Appendix C

Plastic Packaging and the Environment

British Plastics Federation 2018 /wEPDwUKMTUv

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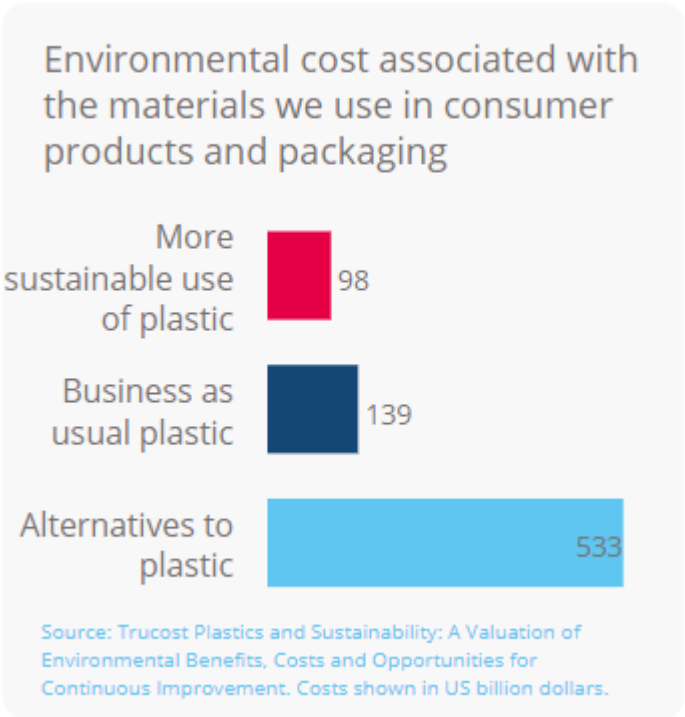
Is plastic packaging bad for the environment?

No. Many people don't realise that plastic packaging provides many environmental benefits.
Studies have also shown that if there was no plastics packaging available and other materials were used, the overall packaging consumption of packaging mass, energy and greenhouse gas (GHG) emissions would increase.

Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz

Plastic packaging is also lightweight and strong — this means we use fewer vehicles and less fuel to transport it. Plastic packaging makes a positive contribution to saving resources and reducing emissions. Other "single-use" items, such as plastic packaging of fruit and vegetables, provide hygienic ways to purchase food and reduce waste, which reduces overall resource consumption. Grapes sold in sealed trays rather than loose bunches typically have reduced waste in stores by over 20%. Plastic packaging has also brought important innovations to keep food fresh and reduce wastage in the home.



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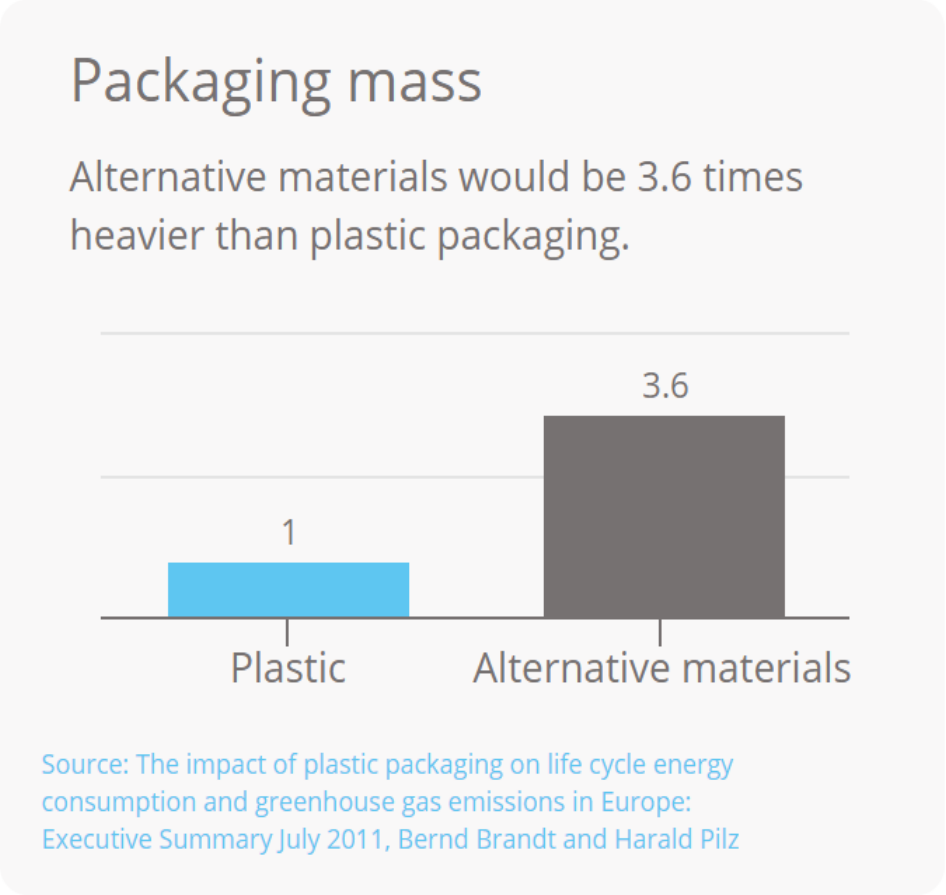
Do we need single-use packaging?

