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ROCK Sustainable Event Guidance

Factsheet 2: Understanding and eliminating problem plastics

Developed by Julie's Bicycle, as part of the 'ROCK Sustainable Events' series.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730280.

Call: H2020-SC5-2016-2017

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DISCLAIMER

ABOUT ROCK

Introduction to ROCK:

ROCK aims to support the transformation of historic city centres afflicted by physical decay, social conflicts and poor life quality into Creative and Sustainable Districts through shared generation of new sustainable environmental, social, economic processes. ROCK develops and applies an innovative circular systematic approach to connect different actors, places of cultural heritage value and systems, at a European level as well as at a local level, facilitating the innovation process and the adoption of environmentally and socially sound solutions to achieve sustainable growth.

Cultural heritage at risk:

In 2014, the International Union for the Conservation of Nature's IUCN World Heritage Outlook declared climate change to be the most serious potential threat to natural World Heritage sites worldwide. The effects of climate change – from sea-level rise and higher temperatures to increasingly frequent extreme weather events such as floods and droughts – all threaten to rapidly degrade the natural and cultural heritage of humankind.

There is an urgent need for environmental support and resources to encourage cultural heritage leaders and practitioners to take action on climate change and the environment in order to safeguard cultural heritage and protect wider society from the effects of environmental breakdown. The safe-guarding of cultural heritage not only aims to protect heritage (including crucial habitats and biodiversity) – but also heritage as a driver for new and greener products, services, skills, and finance that can enhance the economic, social and cultural value which cultural heritage brings.

SCOPE

Introduction to the ROCK 'Sustainable Event' series

These guides will equip cultural heritage & event professionals to begin their journey towards environmental action. The guides are focused on developing both environmental knowledge, as well as best practices, and include the key steps for both environmental governance and operations for events in cultural heritage city centres. The 'ROCK Sustainable Events' series covers the following topics:

1. Sustainable Food & Produce
2. Understanding and eliminating problem plastics

Who should read this guide?

This guide is for directors, managers and practitioners of cultural heritage and events who are looking to integrate environmental governance and practice within their event designs and operations.

1. Introduction: Quick Facts on Plastic

Plastic has been described as "*One of the most wasteful examples of our existing linear, take, make and dispose economy*." (Ellen MacArthur, 2019)

- More plastic has been manufactured in the last 10 years than in the entire last century [1].
- Around 80% of marine plastic pollution is from land-based products and sources, the biggest polluters being food packaging and containers, plastic bags, cigarette butts, bottles, caps and discarded fishing gear and nets [2].
- The Great Pacific Garbage patch - the world's largest floating collection of plastic in the ocean - is thought to be over 1 million square kilometres in area, almost twice the size of Texas [3].
- By 2050, there could be more plastic in the ocean than fish [4].
- Up to 51 trillion plastic particles are estimated to be floating in the ocean [5] .

** Microplastic are pieces of plastic smaller than 5mm in length. Microplastics are the result of larger pieces of plastic degrading and breaking into smaller pieces, or as a result of washing synthetic material clothes (e.g. nylon, polyester) – known commonly as microfibres. Microplastics are notoriously difficult to remove from the environment, making them one of the most pervasive forms of plastic pollution.*

2. Why tackle plastic pollution?

Image 1: Source: Keetley, A, (2016), 9 Reasons to Refuse Single Use Plastic

[1] Geyer, Roland, Jenna R. Jambeck, and Kara Lavender Law (2017). Production, use, and fate of all plastics ever made. University of Georgia. https://advances.sciencemag.org/content/3/7/e1700782.full

[2] Sherrington (2016) Plastics in the Marine Environment. Eunomia. https://www.eunomia.co.uk/reports-tools/plastics-in-the-marine-environment/

[3] Parker (2018) The Great Pacific Garbage Patch Isn't What You Think it Is. National Geographic. https://www.nationalgeographic.com/news/2018/03/great-pacific-garbage-patch-plastics-environment/

[4] Earth Day (2018) Fact sheet: Plastics in the Ocean https://www.earthday.org/2018/04/05/fact-sheet-plastics-in-the-ocean/

