. For a full list of changes required to improve the UK's recycling capacity, see BPF *Recycling Roadmap* (2021)

18. Plastics Recyclers Europe – *Flexible Films Market in Europe: State of Play (2020)*

Does only 9% of plastic get recycled?

This recycling statistic relates to all the plastic ever made – from before the technology to recycle plastic even existed.¹⁹ It is arguably also a bit misleading because lots of plastic plays a vital role in long-life applications. Some plastic pipes, for example, are designed to last for over 100 years, so a lot of plastic has not yet reached the end of its life.

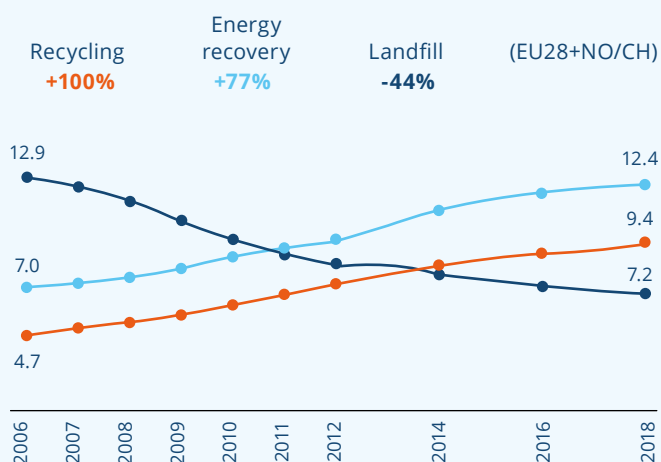
Instead of using a recycling statistic that refers to all the plastic ever made from every country in the world, regardless of whether or not it is still in use, a more accurate picture of the current situation can be gleaned by looking at recycling rates for individual countries. Even then, what qualifies as 'recycling' can differ from country to country, so direct comparisons are not always straight forward.

The average amount of plastic packaging recycled within the EU is 42%. In the UK, some key statistics are:

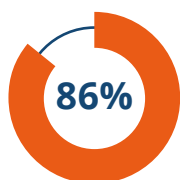
- 86% of plastic packaging is recovered (this means it is recycled or used to create EFW).²⁰
- 78% of all post-consumer plastic is recovered.²¹
- 77% of plastic drinks bottles are recycled.²²
- 50% of plastic packaging is recycled.²³

FIGURE 2: Within the EU, the amount of plastic sent for recycling has doubled since 2006.

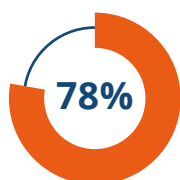
MILLION TONNES



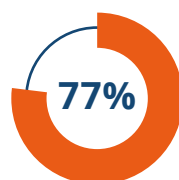
Source: Plastics the Facts 2020.



Plastic packaging is recovered (recycled or used to create EFW)



All post-consumer plastic is recovered



Plastic drinks bottles are recycled



Plastic packaging is recycled

19. Geyer – Production, Use, and Fate of all Plastics Ever Made (2017)

20. Environment Agency – National Packaging Waste Database (accessed Nov 2020)

21. Plastics Europe – Plastics the Facts 2020

22. Valpak – Databite No. 3

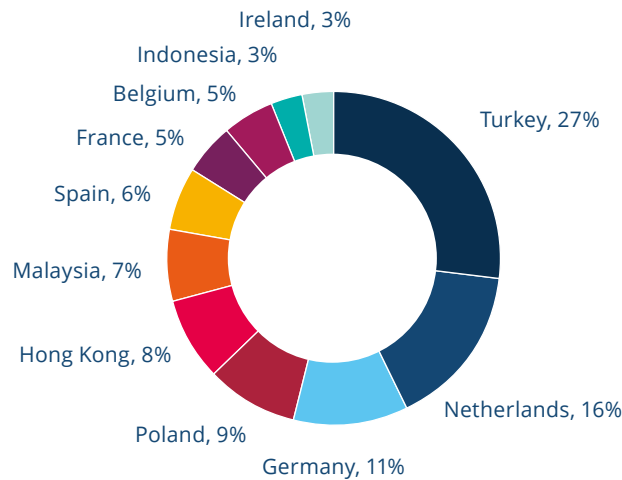
23. Environment Agency – National Packaging Waste Database