Firstly, there is no such thing as single use packaging all plastic packaging can be recovered for recycling or the generation of energy.
"Single-use" plastic packaging has an important part to play in modern life, especially where safety and hygiene is concerned. For example, a plastic water bottle allows hygienic access to clean drinking water and is less resource intensive to produce than alternative materials. It's easy to forget this as plastic packaging does such a good job protecting
us from harmful germs. For example, the Food Standards Agency recently explained that raw chicken, must be placed in a plastic bag separately to other food to prevent food poisoning.



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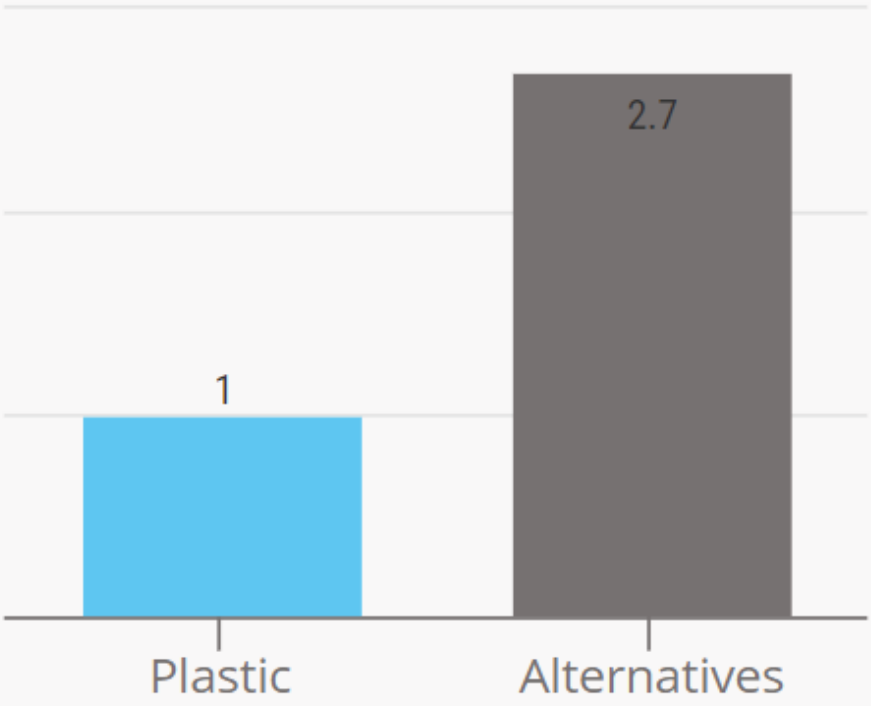
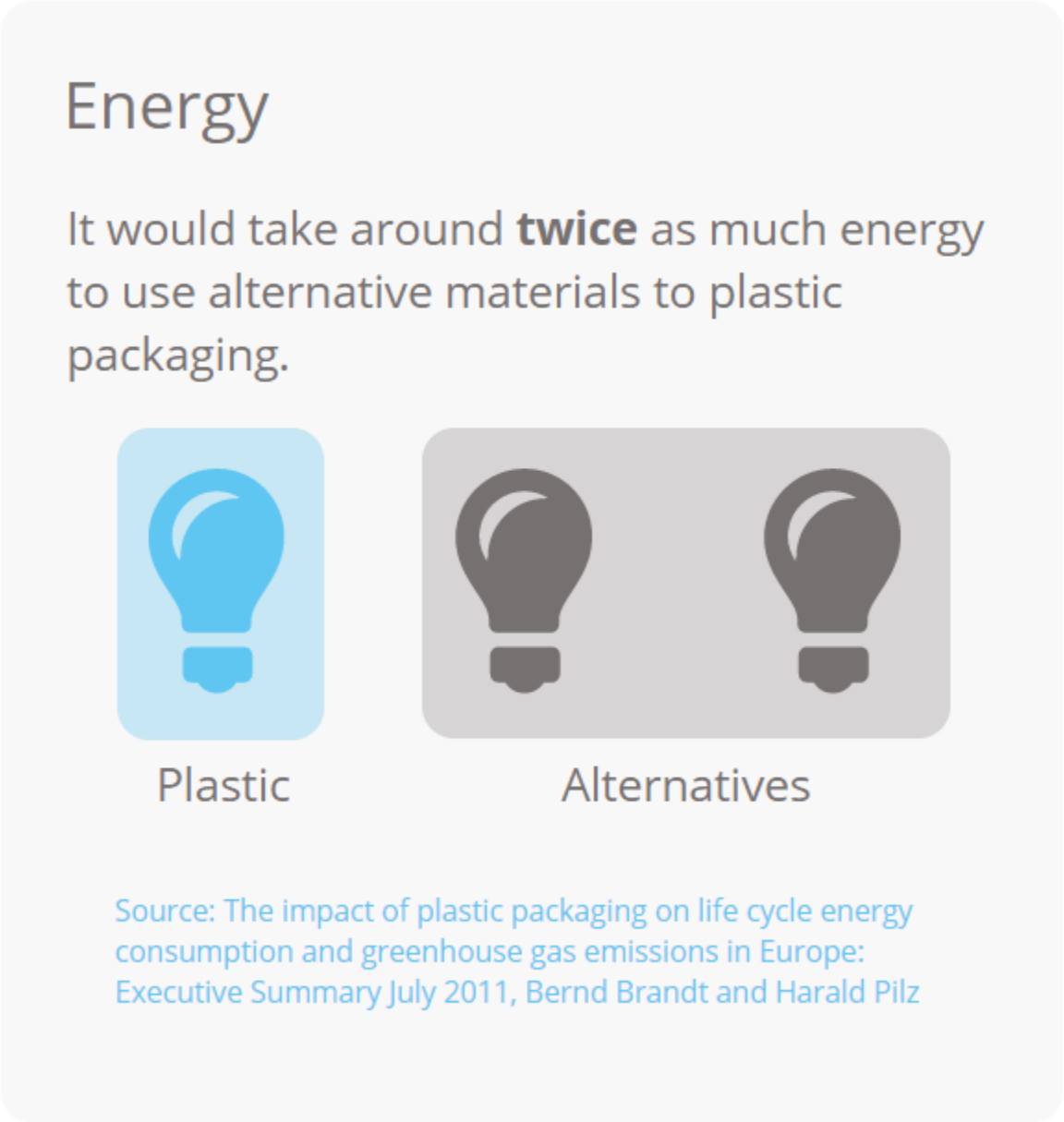
"Single-use" plastic packaging has also considerably reduced packaging weight in transit and in many cases, has reduced the number of lorries needed to transport goods on our roads. Without "single use" plastic packaging food waste would increase, more energy would be used and more carbon emissions would result.