[5] Eriksen, M., Lebreton, L., Carson, H.S., Thiel, M., Moore, C.J., Borerro, J.C.m, Galgani, F., Ryan, P.G., Reisser, J., (2014), Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea, Pub Med, US National Library of Medicine, National Institutes of Health, available online: https://www.ncbi.nlm.nih.gov/pubmed/25494041 accessed 2/12/19

- Fossil-fuel based plastics are cheap, easy to make, and incredibly durable - taking up to one thousand years to decompose in some cases [6]. While this is a good quality for long-lasting products, these same qualities have created unexpected challenges with plastic management across the world.
- As global trade has grown over the years, single-use plastics have become one of the industry's largest markets – between 26-40% of new plastic made every year is discarded after just one use [7 8 9].
- 1 million seabirds and 100,000 marine mammals die from plastics and entanglement each year[10] and 180 species of recently surveyed animals have been found to ingest plastic, with numbers increasing year-on-year. [11] Over 8 million tonnes of non-biodegradable plastic is estimated to escape into the wider environment every year, accelerating the impacts on our oceans' biodiversity, as well as the ecosystems and industrial activities which depend on them.
- In the ocean, plastics act like a sponge for toxins and chemicals which can end up in human and animal tissues causing long term damage. Chemicals that leach from plastic pollution have been found to interfere with the most abundant bacteria in the ocean, which provides 10% of our oxygen supply. [12] Bisphenol A (BPA) one of the world's best-selling chemicals, found in kettles, water bottles and plastic packaging, CDs and DVDs, has been linked to a range of hormone related health effects including cancer and is also toxic to the human reproductive system.
- Plastic has been identified as a sharply growing emitter of greenhouse gasses – plastic products from the 1950's/ 60's are only just starting to degrade, emitting significant levels of methane and nitrous oxide in the process. With emissions from degrading plastics predicted to double over the next 20 years, reducing the volume of new plastic will be essential to curve future greenhouse gas (GHG) impacts [13]. In addition, buying less plastic will reduce the amount of GHG produced from oil extraction, manufacturing, transport and waste treatment of plastic goods [14 15].

2.1. The economic benefits of reducing plastics

- Reducing the volume of plastic waste will lower waste management costs for businesses, public bodies and local authorities.
- Designing-in 'reusability' and alternative, more regenerative materials into businesses and wider societal norms, will help reduce ongoing procurement and waste management costs[1,9].

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[6] UN Environmental Programme (2018) Single-Use Plastics: A Roadmap for Sustainability. https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf?sequence=1andisAllowed=y

[7] The Ellen MacArthur Foundation, World Economic Forum and The McKinsey Centre (2016) The New Plastic Economy. https://www.newplasticseconomy.org/assets/doc/EllenMacArthurFoundation_TheNewPlasticsEconomy_Pages.pdf

[8] Parker (2018) We Made Plastic. We Depend on it. Now We're Drowning in it. National Geographic. https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/

[9] European Parliament News (2018) Plastic waste and recycling in the EU: facts and figures. http://www.europarl.europa.eu/news/en/headlines/society/20181212STO21610/plastic-waste-and-recycling-in-the-eu-facts-and-figures

[10] United Nations, (2017), Factsheet: Marine Pollution for the Ocean Conference, https://sustainabledevelopment.un.org/content/documents/Ocean_Factsheet_Pollution.pdf, online accessed 20/12/19

[11] Nurdle Free Oceans. Plastic – Eaten by animals. Online interactive infographic & list of study references https://www.nurdlehunt.org.uk/whats-the-problem/eaten-by-animals.html#

[12] Tetu, S. G., Indrani Sarker, Verena Schrameyer, Russell Pickford, Liam D. H. Elbourne, Lisa R. Moore, Ian T. Paulsen, (2019) Plastic leachates impair growth and oxygen production in Prochlorococcus, the ocean's most abundant photosynthetic bacteria. Communications Biology; 2 (1)

[13] Marcie Grabowski (2018) Greenhouse gasses linked to degrading plastic, University of Hawai'I https://www.hawaii.edu/news/2018/08/01/greenhouse-gases-linked-to-degrading-plastic/