Throughout the EU there has been a steady increase in recycling rates for plastics. Since 2006, the amount of plastic sent for recycling has doubled, whilst material going to landfill has decreased by 44%.²⁴ When it comes to the UK, the recycling of post-consumer plastic has increased by 140% since 2006 and the amount of plastic being sent to landfill has reduced by two-thirds.²⁵

61% of the plastic packaging collected in the UK is exported for recycling due to insufficient capacity to recycle it here.²⁶ If you would like to understand why plastic waste is currently exported for recycling, this document contains a section later on called *Exporting plastic waste for recycling*.

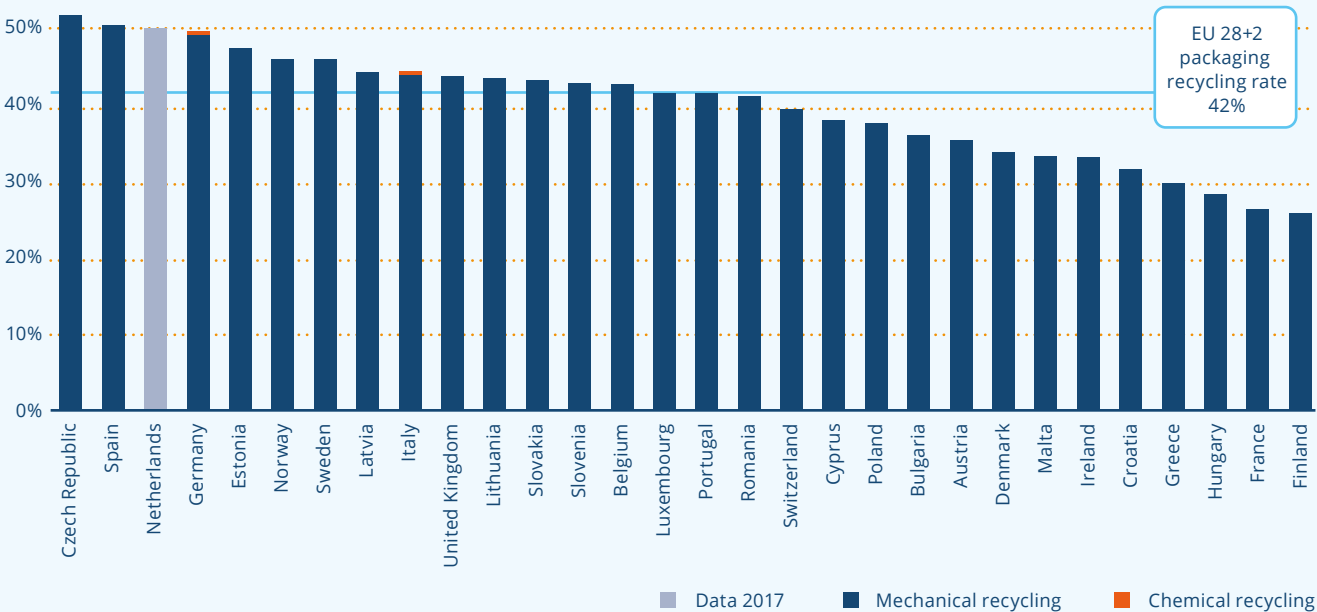
The UK plastics industry would like to process far more plastic within the UK, reducing our reliance on exporting plastic waste and minimizing plastic going into landfill. It has shown how this can be achieved by 2030 in the BPF's *Recycling Roadmap*, which highlights the changes and drivers needed to more than triple the amount of plastic reprocessed in the UK, more than halve exports of plastic waste and reduce the amount of plastic going to landfill to 1%.

