

GUIDELINES TO TACKLE SINGLE-USE PLASTIC PRODUCTS IN THE MEDITERRANEAN REGION



Note: the SCP/RAC centre changed its name in May 2022 and officially became:
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ABOUT

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SCP/RAC has an official mandate from the Contracting Parties to the Barcelona Convention to engage in international cooperation with Mediterranean countries on the prevention of plastic pollution, including marine litter and on the development and innovation in the business sector. In addition, SCP/RAC is a Regional Centre under the Stockholm Convention on Persistent Organic Pollutants and develops a number of actions related to plastic pollution under this framework.

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FOREWORD

The Eighteenth Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (“the Barcelona Convention”), held in Istanbul, Turkey, from 3 to 6 December 2013, adopted Decision IG.21/7 related to the Regional Plan on Marine Litter Management in the Mediterranean in the Framework of Article 15 of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities (LBS Protocol) to the Barcelona Convention, hereinafter referred to as the Marine Litter Regional Plan.

Furthermore, and in accordance with Article 14 of the Marine Litter Regional Plan, the Secretariat in cooperation with relevant international and regional organisations, is mandated to prepare specific guidelines taking into account where appropriate existing guidelines, to support and facilitate the implementation of measures provided for in Articles 9 and 10 thereof, whereby, subject to availability of external funds, such guidelines shall be published in different Mediterranean region languages.

The MAP Programme of Work (PoW) 2020–2021 adopted by the 21st Ordinary Meeting of the Contracting Parties to the Barcelona Convention and its Protocols, held in Naples, Italy, from 2–5 December 2019, contained several activities addressing marine litter and plastics, including the development of a set of guidelines to support Contracting Parties in tackling single-use plastic products. In addition, UNEA4 held in May 2109 adopted a specific resolution on Addressing Single-use Plastic Products Pollution (UNEP/EA.4/L.10).

Single-use plastic products (SUPs) rank among the most commonly found marine litter items in the Mediterranean Sea. The Regional Plan on Marine Litter Management in the Mediterranean includes concrete actions on SUPs

on Article 9 Prevention. Furthermore, COP22 (December 2021) adopted the Decision IG.25/9 upgrading this Regional Plan, including further provisions on tackling SUPs. The Decision explicitly mentions these guidelines as a tool to support Contracting Parties. The guidelines, have followed a thorough revision process including the approval by the SCP/RAC National Focal Points during their last meeting in June 2021. Hence, the Contracting Parties are committed to make best use of these guidelines. These guidelines complement four set of guidelines developed by the UNEP/MAP system, adopted at the 21st Ordinary Meeting (Decision IG.24/11): Adopt-a-Beach; Phase-out of Single Use Plastic Bags; Provision of Reception Facilities in Ports and the Delivery of Ship-Generated Wastes; Application of Charges at Reasonable Costs for the Use of Port Reception Facilities.

The proposed guidelines build on the review and lessons learnt of international cases, the work undertaken by key organisation on SUPs, and the fit-for-purpose Information document.¹ They intend to provide policy-makers with a common understanding of the set of measures that can be considered in developing the most appropriate framework to prevent the negative impacts of SUPs, including marine litter generation, in the signatory countries of the Barcelona Convention. They first discuss and outline SUP of concern in the Mediterranean region. Secondly adequacy and feasibility of policy options are discussed. Finally, the guidelines tackle the policy making process, including analysis and implementation. While these guidelines focus on the full process of decision making, from absence of actions to reduce SUPs to a comprehensive programme to tackle them, they can also be used to complement and strengthen actions in countries where the process is on-going. In fact, experiences show loopholes and obstacles in different countries and these guidelines intend to contribute in overcoming them.

1 Eunomia (2021). Information Document for the preparation of guidelines to tackle single-use plastic items in the Mediterranean. Report for SCP/RAC. http://www.cprac.org/docs2/information_document_preparatio_of_guidelines_for_sups.pdf

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LIST OF ABBREVIATIONS/ACRONYMS

BaU	Business-as-usual	SCP/RAC	Regional Activity Centre for Sustainable Consumption and Production
DRS	Deposit Refund System	SUPs	Single-use plastic products/items/packaging
EPR	Extended Producer Responsibility	SUNPs	Single-use non-plastic products/items/packaging
EU	European Union	UNEA	United Nations Environment Assembly
GHG	Greenhouse gases	UNEP	United Nations Environment Programme
HORECA	Hotels/Restaurants/Cafés		
LCA	Life-cycle assessment		
MAP	Mediterranean Action Plan		
MUs	Multi-use products/items/packaging		