Greenhouse Gas Emissions

Alternative materials to plastic would result in 2.7 times more greenhouse gases emissions over their life time.



Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz



Does the production of plastic packaging use a lot of energy?

Plastic packaging production uses about half as much energy as alternative materials. Plastics are also a very lightweight packaging medium, which means less energy is used to transport goods protected by plastic packaging.

Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz

The plastics industry is committed to using even less energy and reducing carbon dioxide emissions. Many producers sign up to a voluntary Climate Change Agreement with the Environment Agency. The plastics and thin film industry comfortably achieved the target reduction set for the first monitoring period of January 2013 – December 2014. Some individual organisations have achieved an energy usage reduction of up to 50%.

Is plastic packaging resource efficient?

The UK government's guidance on waste management sets out the waste hierarchy. The hierarchy indicates the preferred method of waste management, beginning with the most desired option: prevention. The plastics industry is constantly innovating and improving production and waste management to promote the waste hierarchy's objectives.

Prevention: plastic packaging is lighter than it used to be — this means less raw materials are used. The industry also engages in an agreement to work towards reducing packaging and waste called the Courtauld Commitment.

Examples of lightweight packaging innovations:

- The Fez — Child resistant closure with 40% weight reduction.
- Super Lightweight Mono Material Trays — strong environmental credentials with excellent levels of performance and functionality.
- Infini Bottle — a lightweight, fit-forpurpose milk bottle with a reduced carbon footprint.
- Multilayer Polypropylene Jars — light, easy-to-open, resealable and recyclable food containers.

Preparing for re-use: Many types of plastics packaging are long-life artefacts. For example, returnable crates have lifespans of over 25 years and re-usable bags are playing a greater role in responsible retailing.

Recycling: Plastic recycling is always improving. Plastic packaging can have a new lease of life in building and construction or as furniture, a bag or footwear. View examples.

To read more about recycling visit the BPF Recycling Group.

Other recovery: At the end of its life plastic packaging can be submitted to energy-fromwaste schemes. Plastics are an effective energy source because they have a high calorific value.

Disposal: No plastics should be put in landfill. Currently 26% of all plastic in the UK still goes to landfill.

Where does plastic in the ocean come from?

The majority of litter in the seas and oceans comes from outside of Europe, so it's vitally important that other countries also take action. Marine litter — like litter in our cities and towns — is largely due to the thoughtless disposal of waste on land. Tackling this issue requires us to focus on changing the way people discard items in our communities.

Litter travels

80% of the plastics found in the ocean is estimated to have come from land-based sources.

Source: European Commission. Our Oceans, Seas and Coasts

Sources of plastic in the ocean

It is generally accepted that largest source of leakage of plastic items into the oceans is from a small number of Asian and Pacific rim countries that account for over 80% of ocean waste - these include China, Indonesia, Philippines, Vietnam, Sri Lanka, Thailand, Egypt, Malaysia, Nigeria and Bangladesh.

Source: Jambeck et al. ‘Plastic waste inputs from land into the ocean’. Science
98% of the litter in our oceans emanates from countries outside Europe and the United States.
Source: Ellen MacArthur Foundation, The New Plastics Economy: Rethinking the future of plastics
Reasons for leakage
The UN estimates that ‘at least 2 billion people worldwide still lack access to solid waste collection’. As these people are left to rely on dumpsites, which are often located near oceans or waterways, it is understandable how this leakage occurs.
Source: UNEP, Global Waste Management Outlook, 2015
Learn more about plastic in the ocean.

How can I prevent plastic entering the ocean?

As litter travels to water ways, it's essential we:

- Use the bin - not the gutter, not the river, not the pavement.
- If you see some litter and you’re near a bin – pick it up.
- If the bin is full, find another one or take your litter home.

You can also join a local beach or neighbourhood clean up.
Learn more about plastic in the ocean.

What is the industry doing about plastic in the environment?