FIGURE 3: UK plastic waste exports



Source: National Packaging Waste Database– 360 Env. Feb 2020

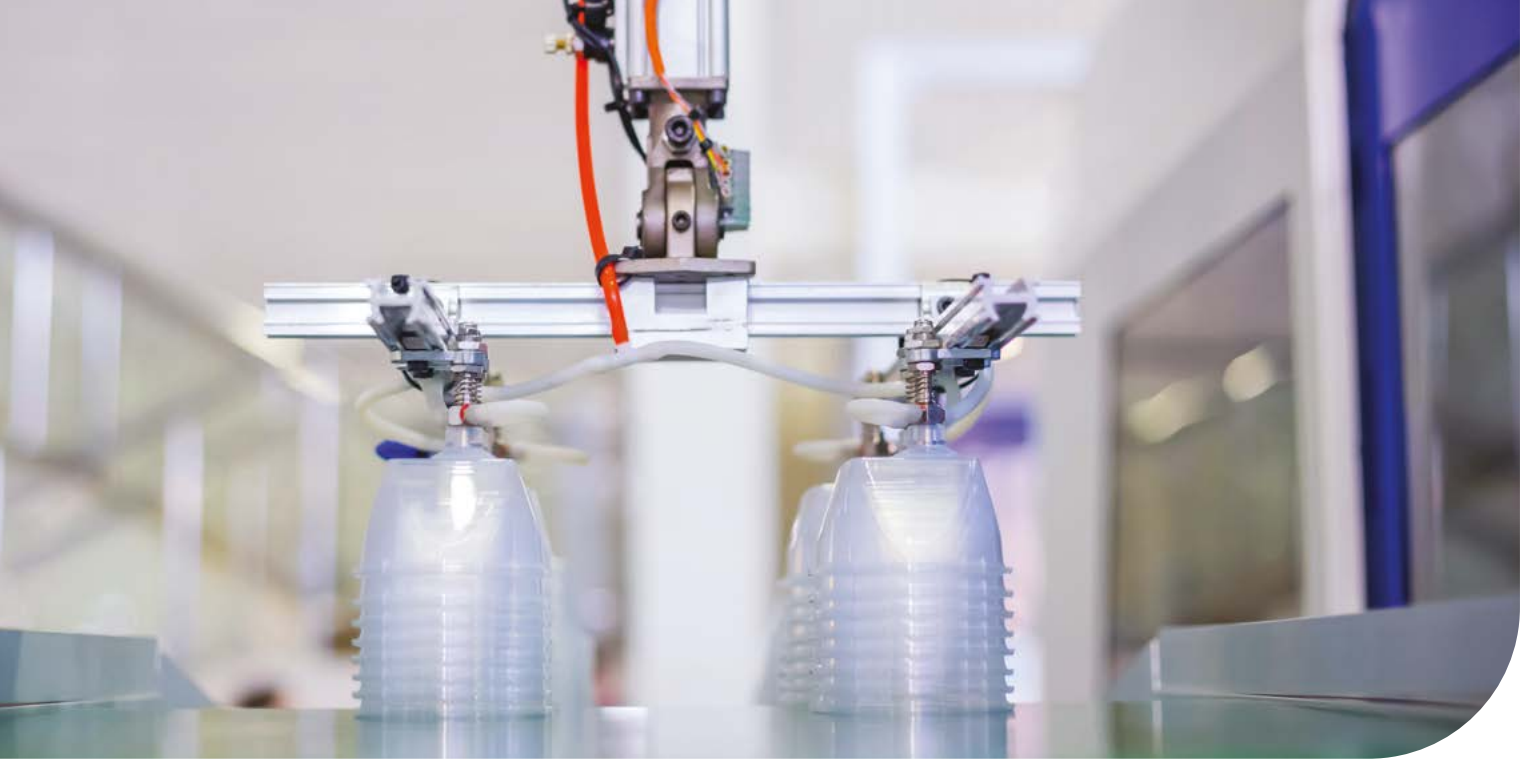
FIGURE 4: Plastic packaging recycling rate per country in 2018