GUIDELINES TO TACKLE

SINGLE-USE PLASTIC

PRODUCTS IN THE

MEDITERRANEAN REGION



1. INTRODUCTION



1.1. SCOPE

Marine plastic pollution poses a serious threat to the aquatic environment and to human health across the world. In the Mediterranean, as a semi-enclosed basin with a dense coastal population and strong tourism and maritime industries, the problem of marine litter is particularly acute. It is estimated an annual plastic leakage of 229,000 tonnes, made up of 94% macroplastics and 6% microplastics in the region.² Plastics are estimated to account for around 95% of the waste in the open sea, on the seabed and on beaches across the Mediterranean,³ and single-use plastics products (SUPs) on beaches are often the most abundant litter.

The Regional Plan on Marine Litter Management in the Mediterranean,⁴ adopted by the Contracting Parties to the Barcelona Convention in 2013, urged national authorities to take action to prevent plastic leakage into the environment (Article 9, among others). In December 2019, Contracting Parties to the Barcelona Convention, requested an upgrade of the Regional Plan to account for latest developments and priorities. One of the aspect subject to the upgrade are the provisions tackling single-use plastic products. The upgrade aligned with the commitments of countries at the regional level, through the Naples Ministerial Declaration of COP21, the UfM 2030 Greener Med Agenda as well as at the global level through UNEA4 Resolution of SUPs,⁵ the 2030 Agenda for Sustainable Development and amendments to the annexes of the Basel Convention. The EU SUP Directive, even if not applicable to all Barcelona Convention Contracting Parties, constitutes a major step forward in the regulation of SUPs, to be taken in account, inform this process.

'Single-use plastic product' means a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned

to a producer for refill or re-used for the same purpose for which it was conceived.⁶ Although some microplastics e.g. microbeads in cosmetics and pellets can be considered as single-use, they are not included in the scope of the guidelines, nor is fishing gear.

Measures on SUPs have already been taken in Mediterranean countries, particularly targeting bags and bottles. Few countries are addressing other SUPs such as straws, cotton buds or cigarette filters, through different policy measures and at different geographical scales. EU countries are an exception since the entry into force of the Directive 2019/904, on the reduction of the impact of certain plastic products on the environment, by which they tackle a comprehensive list of SUPs.

These guidelines intend to provide a common understanding of the set of measures that can be considered in developing the most appropriate framework to prevent the negative impacts of SUPs in the signatory countries of the Barcelona Convention, hence helping them to respond to global and regional commitments. Notwithstanding, it is important to acknowledge the different baseline in each of the countries. Whereas the EU provides for harmonised approach, the situation in non-EU countries varies widely, and even though few specific measures are in place, overall waste management policies address SUPs to a certain extent (e.g. EPR schemes). While these guidelines focus on the full process of decision making, from absence of actions to prevent SUPs to a comprehensive programme to tackle them, they can also be used to complement and strengthen actions in countries where the process is on-going. In fact, experiences show loopholes and obstacles in different countries, and these guidelines intend to contribute in overcoming them.

2 IUCN (2020) The Mediterranean: Mare Plasticum, <https://portals.iucn.org/library/node/49124>

3 UNEP/MAP (2017). 2017 Mediterranean Quality Status Report. https://www.medqsr.org/sites/default/files/inline-files/2017MedQSR_Online_0.pdf

4 UNEP/MAP (2013). Regional Plan for the Marine Litter Management in the Mediterranean <https://wedocs.unep.org/rest/bitstreams/8222/retrieve>

5 Resolution 4/9 encourages States Members to develop and implement national or regional actions, as appropriate, in order to address the environmental impact of single-use plastic products, to take comprehensive action with regard to single-use plastic products in addressing related waste through, where appropriate, legislation and to take other actions to promote alternatives to single-use plastics, improve waste management and develop sustainable consumption patterns.