The plastics industry is very active in helping to understand and reduce litter. We work with a variety of non-governmental organisations (NGOs) and charities to educate and hange behaviour. These initiatives need to be complimented by government enforcement of anti-litter legislation.

For Fish's Sake #FFSLDN

To prevent litter entering our marine environment, the BPF has supported another innovative behaviour change campaign from Hubbub. For Fish's Sake launched in May 2017 and focuses on the Thames River, London. The campaign aims to help people understand the connection between littering on the land and pollution in our waterways in a playful creative way. It also works to build a sense of community around the Thames and reduce the desire to litter. For Fish's Sake's interventions include ballot rubbish bins, grate art and a cabinet of curiosities. The aim is to create a replicable model for other waterways and expand nationally.

#NeatStreets
#NeatStreets is an anti-littering campaign supported by the plastics industry which took place in Villiers Street, London. The project used innovative methods of behaviour change to challenge and change littering behaviour. Run by Hubbub, #NeatStreets drew on developing a sense of community and using targeted, evidence-based infrastructure such as interactive bins and cigarette ballot bins.
The cigarette ballot bin was designed specifically with engaging questions and two receptacles labelled with different answers to allow smokers to 'vote with their butt'. These customisable bins have been replicated internationally and proven to cut cigarette litter by up to 46%.

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Hubbub is now running workshops to teach local authorities how to deliver creative and impactful anti-litter campaigns. 100% of attendees have registered interest in running #NeatStreets locally.

Bincentives

The BPF and PlasticsEurope worked with the Marine Conservation Society in the 2017 academic year on a project called CSI: Litter Challenge. As part of this schools developed their own litter campaign. The winning school's idea has now inspired a new litter campaign called Bincentives. Bincentives provides a series of posters which use emojis to deliver anti-littering messages to the students. Students using litter and recycling bins are rewarded for their behaviour.
To find out more and download the posters please click here.

Litter Strategy for England

The BPF was an enthusiastic contributor to the first ever Litter Strategy for England. The Department for Environment Food & Rural Affairs (DEFRA) Strategy recognises the importance of behaviour change, education and infrastructure and enforcement. It also proposes setting up several working groups to take the issue forward.

Operation Clean Sweep®

Primary microplastics are thought to account for less than 10% of plastic in the ocean, this includes tyres, road markings, building paints, and fibres from clothes.
Source: Eunomia. Plastics in the Marine Environment. June 2016.
Although pellet loss only represents less than 1% of the primary microplastic in the environment, the BPF runs this industry-led initiative to reduce plastic pellet loss.
Source: Boucher J and Froit D (2017) Primary microplastics in the Oceans. A Global Evaluation of Sources. Gland, Switzerland: IUCN 43pp

The implementation manual helps companies to audit their sites, set up their worksite, train staff, and create procedures to ensure their factories are free of rogue pellets and that the risk of them escaping into the wider environment is minimised. The UK was an early adopter of this international programme.

Operation Clean Sweep®

www.operationcleansweep.co.uk

Marine Litter Action Network

The BPF and the Marine Conservation Society (MCS) created the Marine Litter Action Network (MLAN), which the industry helped to fund. MLAN brings together people from a variety of organisations (NGOs, academics, decision makers) to take coordinated action on marine litter. MLAN also includes an educational initiative that teaches young people about the ocean and the importance of looking after our environment.

Although the plastics industry is working hard to tackle litter in the UK, the majority of litter finding its way into the seas and oceans around the UK comes from elsewhere, so it is vitally important action is taken by the other counties as well.

Learn more about plastic in the ocean.

What should we do about plastic in the ocean?

Any solutions taken must be carefully considered to make sure they address the root cause of the issue and are well suited to preventing plastic ending up in the environment. As most of the plastic in the ocean comes from the land, it is essential that we prevent litter on the land. This includes behaviour change initiatives and improving waste management in developing countries.

Moving away from plastic to alternative materials will not solve the problem of rubbish in our natural environment. In fact, one study has found that moving to alternatives to plastic could actually be worse.