24. Plastics Europe – Plastic the Facts 2020

25. Plastics Europe/Conversio data published in BPF Recycling Roadmap (2021)

26. Using data from National Waste Packaging Database and Valpak 2020 PackFlow Covid-19 report



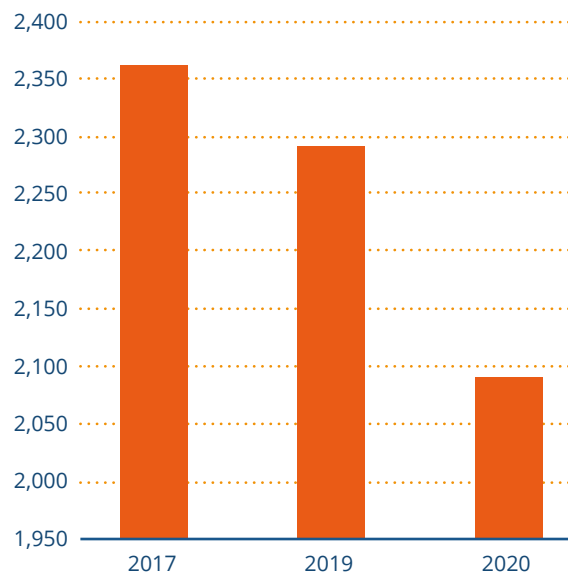
Is the amount of plastic packaging we use massively increasing?

The amount of plastic packaging in the UK waste stream has been decreasing for a number of years, reducing from 2080 kilotonnes in 2006 to 2018 kilotonnes by 2020. If you take the overall amount of plastic packaging waste produced and divide it by the population, that equates to a 13% reduction in the amount of plastic waste per person.²⁷

In 2020, the coronavirus had a huge impact on overall packaging consumption, creating a somewhat complex picture. Put simply, demand for some packaging increased while in other areas it plummeted. Demand in the hospitality, building and certain manufacturing sectors was severely diminished for an extended period of time, for example.

During periods in which people work from home or are discouraged from leaving their homes, they are likely to use slightly more packaging at home than they did previously. But the huge drop in demand from other sectors, coupled with innovations that reduce the amount of material a packaging product requires, means that the amount of plastic packaging placed on the market in 2020 actually decreased according to industry projections (see chart).²⁸

FIGURE 5: Plastic packaging projected placed on the market (tonnes)



Source: Valpak PackFlow Covid-19 Phase II, 2020

27,28. Valpak – Packflow Covid-19 Phase II, 2020

Is it better to buy goods with no packaging?

Packaging prevents food waste in several ways. It extends shelf life, protects from damage or contamination and can assist with portion control, as well as displaying information about the correct way to store, prepare and serve a product.

Plastic packaging ensures a high level of hygiene. It can provide a barrier against air or moisture and can help to optimize humidity. With good puncture resistance and sealing, it can also provide a modified, protective atmosphere or a vacuum, and can even remove oxygen emitted by the product to further increase shelf life.²⁹ There are times when reusable and refillable packaging can play a useful role in helping us to enjoy products. This can be for products consumed out of the home as well as in the home. However, when deciding upon which type of packaging is most suitable, it is important to consider the overall environmental impact, including end of life implications.

Plastic packaging

- Extends shelf life
- Protects from damage or contamination
- Can assist with portion control
- Displays information about the correct way to store, prepare and serve
- Provides a puncture-resistant barrier against air or moisture
- Can optimize humidity levels
- Can provide a modified, protective atmosphere
- Can contain anti-microbial properties

29. *Structure and Function of Food Engineering*, Chapter 2 - Oxygen Scavengers: An Approach on Food Preservation (2012)



It is very rare that a product only travels between a shop and your home. Most of what we buy involves long supply chains and many products travel hundreds or even thousands of miles before they reach your fridge. Even food products intended to be sold 'loose' in a shop need to be protected on this journey, so some form of packaging is necessary.

The environmental impact of growing or manufacturing the products we buy is usually far higher than the packaging protecting it. A typical steak, for example, produces 7.5kg

of CO₂ on its journey from farm to fork.³⁰ The packaging protecting it produces 80g and extends its shelf life by ten days.³¹

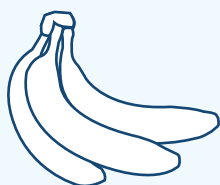
In the UK, more than a fifth of the food we buy is wasted after it leaves the farm – and 71% of wasted food comes from households.³² Our country wastes £19bn of food every year, which is responsible for over 25 million tonnes of greenhouse gas (GHG) emissions.³³