6 DIRECTIVE (EU) 2019/904 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on the reduction of the impact of certain plastic products on the environment, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904>

These guidelines target policy-makers and provide them with a step-by-step approach for developing the most appropriate framework to prevent the negative impacts of single-use plastic products, including marine litter generation. They first discuss and outline SUPs of concern in the Mediterranean region. Secondly policy options are presented, including alternatives, feasibility and potential effects. Finally, they tackle the policy making process through a roadmap, including analysis and implementation. Notwithstanding, non-governmental stakeholders have a key role to play in tackling SUPs and their engagement and action is essential to abate this issue.

These guidelines intend to complement the following set of Barcelona Convention guidelines to support the implementation of the Marine Litter Regional Plan: “Guidelines to phase out single-use plastic bags in the Mediterranean” (adopted at COP21) and “Guidelines to address single-use plastics through public procurement in the Mediterranean” (prepared through the Cooperation Agreement between UNEP/MAP and the Italian Ministry of Environment, Land and Sea). It is important to highlight the work carried out by UNEP in developing the Legislative Guide for the regulation of Single-Use Plastic Products,⁷ following UNEA resolutions. This guide includes relevant complementary information for Mediterranean countries, as well as case studies, and it is cited in the present guidelines as further reading in particular chapters.

In preparation of the guidelines, an Information Document has been produced to gain knowledge on the situation of SUPs in the Mediterranean.⁸ This has been done considering four countries as case studies. The research included the estimation of consumption of particular SUPs, as well as the potential effect of policy measures. The Information Document is explicitly cited throughout these guidelines for in-depth information.

Elements in these guidelines build on the experience and lessons learnt from projects implemented in the region. In particular, regional and national activities of EU-funded Marine Litter Med allowed for addressing key aspects in relation to plastic bags and EPR, which are accounted

in these guidelines. Outcomes of the regional capacity building activity of the EU-funded WES project on SUPs have been taken into consideration as well. Upcoming activities of both projects at national level will allow promotion and implementation of the guidelines in Southern Mediterranean countries, as well as through the Cooperation Agreement between UNEP/MAP and the Italian Ministry for the Ecological Transition.

1.2. ISSUE⁹

Plastics are one of the main materials of the modern economy due to their multiple properties, applications and low cost. Their use has been growing exponentially since the 1950s, and is expected to double in the next 20 years.¹⁰ An important reason for this growth is the increase in the single use of plastic. Likewise, there is sufficient evidence today that the proliferation of plastics is having an unacceptable impact on the environment, health and our societies.

In a sea which covers less than 1% of the world’s oceans, but accounts for around 10% of the world’s biodiversity, the Mediterranean is now estimated to hold up to 55% of all floating ocean plastic particles and concentrates 7% of all global microplastics.^{11 12 13} Marine plastic litter also deposits on the sea bed and beaches, with around 5.1kg of plastic waste accumulating along each kilometre of Mediterranean coastline every day.¹⁴

Single-use plastic products (SUPs) are designed to be used only once before they are disposed of. They commonly include plastic bags, plates, tableware, straws, stirrers, food and beverage containers, packaging, cups and cup lids, cigarette filters, cotton bud sticks, wet wipes, sanitary towels, balloons, etc.

SUPs are prone to littering and prevalently ending in the marine environment or clogging sewage systems due to a combination of factors including: low production cost, short use phase, a consumption trend of convenience and predominantly away from home and the lack of incentives for proper waste collection and treatment. As a result,

7 UNEP (2020) TACKLING PLASTIC: Legislative Guide for the regulation of Single-Use Plastic Products. <https://wedocs.unep.org/bitstream/handle/20.500.11822/34570/PlastPoll.pdf.pdf?sequence=3&isAllowed=y>

8 Eunomia (2021). Information Document for the preparation of guidelines to tackle single-use plastic items in the Mediterranean. Report for SCP/RAC. http://www.cprac.org/docs2/information_document_preparatio_of_guidelines_for_sup.pdf

9 Extended information of this section can be found in the Information Document, section 2.1.1 Extent and Nature of SUP Pollution in the Mediterranean

10 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The New Plastics Economy – Rethinking the future of plastics. <http://www.ellenmacarthurfoundation.org/publications>

11 European Commission (2019) New tool to track plastic pollution in the Mediterranean Sea, accessed 11 August 2020, <https://ec.europa.eu/jrc/en/science-update/new-tool-track-plastic-pollution-mediterranean-sea>

12 UNEP/MAP –SPA/ RAC (2010), The Mediterranean Sea Biodiversity: state of the ecosystems, pressures, impacts and future priorities, https://www.rac-spa.org/sites/default/files/doc_cop/biodiversity.pdf