Source: Trucost Plastics and Sustainability: A Valuation of Environmental Benefits, Costs and Opportunities for Continuous Improvement

Learn more about plastic in the ocean.

Would a plastic-free aisle in the UK help reduce plastic in the ocean?

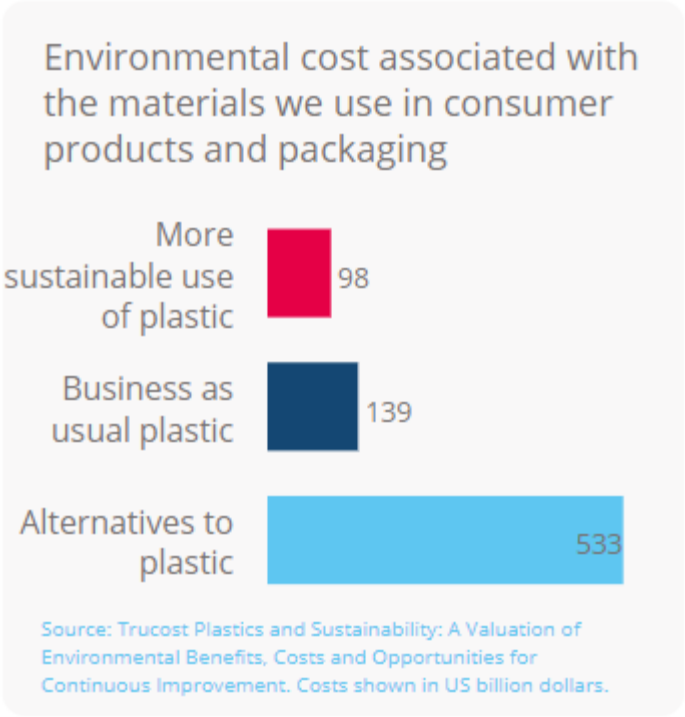
As most (98%) of the plastic that enters the ocean comes from sources outside the UK and the United States (Source: Ellen MacArthur Foundation, The New Plastics Economy: Rethinking the future of plastics), a plastic-free aisle in the UK will not contribute in any material way to problem of plastics in our oceans.

The most important step is to improve the waste management facilities across the world, as over 2 billion people rely on dumpsites near waterways (Source: UNEP, Global Waste Management Outlook, 2015), this could have a large impact on protecting our oceans.

It is important to realise that as long as it is disposed of correctly, plastic packaging is the greener option — it uses less energy to produce, reduces transport costs and CO2 emissions because it is lightweight, and significantly reduces the amount of fresh food wasted by protecting it in a hygienic environment and extending its shelf life. A ‘plastic-free aisle’ would potentially increase the overall environmental impact of food packaging by increasing food waste, increasing the resources necessary to package goods and increasing greenhouse gas emissions.

The UN's recent Ocean Conference, 2017 recognised the importance of addressing marine pollution as a socioeconomic issue, requiring the encouragement of reuse and recycling, the development of converting plastic to energy and behaviour change interventions. It also noted the importance of capacity building in developing states around waste management infrastructure.

Source: The Ocean Conference, New York, 5-9 June 2017. Concept Paper on Partnership dialogue 1: Addressing marine pollution.



Learn more about plastic in the ocean.

What should we do about litter?

When addressing litter, it is essential to remember that litter is the consequence of thoughtless and careless behaviour and involves a vast array of items. Successful solutions will use a combination of evidence-based strategies to target changing human behaviour and the government enforcement of litter-related offences. See the section above for a variety of effective industry the plastics industry is supporting.

Would a Deposit Return Scheme help prevent litter?

We can't find any robust evidence that shows a DRS has had a positive impact on litter. In the UK, beverage containers are a small percentage of litter: plastic bottles only account for 2.1% of litter, cans 3.5%.

Source: Litter Composition Survey of England carried out by Keep Britain Tidy (KBT)

One recent German study found that there were 'no significant quantitative effects in litter reduction and no economic effect in street cleaning identifiable as a result' of the DRS.