[14] WRAP UK (2019) The environmental, social and economic benefits of waste prevention. http://www.wrap.org.uk/content/environmental-social-and-economic-benefits-waste-prevention

[15] Sherrington & Hogg (2013) Exploring the Direct & Indirect Impacts of Plastic https://www.eunomia.co.uk/reports-tools/exploring-indirect-costs-litter/

- Marine plastic pollution is thought to cost around $4.7 billion dollars a year globally from lost revenue in fisheries, aquaculture and marine tourism – not including the cost of cleaning up beach litter or the chemical and physical impacts of marine pollution[2]. Limiting the environmental impacts of plastic will also limit the economic impacts on organisations and communities who depend on our oceans and rivers.
- The EU has already set a target to phase-out single-use plastics, as well as making all packaging recyclable by 2030 [16]. Using bans, levies and legislation, businesses and local authorities would be better off financially by switching to alternatives in the near future to avoid unnecessary costs [17].

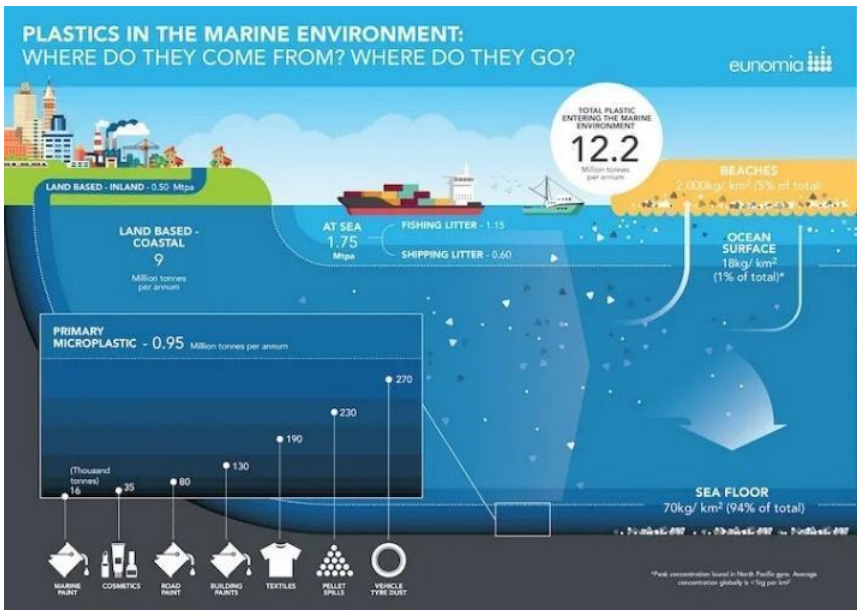


Image 2: Sherrington (2016) Plastics in the Marine Environment.

3. Understanding different types of plastics

Traditionally, the term 'plastic' was used to describe conventional fossil-fuel based (gas & oil), non-biodegradable plastic. Terms such as '*compostable*', '*bioplastic*' and '*biodegradable*' are becoming increasingly common, but all mean very different things in terms of sustainability and waste management options. For example, all plastics are biodegradable, but degradation may take 1 year or 500 years and still remain in the environment in some form (e.g. micro-plastics)[18]. Appendix 2 explains these differences in more detail.

Whilst there are numerous types of plastic, with different applications and qualities, the typical types we're likely to use every day include:

1. Polyethylene Terephthalate (PET)
2. High Density Polyethylene (HDPE)
3. Polyvinyl Chloride (PVC)
4. Low Density Polyethylene (LDPE)

[16] Phys.org (2018) EU sets 2030 target for recyclable plastic packaging https://phys.org/news/2018-01-eu-recyclable-plastic-packaging.html

[17] World Business Council for Sustainable Development (2017) The Business Case for Reducing Ocean Waste https://www.wbcsd.org/contentwbc/download/3380/44205

[18] WRAP UK (2018) Understanding plastic packaging and the language we use to describe it http://www.wrap.org.uk/sites/files/wrap/Understanding%20plastic%20packaging%20FINAL.pdf

5. Polypropylene (PP)
6. Polystyrene/Styrofoam(PS)

Appendix 2 and 3 provide a detailed list of names, properties and uses of common types of plastics, along with some sources of bio-based plastic alternatives.