13 Suaria, G., Avio, C.G., Mineo, A., et al. (2016) The Mediterranean Plastic Soup: synthetic polymers in Mediterranean surface waters, Scientific Reports, Vol.6, No.1, p.37551

14 Liubartseva, S., Coppini, G., Lecci, R., and Clementi, E. (2018) Tracking plastics in the Mediterranean: 2D Lagrangian model, Marine Pollution Bulletin, Vol.129, No.1, pp.151–162

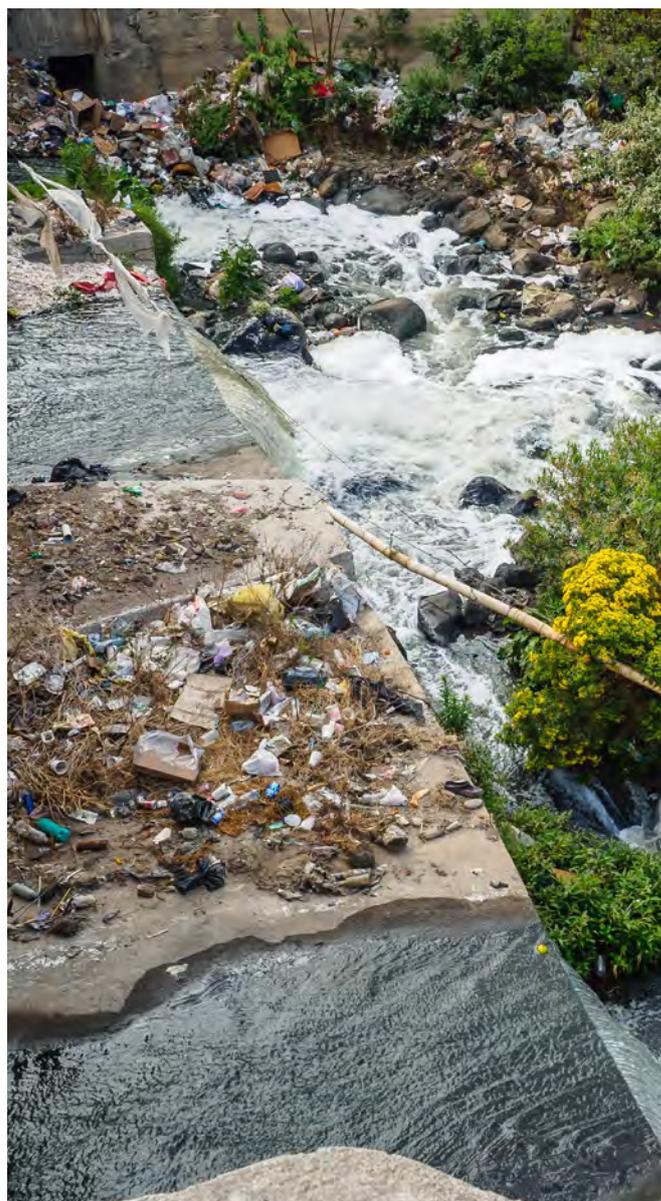
SUPs have a predominant presence in the marine litter composition across the Mediterranean, as explained in detail in the next chapter.

In addition, the COVID-19 pandemic raised additional challenges in relation to SUPs, mostly in three aspects: new items, especially masks and gloves; intensification of the single-use of certain products due to safety/sanitary considerations; and an increase in SUPs related to take-away food and beverage.

In relation to sources and pathways, not only the Mediterranean region is the world's fourth largest plastic producer, but the populations of the region produce some of the highest quantities of solid urban waste per capita, at 208–760kg/yr.¹⁵ Moreover, items found on Mediterranean beaches show a prevalence of land-based litter stemming predominantly from recreational/tourism activities. As a result, marine litter on the Mediterranean coast can increase by around 40% during the peak tourist period. As for waste handling, mismanagement remains a key issue across the region, although, it is more of a challenge in some countries compared to others. It is suggested that around 6 million tonnes of plastic waste are mismanaged every year in the basin, with southern Mediterranean countries recycling, on average, less than 10% of their plastic waste.¹⁶