Source: Effects of deposits on beverage packaging in GermanyEffects of deposits on beverage packaging in Germany. Prognos Executive Summary.

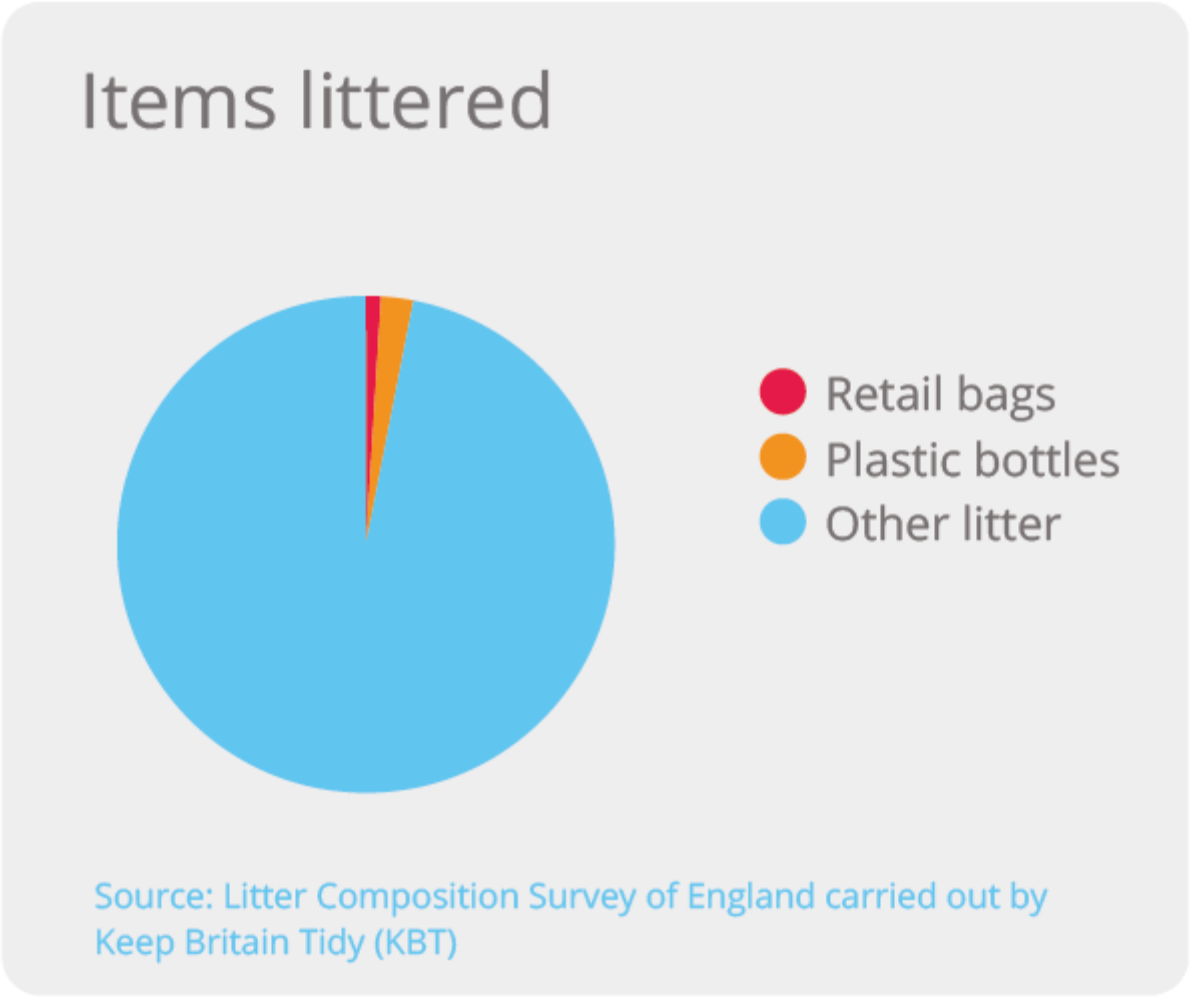
Litter surveys from Australia also indicate that Victoria, a state that employed behaviour change methodologies instead of a DRS, has seen the strongest decline in the number of littered items. Despite having a DRS since 1977, South Australia does not have the lowest amount of litter and since the introduction of a DRS in the Northern Territory in 2012, littered items have actually increased.