3.1 The problem with bioplastics and compostable plastics

Biobased plastics or 'bioplastics' are made using polymers from plant-based renewable sources. They have many of the same properties as conventional plastics made from fossil fuels and therefore cause many of the same pollution problems.

Bioplastics are typically thought to be less energy-intensive to produce[19]. However, bio-based and bioplastics might not be best substitute for conventional plastics for a number of reasons:

- Bioplastics are not yet recycled with conventional plastics – not all waste management companies will take bioplastics for this reason.
- The biodegradability of different bioplastics can differ significantly, meaning some still won't decompose in natural environments.
- The wider impacts of bioplastics escaping into natural environments is still largely unknown.
- Bioplastics can be substantially more expensive than their fossil-based alternatives [20].

Compostable plastics that adhere to the standard EN 13432 means the material can be composted in industrial facilities (not home-composting) in twelve weeks, leaving no more than 10% of the original material in pieces bigger than 2mm, not worsening the soil structure or causing any harm to the soil through heavy metals. However, these industrial facilities are not currently widely available in many countries, meaning compostables may be sent to landfill where they take far longer to decompose. Instead of switching to bio-based or bioplastics, it's best to follow the top tiers of the hierarchy of waste principles first - try to reduce the amount of plastic waste before taking alternative steps. This will provide the greatest financial benefit with the biggest reduction in environmental impact, with typically the lowest costs.

4. Taking Action: Utilising the Waste Hierarchy

There's no 'one size fits all' solution, but applying the principles of the waste management hierarchy will help to inform what steps you need to take to eliminate and reduce single use and problem plastics and maximise reuse, recycling and recovery.

[19] Pever, Molenveld, Zee and Bos (2017) Bio-based and Biodegradable Plastics – Fact and Figures. Stichting Wageningen Research https://www.wur.nl/upload_mm/1/e/7/01452551-06c5-4dc3-b278-173da53356bb_170421%20Report%20Bio-based%20Plastic%20Facts.pdf

[20] UNEP (2015) Biodegradable Plastics and Marine Litter: Misconceptions, Concerns and Impacts on Marine Environments https://wedocs.unep.org/bitstream/handle/20.500.11822/7468/-Biodegradable_Plastics_and_Marine_Litter_Misconceptions,_concerns_and_impacts_on_marine_environments-2015BiodegradablePlasticsAndMarineLitter.pdf.pdf?sequence=3

AVOID: Are there any current uses or procurement of single use plastics that could be eliminated or replaced with sustainable/fully recyclable alternatives?
REDUCE: Could the volume of remaining plastic be reduced? e.g. returnable packaging schemes, refills schemes
REUSE: What can be reused before it's recycled? Are there creative ways of repurposing waste plastics (e.g. see Plastic Perfect case study) in creative programming or art work?
RECYCLE: Recycle remaining plastics (should be one type by this stage in hierarchy e.g. PET) ensuring plastics are segregated, not contaminated at collection.
RECOVER: Procure recycled plastics
TREAT: Can the waste be sent to an Energy From Waste plant or Anaerobic Digestion?
DISPOSE: The very end of the hierarchy, if you have procured plastics that can't be recycled then find the most sustainable disposal method of those available to you, with the least carbon and pollution impacts through consulting with your waste contractor or engaging your local authority.
Other key questions to ask

- Are there any incentives, campaigns or behaviour change initiatives you can plan to help support the transition?
- In what way could your policies and strategies be adapted to reflect a sustainable approach to plastics? e.g. your waste management policy or environmental strategy and action plan
- What are the best ways to engage key stakeholders to creative effective plastic policies and solutions?

From here you can set yourself a realistic plan and prioritise areas which have the highest impacts, largest expenditures, and which would be the easiest to act on. Make note of the challenges faced and create action plans to overcome them. Collect data and report regularly, sharing your successes with your audiences, customers and staff to engage them in the journey.