Typically, plastic waste which is directly littered or dumped into the environment or which leaks from the waste management system enters rivers, finally ending up in the sea. This includes pathways for waste that is, for example, incorrectly flushed (e.g. wet wipes, tampons, cotton buds) or littered along roadways (e.g. on-the-go food and beverage packaging), thereby entering wastewater and stormwater sewage systems that empty into waterways, or alternatively waste that is collected but subsequently blown or washed out of unmanaged landfills or windswept during transportation, in addition to the more obvious wastes that are illegally dumped, littered and fly-tipped terrestrially. Plastic waste is particularly susceptible to being transported during wind and flood storm events, due to its lightweight, non-biodegradable and durable nature. The rivers Po, Seyhan, Ceyhan and Nile are amongst a number of large rivers which feed into the Mediterranean, representing some of the most valuable coastal ecosystems in the region, but also key pathways for land-based plastic litter to enter the sea.¹⁷ The problem is exacerbated because the Mediterranean is a semi-enclosed sea in which a big number of seasonal run-offs (riverine inputs) are as well significantly contributing with marine litter loads entering into the basin.

A number of scientific publications confirm that plastic pollution poses a major threat to marine biodiversity and the ecosystems within the marine environment, thereby threatening key economic sectors (such as fisheries and tourism), as well as negatively impacting air and water quality, and ultimately, human health. Although SUPs as a whole have an ecological impact (e.g. generation of microplastics, ultimately ingested by marine species), the degree of harm of each item can be differentiated. For example, cigarette filters pollute marine waters through chemical release, and plastic bags are more likely to entangle marine wildlife.



15 WWF (2018) Out of the plastic trap: saving the mediterranean from plastic pollution, accessed 11 August 2020, https://mcc.jrc.ec.europa.eu/documents/Marine_Litter/MarineLitterTOPItems_final_24.1.2017.pdf

16 Ibid.

17 WWF (2018) STOP THE FLOOD OF PLASTIC: How Mediterranean countries can save their sea, accessed 11 August 2020, https://www.wwfmmi.org/newsroom/latest_news/?uNewsID=348053

2. SINGLE-USE PLASTIC PRODUCTS TO BE TACKLED IN PRIORITY IN THE MEDITERRANEAN



There is a wide variety of plastic products and packaging that can be considered as single-use in modern society. Their prevalence as marine/beach litter is often used as a proxy for SUPs prone to littering, and therefore subject to public concern and policy intervention. Notwithstanding, problematic materials and formats for example in terms of recycling, as well as chemical additives (a number of them may lead products to be more or less hazardous, both for the environment and human health) shall be acknowledged as important criteria to determine concern.¹⁸ SUPs can be also identified and prioritized through public consultation, and as far as possible on the basis of information on the local/national context.

In the Mediterranean, the most recent and comprehensive regional analysis of marine litter characterization has been undertaken by the Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL) of UNEP/MAP using official monitoring data deriving from countries, to propose updated baseline values, and to subsequently recommend related threshold values for IMAP¹⁹ Ecological Objective 10 (Marine Litter) Common Indicator 22 (beach macrolitter).^{20 21} This work includes the relative and cumulative frequency for the full UNEP/MAP list for beach marine litter items, providing the Mediterranean Top-10 marine litter items and the Mediterranean Top-X (80%) marine litter items, as it follows:

18 SCP/RAC and IPEN (2020). Plastic's toxic additives and the circular economy. This report was originally released as an Information Document to Delegates for the 2019 Conference of the Parties to the Basel and Stockholm Conventions (UNEP/CHW.14/INF/29/Add.1 and UNEP/POPS/COP.9/INF/28/Add.1). The report covers the presence and impact of the hazardous chemicals of concern in all stages of plastic product use-cycle from production and use, to recycling and landfill, incineration, waste to energy, and land and marine accumulation, and addresses their associated impacts on human, marine biota, and environmental health.

http://www.cprac.org/sites/default/files/otherfiles/plastics_-_additives_-_final_-_english_-_high_0.pdf

19 Integrated Monitoring and Assessment Programme

20 MED POL – UNEP/MAP (2021). Updated Baseline Values and Proposal for Threshold Values for IMAP Common Indicator 22. Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation (CORMONs). UNEP/MED WG.482/23/Rev.1

21 Data provided by the Contracting Parties represent 58% of the total length of the Mediterranean coastline.

Table 1:
Mediterranean Top-10 and the Mediterranean Top-X (80%) for beach marine litter items