Source: Keep Australia Beautiful, National Litter Index 2014/2015.

Do certain items get littered more than others?

Litter is a behavioural issue, but sometimes packaging can encourage or discourage littering. For example research by Coca Cola has found that bottles are less likely to be littered than cans – this is thought to be due to the fact they can be resealed and carried to another location to dispose of them responsibly if there are no bins nearby.

Litter surveys have found that cigarettes and chewing gum are the most frequently littered items. Plastic bottles and retail bags were only a small percentage of the items littered (2.1% and 0.7% respectively).



Can I get in trouble for littering?

Yes. It is an offence to drop litter in the UK and in many other countries. Dropping litter in the UK can attract a large financial penalty.

Would more bins help?

Probably. We know that if bins aren't easily available, people do tend to drop rubbish. In a recent observation of Londoners, people were over twice as likely to use a bin if it was within five metres (Source: Hubbub observations as part of For Fish's Sake). Previous observations by Disney found that people would drop litter if they did not find a bin within 30 steps.

However, it's also important that we create a culture of using the bins and making it unacceptable for people to throw rubbish on the ground. In addition, there is a question of how we make sure the bins we have are doing the right job. Are they visible? Are they overflowing? Some councils are experimenting now with solar powered sensors that send notifications when they are getting full (DEFRA Litter Strategy).

39% of Londoners admit to dropping litter when they are on their own*

*Survey was conducted by Censuswide on behalf of Hubbub in April 2017 and interviewed 1,000 Londoners.

Does biodegradable packaging reduce litter?

It's unlikely. Current biodegradable materials require specific circumstances, such as very high temperatures which are not met on our streets or in the oceans. In relation to marine litter, the UN's chief scientist, Jacqueline McGlade said that these materials are 'well-intentioned but wrong'.
Source: The Guardian, Biodegradable plastic: false solution for ocean waste.
The UN also cautioned that using these materials may actually increase littering, as consumers would assume that because these materials would break down overtime it was acceptable to litter them.

Source: UNEP (2015) Biodegradable Plastics and Marine Litter. Misconceptions, concerns and impacts on marine environments. United Nations Environment Programme (UNEP), Nairobi.
There are applications where biodegradable compostable products can offer positive benefits to waste management. Some of these uses could be for some items in households where home composting facilities are available, food waste (for industrial composting or anaerobic digestion) and products that have a high food contamination level making them difficult to recycle.

Why don't we use more compostable or biodegradable material?

Good environmental practice requires us to use the least material to do the job required, then to reuse or recycle by recovering material or energy from the products we use at the end of their life. For that reason, most plastic packaging is either recycled or sent to energy-from-waste plants (if recovery for recycling is not the best environmental option).
Where products are not presently collected for recycling it can be because there are high levels of contamination and/or the resources required to recycle simply makes it unsustainable at present. Most presently available compostable and biodegradable materials fail to recover material or energy. Currently, no materials have been proven to adequately biodegrade in the open marine environment.
When packaging can't be easily recovered (because there is a high level of food contamination) and the process of waste management is compatible with compostable material, then compostable materials would be appropriate for returning the nutrients contained in the food.
However, if compostable or biodegradable materials get into the recycling stream, this can have detrimental effects, rendering the recyclate unusable. For this reason, where compostable material is used, it is important that this risk is recognised and managed.

Did you know? Biodegradable material is different to bio-based material. Plants can also be used to make non-biodegradable plastic.

Source: UNEP (2015) Biodegradable Plastics and Marine Litter. Misconceptions, concerns and impacts on marine environments. United Nations Environment Programme (UNEP), Nairobi.s