Food waste prevention

Bananas in a flexible bag extend their **shelf-life** by



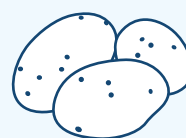
3
DAYS



Plastic bags **reduce waste** of potatoes by



2/3



Cucumbers **extend their life** when wrapped in film by



14
DAYS



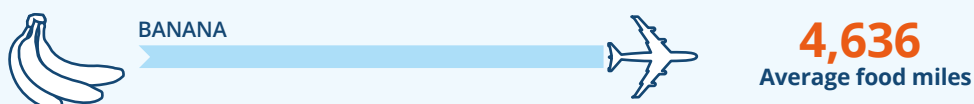
Advance plastic packaging **extends the life** of steak up to



10
DAYS



Average food miles



Source: Figures are global averages taken from foodmiles.com and accurate as of 19 April 2021

30. Lesschen et al – Greenhouse gas emission profiles of European livestock sectors (2011)

31. Denkstatt – How Packaging Contributes to Food Waste Prevention (2017)

32, 33. WRAP – Food surplus and waste in the UK – key facts (2020 update)

Plastic packaging protects and preserves perishable items like food, vastly reducing the risk of damage and contamination, using a very small amount of material. If you compare cheese sold at a counter to pre-packed cheese bought off the shelf, the amount of cheese wasted can reduce from 5% to 0.1%, for example. Research has also shown that 11% of plaited yeast buns sold in a paper bag are wasted, compared to 0.8% of those sold in plastic film.³⁴

The benefits of preventing food waste usually far outweigh the environmental impact of the packaging. The packaging for one kilogram of food on average creates 70 grams of CO₂ but prevents 350 grams of CO₂ due to food waste.³⁵

By protecting food products on their – sometimes very long – journey to our plate and extending their shelf life, plastic packaging plays a key role in reducing the amount of food that gets wasted and therefore reduces needlessly generated GHGs. And using plastic to make packaging, rather than alternative materials, generates less GHGs and uses less energy.³⁶

FIGURE 7: Denkstatt – How packaging contributes to food waste prevention (2017)

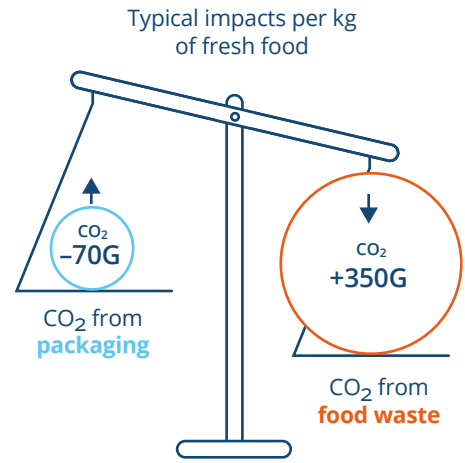
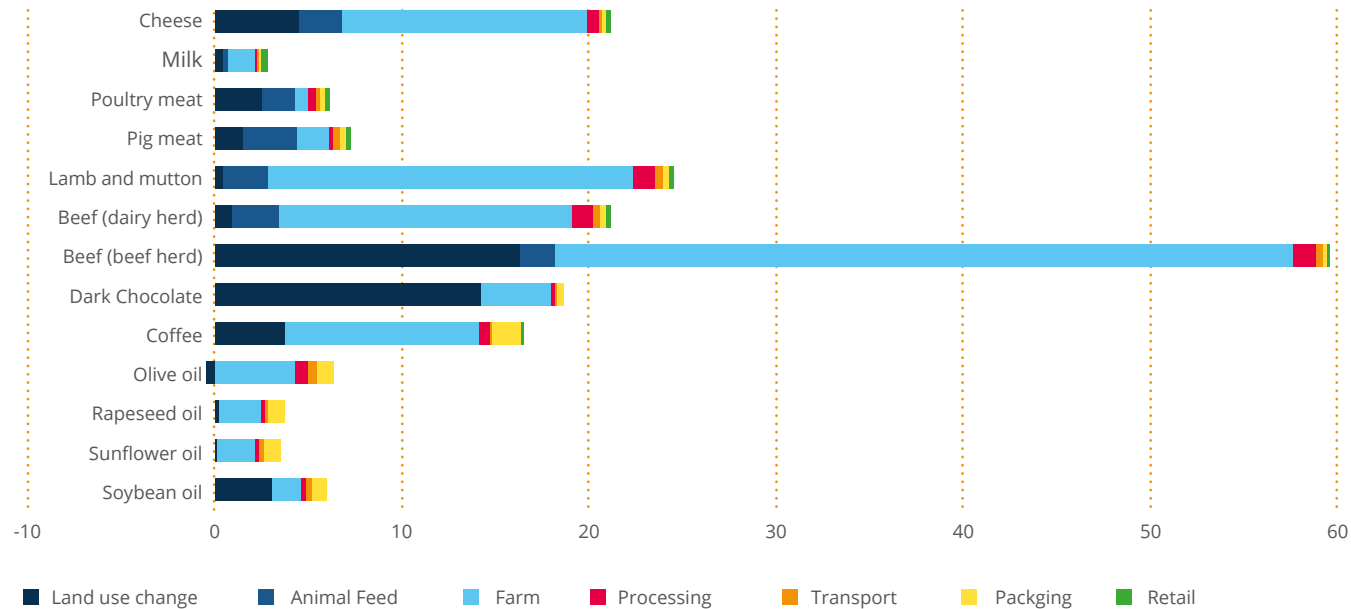