		UNEP Code	ITEM NAME	SUP	Macro-Category
Mediterranean Top-X (80%) Marine Litter Items	Mediterranean Top-X (80%) Marine Litter Items	G76	Plastic/polystyrene pieces 2.5 cm > < 50 cm	No	Plastic/Polystyrene
		G27	Cigarette butts and filters	Yes	Plastic/Polystyrene
		G21/G24	Plastic caps and lids (including rings from bottle caps/lids)	Yes	Plastic/Polystyrene
		G95	Cotton bud sticks	Yes	Sanitary Waste
		G7/G8	Drink bottles	Yes	Plastic/Polystyrene
		G30/G31	Crisps packets/sweets wrappers/Lolly sticks	Yes	Plastic/Polystyrene
		G124	Other plastic/polystyrene items (identifiable) including fragments	No	Plastic/Polystyrene
		G50	String and cord (diameter less than 1 cm)	No	Plastic/Polystyrene
		G208a	Glass fragments >2.5cm	No	Glass
		G200	Bottles (including identifiable fragments)	No	Glass
		G73	Foam sponge items (i.e. matrices, sponge, etc.)	No	Plastic/Polystyrene
		G34/G35	Cutlery, plates and trays / Straws and stirrers	Yes	Plastic/Polystyrene
		G3	Shopping bags incl. pieces	Yes	Plastic/Polystyrene
		G10	Food containers incl. fast food containers	Yes	Plastic/Polystyrene
		G33	Cups and cup lids	Yes	Plastic/Polystyrene
		G204	Construction material (brick, cement, pipes)	No	Ceramics
		G152	Cigarette packets	No	Paper/Cardboard
		G67	Sheets, industrial packaging, plastic sheeting excluding agriculture and greenhouse sheeting	No	Plastic/Polystyrene
		G4	Small plastic bags, e.g. freezer bags incl. pieces	Yes	Plastic/Polystyrene
		G175	Cans (beverage)	Yes	Metal
G54	Nets and pieces of net > 50 cm	No	Plastic/Polystyrene		
G158	Other paper items (including non-recognizable fragments)	No	Paper/Cardboard		
G145	Other textiles (including pieces of cloths, rags, etc.)	No	Cloth		

The table above demonstrates a high occurrence of SUPs in the composition of beach litter, nearly half of total items. Another recent study carried out in the Mediterranean coastline, reported that SUPs accounted for 38% of all items recorded, ranging from 18.6% to 66.9% for the different beaches; while 30% of the investigated beaches had more than 50% of SUPs of the total items recorded.²²

22 Vlachogianni, Th, Skocir, M., Constantin, P., Labbe, C., Orthodoxou, D., Pematzoglou, I., Scannella, D., Spika, M., Zissimopoulos, V., Scoullou, M., 2019. Plastic Pollution on the Mediterranean Coastline: Generating Fit-For-Purpose Data to Support Decision-Making via a Participatory-Science Initiative. Science of the Total Environment, p. 135058.

Using beach litter information as a reasonable proxy to identify SUPs to be tackled in priority, the Top-10 SUPs beach litter items is depicted in Table 2.

Some considerations are to be made. Firstly, following the same approach as in the EU, it is reasonable to group items according to source (i.e. sanitary applications for WC flushed items) and product constituency (i.e. drinks bottles, caps and lids). Secondly, as for sanitary applications (aggregation of wet wipes, sanitary towels/panty liners/backing strips, diapers/nappies, condoms (incl. packaging), tampons and tampon applicators and toilet fresheners), they have a low frequency at the regional scale. However, considering human health implications, they may be considered as priority SUPs. Finally, single-use plastic items such as film packaging and agriculture related plastics may result into small plastic pieces being found as marine litter, hence attention should be given to address them.

Additionally, the current situation with COVID-19 pandemic has raised great concern on personal protective equipment ending up as marine litter, particularly single-use plastic masks and gloves. These items are increasingly being found as marine litter, although scientific literature is still scarce due to the fact that it is a recent/emerging issue. However, as reflect of this concern, these two items have already been integrated into the MED POL list for beach marine items and the pertinent Data Standards (DS) and Data Dictionary (DD) of IMAP InfoSystem for IMAP EO10 Common Indicator 22.²³

Following a similar approach as in the EU, and in order to simplify and group similar items, as well as ease to communicate the relevant policy measures to the public, the following priority list of SUPs to be tackled in priority at the Mediterranean scale is suggested in Table 3. It is to be noticed that this list is for guidance purpose only, since a national assessment should be conducted to come up with a final list of priority items. For ease of understanding, short definitions as well as pictures of the items can be found in Annex I.