4.1 Taking Action: Steps to Reduce Consumption of Problem Plastics

Choose/ Utilise:

1. Reusable and refillable products from local suppliers (crockery, cutlery, bottles, mugs, towels etc.)
2. No packaging, where possible
3. Reusable packaging, where possible
4. Biodegradable and recyclable packaging (e.g. wood, paper, cardboard), if necessary
5. Certified compostable, biological products which your waste management contractor can sustainably dispose of (pens, tape, film, garbage bags, tea/ coffee, sugar, sauces etc.)
6. Uniforms and fabrics with no synthetic fibre materials (nylon, acyclic, polyester, rayon, polyolefin etc.). Look to use hemp, bamboo, cotton or other natural fibre alternatives
7. Procurement policies which focus on reusability, the waste hierarchy and prioritising compostable alternatives
8. Regular training, education and prompts (signs, posters) for staff and audiences on good waste management and segregation practices
9. Meaningful discussions with relevant stakeholders when designing environmental and sustainability policies and strategies (managers, suppliers, staff, industry experts etc.)

10. Strategies and policies which emphasise sustainable waste management and reducing plastics as part of the core message. Communicate this will all your suppliers & contractors
11. Waste management contractors with best environmental practices (segregation, collection, transport, and disposal)

Consider:

12. Switching suppliers to those with more sustainable environmental operations and products
13. Setting up renting, take-back or repair services for products such as computers, portable technology devices, furniture or production materials/ props- see Zero Waste Europe for Catalonia's e-Reuse programme
14. Organising beach or river clean-ups, a visit to a recycling centre, environmental initiatives and informative talks for employees or the local community
15. Setting up suggestion boxes and 'green teams' for employees to suggest and discuss ideas
16. Sharing success stories on social media and amongst employees/stakeholders

Avoid:

17. Single-use plastics (bottles, packaging, straws, stirrers, serve-ware etc.)
18. Items with microbeads, such as cleaning and health products
19. Incorrect segregation – recycling or composting unknown materials and products
20. Purchasing and cleaning uniforms, clothing and materials with synthetic fibres
21. Washing machines without fibre-catching filter technology

5. Case Studies

5.1 The Maldives and Collaborative Approaches to Waste Management

The Maldives, once known for its immaculate beaches, lagoons and picture-perfect coastal communities, has become a prime example of the impacts of climate change and ocean plastics. The small population across its 1,190-islands has seen extreme changes and challenges in the last 40 years – domestic waste from businesses and houses, once filled with natural and biodegradable materials, is now overflowing with conventional plastics, putting huge strain on local waste management systems. Meanwhile, the amount of waste carried in by ocean currents has exploded in recent years, as plastic waste from neighbouring countries has increased in volume and continues to escape into the neutral environment and oceans [21].

In beginning the journey to solve these extremely complex issues, the Republic of the Maldives government has utilised a range of methods and stakeholders. It first secured international funding for investment in new solid waste management disposal facilities across the islands, helping local authorities to better manage the 365,000 tonnes of solid waste produced every year by businesses and households in a more environmentally-safe way [22]. The government's partnerships and engagement with large multinational organisations and NGOs are also helping manage marine plastic litter, by providing genuinely valuable products made from recycled plastics. In 2018, Parley

[21] IUCN (2018) Garbage In, Garbage Out: Waste Management in the Maldives https://www.iucn.org/news/asia/201801/garbage-garbage-out-waste-management-maldives

[22] World Bank (2017) Maldives to Improve Solid Waste Management with World Bank Support https://www.worldbank.org/en/news/press-release/2017/06/23/maldives-improve-solid-waste-management

and Adidas collaborated to produce 100 handmade shoes and sportswear products such as shoes, flip flops and shorts for export [23], whilst spreading awareness for ocean conservation and the ongoing impacts of plastic pollution. Also, by empowering local organisations, key members of the community have been engaged and support has been gathered to educate people on the impacts, solutions, and most importantly, the social, environmental and economic benefits of a sustainable approach to plastics.

The work being carried out in the Maldives is still in its early stages, but the results so far have been promising. Parley continue to recycle up to 500kg of plastic a day, and their Ocean School programme has engaged over 100,000 students in over 70 schools [24]. In September 2019, the Republic of the Maldives and Parley announced the launch of a new model which places sustainability and non-toxic materials at the heart of the economy [25]. The actions in the Maldives shows us that policy and actions are most effective when they support local efforts with partnerships and complementary approaches to public issues. Ensuring the necessary infrastructure for waste management is crucial, but local authorities cannot act alone in their fight against complex social and environmental problems.