FIGURE 6: GHG impacts of food production and packaging



Source: Adapted from Poore, J., & Nemecek, T., Reducing food's environmental impacts through producers and consumers, 2018, Science

34. Denkstatt – How Packaging Contributes to Food Waste Prevention (2017)

35. Denkstatt – How Packaging Contributes to Food Waste Prevention (2017)

36. Denkstatt – Plastics and Climate in Perspective (2020)

Will there be more plastic in the ocean than fish by 2050?

Mismanaged plastic waste entering rivers and seas is a hugely important global issue that needs to be addressed but plastic will continue to play an important role in many industries because it is a unique, lightweight and resource-efficient material. Switching to alternative packaging materials, for example, could more than double energy use and almost triple GHG emissions.³⁷ This means other materials may cause more pollution and increase global warming, so there are no easy solutions to the problem of marine litter.

But society’s relationship with plastic needs to evolve as we learn to manage plastic waste far more efficiently, recycle more of it and minimize the risk of it ending up in the ocean.

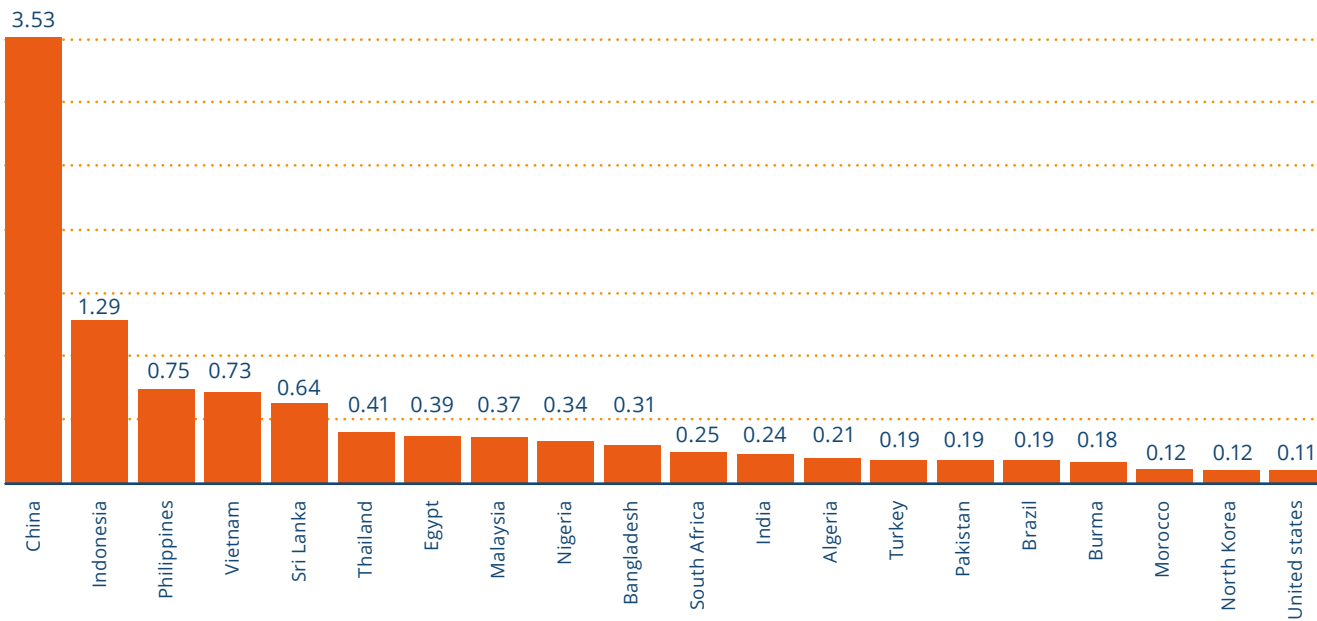
Most plastic enters the sea from Asia, generally from countries that do not have an adequate waste collection and recycling