23 UNEP/MAP (2021). Addendum to the MED POL Beach Marine Litter Item List and their Data Standards and Data Dictionaries to include Two New COVID-19 Related Items (Single-Use Plastic Masks & Gloves). Meeting of the Ecosystem Approach Correspondence Group on Marine Litter Monitoring (CORMON Marine Litter). UNEP/MED WG.490/6.

Table 2
Mediterranean Top-10 SUPs found as beach litter items

RANKING	MEDITERRANEAN REGION
1	Cigarette butts and filters
2	Plastic caps and lids (including rings from bottle caps/lids)
3	Cotton bud sticks
4	Drink bottles
5	Crisps packets/sweets wrappers/Lolly sticks
6	Cutlery, plates and trays / Straws and stirrers
7	Shopping bags incl. pieces
8	Food containers incl. fast food containers
9	Cups and cup lids
10	Small plastic bags, e.g. freezer bags incl. pieces

Table 3:
Suggested Mediterranean priority list of SUPs per group of items

GROUP OF ITEMS	ITEMS
Packaging	Bags
Smoking-related	Cigarette filters
Food and beverage packaging	Drink bottles, caps and lids
	Crisp packets and sweet wrappers
On-the-go food and beverage packaging	Cutlery, plates and trays
	Straws and stirrers
	Drinks cups and cup lids
	Food containers including fast food packaging
WC flushed items	Sanitary applications, including cotton buds, wet wipes and sanitary towels
Personal protective equipment	Masks and gloves

3. POLICY OPTIONS TO TACKLE SUPs

3.1. REGIONAL POLICY FRAMEWORK FOR SUPs IN THE MEDITERRANEAN

Over the last decade, numerous countries around the globe have adopted measures to limit the negative impacts of SUPs, whether through very targeted instruments or overarching waste management approaches. In this regard UNEP commissioned A Global Review of National Laws and Regulations, which reviewed and mapped the status of legislation in 193 countries and classified the various forms of legislation.²⁴

In the Mediterranean, there are two key legal frameworks regarding marine litter management in the basin: The Barcelona Convention and the EU. Key instruments in addressing the topic are the Regional Plan on Marine Litter Management (RPML) in the Mediterranean and the EU Marine Strategy Framework Directive (MSFD) (where applicable). Under the Convention, the Article 9 of RPML includes provisions to address various SUPs through different measures (e.g. bans, economic instruments, voluntary agreements, etc.), and these provisions have been strengthened in the upgraded version adopted at COP 22. Mediterranean countries have implemented these measures to a certain extent and with different levels of success, particularly on single-use plastic bags, but further action and particularly to avoid littering of certain SUPs of concern shall be taken to contribute to the good environmental status of the Mediterranean Sea.

With regards to EU Mediterranean countries, there are a number of current and proposed EU Directives and action plans which require measures that can help tackle marine litter. This includes revised recycling targets in the Circular Economy Package, the Landfill Directive and the Directive on the reduction of the impact of certain plastic products on the environment (the SUPs Directive). However, Member States are at various stages of implementing or meeting these regulations.²⁵ As for the SUPs Directive, it includes a range of policy measures relevant for specific items, including market restrictions, consumption reduction, design, collection and labelling requirements

and Extended Producer Responsibility (EPR) schemes, depending on the type of item and on already available alternatives. The Directive applies to single-use items made of plastic, including bio-based and biodegradable plastics. The EU banned 15 items listed as per July 2021, and aims at a significant consumption reduction for food containers and beverage cups.

3.2. POTENTIAL MEASURES

As described in section 4, the selection of measures should be based on a country-specific SUPs baseline and policy objectives. Once this is defined, a variety of measures on a product-by-product basis shall be analysed, especially in terms of feasibility considering the availability of alternatives, and later adopted to achieve the desirable outcome. For this reason, these aspects are addressed in the following sub-chapters.