5.2 PlasTax Levies in the Republic of Ireland

In the 1990's, plastic bags were notorious in Ireland for countryside and coastal litter, resulting in the government commissioning a study in 2002 into how to solve the plastic litter issue. The study uncovered that around 1.26 billion plastic bags were being handed out every year, meaning every person in Ireland was consuming around 328 bags a year - just under one a day.

After detailed consultations with key stakeholders, including retailers, manufacturers and citizens, the government introduced a €0.15 charge on most plastic bags in the same year – 6 times the rate at which citizens had said they would be willing to pay, measured at €0.024 during the study – to promote the use of reusable bags and curve over consumption. Any revenue from the tax would feed back into the Environmental Fund, creating a close association between environmental costs and benefits for those paying the levy. The levy was accompanied with a strong, public-facing campaign to promote the beneficial effects of reducing plastic, showcasing environmental best practices and to provide transparency on the purposes of, and uses of the new tax revenue.

The results of the levy showed a 90% reduction in plastic bags a year, plastic bags per person dropped from 328 to just 21, whilst public opinion of environmental conservation also improved. The levy on plastic bags in Ireland was considered a success, but a follow up impact assessment four years later showed that usage was rising again, at 31 bags per person per year in 2007. Authorities took quick action, increasing the levy to €0.22, again, proving a success in reducing consumption. Further legislation in 2011 allowed for the levy to increase proportionally per year in order to keep the number of plastic bags below 21 bag per person per year.
Similar plastic regulations have been employed in countries and cities across the world, including Cambodia, Bulgaria, South Africa, Estonia, the Netherlands, Lithuania, Denmark, Spain, Taiwan, the United Kingdom and numerous states in the USA. The lessons from these examples demonstrates that setting appropriate levy can positively influence audience and consumer behaviour, but such

[23] Maldives Independent (2018) Maldives opens first plastic recycling lab and vending machine https://maldivesindependent.com/environment/maldives-announces-campaign-to-intercept-ocean-plastic-131100

[24] Maldives Independent (2019) The Maldives Plastic Warriors https://maldivesindependent.com/feature-comment/the-maldives-plastic-warriors-145602

[25] Sustainable Brands (2019) Maldives, Parley for the Ocean Creating New Model for Healthy 'Future Island Nations' https://sustainablebrands.com/read/collaboration-cocreation/maldives-parley-for-the-ocean-creating-new-model-for-healthy-future-island-nations

policies cannot rely solely on financial incentives to be successful. Regulations, especially bans or levies, must be accompanied by effective public engagement and awareness campaigns to generate buy-in from citizens, retailers and manufacturers. They must also be designed in collaboration with a range of stakeholders, and reviewed periodically to maintain their effectiveness [26].

5.3 Precious Plastic (https://preciousplastic.com)

Precious Plastic is a world-wide community-based business model focused on reusing and repurposing waste plastic. Hundreds of people form the network who are setting up workshops in containers and other alternative spaces, taking waste plastic and recycling it into a range of creative products from household goods to fashion, art work, modular designs, construction or high precision items such as phone cases. The new products are made using machines that can be built cheaply from materials that are readily available.

[26] Convery & McDonnel (2007) The most popular tax in Europe? Lessons from the Irish plastic bags levy https://link.springer.com/article/10.1007%2Fs10640-006-9059-2