infrastructure. 60% of plastic waste in the ocean can be sourced to five countries in southeast Asia.³⁸ The shores of the USA, UK and the whole of Europe combined account for just 2% of plastic entering the sea.³⁹

Although the UK does export waste for recycling, the BPF has been encouraging the government and other stakeholders to ensure there are better controls in place so that no waste exported for recycling escapes into the environment. For many years, the BPF has called for the UK to reduce its reliance on exporting plastic waste and the BPF’s *Recycling Roadmap* has shown how, with the right drivers and investment, the UK can more than halve exports of plastic waste by 2030 and eliminate the export of low quality material.

FIGURE 8: Plastic debris entering world oceans (est)

Million metric tonnes per year



Source: Plastic waste inputs from land into the ocean (2015)

37. Imperial College – *Examining Material Evidence: The Carbon Fingerprint* (2020)

38. Ocean Conservancy and the McKinsey Center for Business – *Stemming the Tide: Land-based strategies for a plastic-free ocean* (2015)

39. Jambeck et al – *Plastic waste inputs from land into the ocean* (2015)

Global industry-funded initiatives addressing the issue of marine litter

Global Plastics Alliance (GPA)
FORMED IN 2011

80 plastics industry and allied industry associations

395 projects in 43 countries were launched, planned or completed.

By early 2020

Alliance to End Plastic Waste (AEPW)
LAUNCHED IN 2019

80 companies, project partners, allies and supporters

AEPW aims to invest

\$1.5 billion

Before 2025

Developing scalable solutions to prevent plastic waste ending up in the environment and improve the lives of millions of people

Plastic waste that is exported must be sent to facilities that are capable of processing it in an environmentally sound manner and there needs to be adequate checks in place to ensure this happens.

In addition to major investment in improving the UK's domestic recycling capacity, appropriate funding needs to be directed towards developing nations that are not currently capable of collecting and recycling plastic waste. This requires the relevant governments to establish circular economy objectives alongside appropriate extended producer responsibility obligations to raise and direct the required funds.

There are, however, many industry-funded initiatives across the globe to help address the issue of marine litter. For example, over 80 companies, project partners, allies and supporters are part of the Alliance to End Plastic Waste (AEPW), which was launched in 2019. AEPW aims to invest \$1.5 billion before 2025 in developing scalable solutions to prevent plastic waste ending up in the environment and improve the lives of millions of people.

In addition, the Global Plastics Alliance (GPA) was formed in 2011. This is a collaboration involving 80 plastics industry associations and allied industry

Although the claim there will be more plastic than fish in the sea by 2050 is almost definitely wrong, it did make an important point: [globally] far too much mismanaged plastic waste is ending up in the ocean and this needs to stop.

associations. By early 2020, 395 projects in 43 countries were launched, planned or completed.

A lot of work is ongoing and more needs to be done to address the global issue of mismanaged plastic waste entering the environment. But when it comes to there being more plastic than fish in the sea by 2050, this claim is based on questionable projections about plastic waste extrapolated from San Francisco and questionable estimates of fish numbers that were based on looking at phytoplankton from space. The BBC examined the claim in detail in 2016.⁴⁰

Although the claim there will be more plastic than fish in the sea by 2050 is almost definitely wrong, it did make an important point: far too much mismanaged plastic waste is ending up in the ocean and this needs to stop.

40. BBC News – Will there be more fish or plastic in the sea in 2050? (2016)