6. Appendices

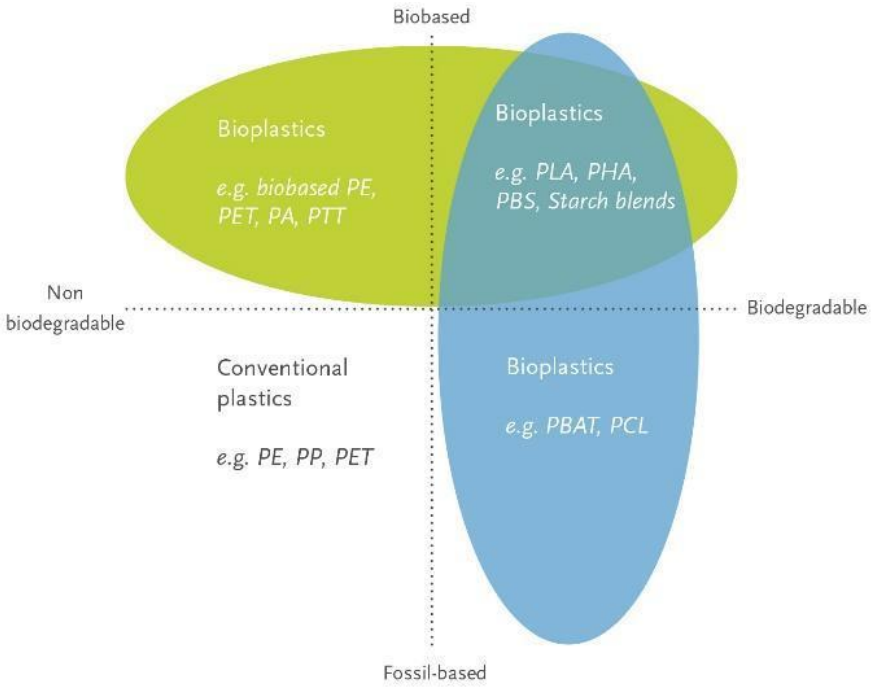
Appendix 1: Checklist for Reducing Plastics

Use this checklist to set a baseline of the existing practices and policies, and to identify what action are needed to improve waste plastic management. We advise you review this checklist periodically (at least annually) to identify which actions have been taken, what targets have been reached, and what new objectives need to be set in order to continuously improve performance and reduce your plastic footprint.

Item	N/A	Yes	Plan to	No	How can we improve?
Policies					
Do you have policies, including procurement policies, on plastics and does it include a commitment to reduce single-use, non-compostable plastics?					
Do your policies on plastic and waste include specific, measurable, time-bound targets? e.g. "*a maximum of 2 tonnes a year of grade 1 or 2 plastics by 2020, correctly segregated and recycled with a reliable waste management provider*"					
When reviewing, creating or updating policies, do you engage all available and relevant stakeholders?					
Do you utilise the waste hierarchy principles in action plans, strategies and procurement policies?					
Do you actively communicate your plastic policies to all employees, partners, suppliers, vendors and audiences?					
Procurement					
Does the procurement policy specify for plastic free, or reusable packaging from suppliers, vendors and contractors?					
Does the procurement policy detail the need for reusable, compostable or easily recyclable plastic products?					
Does the procurement policy make use of contract clauses to limit the volumes and types of plastic?					
Does the procurement policy use contract clauses to limit what packaging materials can be used?					
If you are to purchase bio-base or biodegradable plastics, do you ensure these are to EN13432 or E14995 standards?					
Have single-use plastics been replaced with reusable or compostable alternatives where appropriate? (e.g. serve-ware, cutlery, condiments)					
Are purchasing managers and departments kept up to date on any changes in policy or new targets?					
Are there training sessions, resources and regular updates on policies for purchasing managers on sustainable plastics and waste?					
If you have a work uniform, do you provide or encourage employees to buy natural fibre uniforms?					
Waste Management					
Do you use a trusted, reputable waste management supplier?					

Do you know specifically which plastics and materials your waste management provider can collect and process by waste stream? (i.e. mixed recycling, composting, landfill, energy from waste)					
Do you know specifically what materials or items are excluded from certain waste streams by your waste management provider?					
Have you communicated all available information on waste management to purchasing managers?					
Does your waste management provider detail how waste is managed, by material and waste stream?					
Have you spoken to your waste management provider on any advice, help or additional services they can provide to improve waste sustainability, including staff training?					
Do you regularly tender your waste management contract, with specific requirements on plastic and waste preferences?					
Do you know how waste is collected and transported, if this is sustainable or optimised with low-emission technology or driving route optimisation technology?					
Operations					
Do you provide employees and audiences with reusable/ compostable alternatives to single-use plastics? (e.g. cups, cutlery)					
Have single-use sachets, condiments, tea and coffee been replaced with refillable, plastic free alternatives?					
Do you provide free water refills, or plastic free alternatives to plastic bottled water?					
Is waste plastic measured regularly and by waste-stream? (i.e. landfill, recycling, composting etc.)					
Do you actively monitor any incoming waste from suppliers or vendors?					
Do you use these insights to inform decision makers and set yearly reduction targets?					
Is plastic and waste documented annual reports/ management reports and meetings with associated KPI's to monitor?					
Do you use social media to promote reducing single-use plastics with audiences?					
Do you provide clear signage for audiences and staff to communicate how to segregate at waste disposal points? (i.e. list what materials/ products go in which bin)					
Do you provide training for staff on using, storing, collecting and disposing of different types of plastics and waste?					
If you provide laundry services, have you retrofitted washing machines/ dryers with fibre-catching filters, or use organisations who do?					
Total					

Appendix 2 – The key differences between bio/ fossil-based plastics, biodegradable and non-biodegradable plastics



	Non-Biological	Biodegradable	Compostable
Recycling	✓ *(check locally)*	✗	✗
Energy from Waste	✓	✓	✓
Landfill	✓	✓	✓
Anaerobic Digestion (AD)	✗	✗ *(check locally)*	✓
Composting	✗	✗	✓

From: European Plastics
https://www.european-bioplastics.org/bioplastics/materials/

Based on WRAP: Understanding Plastic Packaging http://www.wrap.org.uk/sites/files/wrap/Understanding%20plastic%20packaging%20FINAL.pdf

Appendix 3: Uses and end-of-life options for different types of plastics

Type of plastic	Examples and applications	Pros	Cons
Conventional plastics, non-biodegradable	PET, PP, PE PET is strong, transparent, durable, light-weight and has a wide range of applications e.g. bottles, jars, bottled health products, fibre for clothes, carpets and can be repurposed	Some are widely recycled e.g. PET Can be reused a number of times e.g. water bottles but this relies on consumer behaviour Considered inert in landfill	Fossil fuel based, carbon emissions from extraction, transport, processing and pollution impacts if released in the environment When sent to incineration / energy from waste facilities further emissions are released which can be higher than from coal or natural gas production
Biobased plastics, non-biodegradable	PET, PA, PE, PTT Polyamides (Nylon) are a large family of engineering plastics with a good balance of properties, for example, resistant, endure high temperatures, good chemical resistance, low gas permeability	Large range of applications and long life span due to resistance to wear	Release pollution and greenhouse gases when they biodegrade Can't be recycled easily in the same way as non-biodegradable plastics Can cause issues in segregation process leading to plastics sent to landfill
Bio-based, 'biodegradable'	PLA, PBS, PLA, Starch Blends 80% of bio-based plastics are made using starch-based substances as feedstock e.g. maize, potato, cassava, oats, rice, wheat.	Made from renewable resources Considered carbon neutral if they are incinerated with energy recovery 'energy from waste'	May compete with land for crops When they biodegrade in landfill or natural environment, they produce methane, a powerful greenhouse gas May not be clearly labelled causing confusion to the consumer Lack of evidence in terms of environmental impacts and properties in water
Fossil fuel-based 'biodegradable'	e.g. PBAT, PCL two types of biodegradable polyester		Made from non-renewable carbon intensive source
Compostable	Compliance with the standard EN 13432 means the material can be composted in industrial facilities in twelve weeks, leaving no more than 10% of the original material in pieces bigger than 2mm, not worsening the soil structure or causing any harm to the soil through heavy metals.	Can be made into products with similar properties to conventional plastic Can be considered a better option than single use plastics if correct waste contracts are in place e.g. potential for positive impact in food and catering where plastic is often contaminated by food waste.	Confusion between home composting and industrial composting- two very different processes Cannot be recycled widely in the UK, and if not composted ends up in energy from waste facilities or landfill.

Information sourced from WRAP: Understanding Plastic Packaging http://www.wrap.org.uk/sites/files/wrap/Understanding%20plastic%20packaging%20FINAL.pdf

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