This section outlines a range of measures that can cover some or all of the different products. It is important to note that they could target not only SUPs but generally the single-use of the products, regardless of the material they are made of, and hence avoiding any potential trade-off. The measures listed hereunder are the most commonly applied, in increasing order of ambition:²⁶

- a. **Information campaigns.** Information campaigns could be targeted at consumers with a range of aims depending upon the nature of the item. For example, campaigns might a) aim to improve consumers' understanding of the impacts of littering with the objective of reducing litter rates, or b) aim to reduce the incidence of sanitary items flushed down toilets and drains, or c) focus on broader impacts of marine plastics, with the aim of encouraging consumers to take up available single-use non-plastic alternatives, or start using multi-use items, instead.

24 United Nations Environment Programme (2018). Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations. Available at https://wedocs.unep.org/bitstream/handle/20.500.11822/27113/plastics_limits.pdf.

25 The Information Document contains a summary of the European policy context in relation to SUP pollution.

26 Based on ICF and Eunomia (2018). Assessment of measures to reduce marine litter from single use plastics, Report for DG Environment, May 2018, https://ec.europa.eu/environment/waste/pdf/Study_sups.pdf. The order of the measures also can be read in a decreasing order of stakeholders' acceptability.

- b. **Voluntary agreements, voluntary commitments and pledges.** A range of measures which require no specific legal instrument could be taken directly by industry. Voluntary agreements (VAs) are generally those actions taken by industry to bring about changes without the need for changes in regulations. Voluntary commitments and pledges, on the other hand, might be made by individual companies, and are usually made independently.
- c. **Mandatory labelling.** Whilst information campaigns may have a general, population-wide character, mandatory labelling of widely littered items could help deliver messages more directly to consumers. The effectiveness of such a measure depends on how clearly the message is conveyed, and how much of an impact the message has on those who currently litter the labelled items.
- d. **Extended producers responsibility (EPR) systems, including litter clean-up costs coverage.** EPR is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products. Currently there are very few instances where, under extended producer responsibility, producers pay for the costs of clean-up of litter. Under the principle of EPR, the full costs of managing a product at end of life ought to be covered, and this might be assumed to include the cost of cleaning up any items that are littered on land and on beaches. This measure places that burden upon producers, such that those currently operating street, highway and beach cleansing services are compensated. Likewise, EPR's fees can be modulated in order to account for the differentiated impact of options, including the likelihood to be littered. EPR could also be applied to cover the costs of other measures such as information campaigns.
- e. **Specific requirements on product design.** Product design measures could be taken to reduce the propensity for certain items to be littered. For example, bottle lids could be tethered to bottles. Another potential design change could be to integrate straws into drinks containers, rather than selling such items separately. Evidence suggests that smaller items are less frequently collected in litter clean-up processes than larger items. The aim of any design measures, therefore, is to integrate smaller items with larger items such that littering is reduced.
- f. **Deposit Refund Systems (DRS).** DRS on one-way beverage containers provides a clear economic incentive for consumers to return their empty containers, including plastic bottles, to return points. Moreover, any bottles that are initially littered have a relatively high economic value, they are therefore picked up by others and returned, and so, ultimately, avoid ending up in the marine environment. In addition, DRS can be applied to on-the-go food containers and cups as well, whether as regulation or business practice.
- g. **Sales restrictions/ measures for adoption by public authorities, including green public procurement.** Public authorities have specific competences and influence that can be brought to bear in order to reduce the flow of SUPs into the marine environment. Some examples include permission to major public events or specific rules/restrictions in particular sites (e.g. beaches, Marine Protected Areas, small islands). In addition, they have significant spending power through their public procurement of goods and services.
- h. **Consumption levies.** 'Levies' are considered to be any economic instrument implemented at the country level that increases the cost of SUP items placed on the market, and incentivise non-use, or substitution by single-use non-plastic and multi-use items. However, it can be also applied to all single-use options to avoid increasing consumptions of other material products.



- i. **Bans.** This measure would see complete market bans on the sale of certain SUP items by a given year. However, as indicated in the measure above, the ban can target single-use items, regardless of the material.

It is to be noted that when considering the potential measures, waste hierarchy and circular economy principles should be followed. Hence, the measures should promote reduction and prevention in the first place, as a best strategy to abate waste and littering, as well as avoiding potential negative trade-offs.

3.3. ALTERNATIVES TO SUPs

The design of policy measures to eliminate or reduce the consumption of problematic SUPs must take into account the necessity for the item in question, and, where relevant, the availability of alternative products and systems to switch to. For example, where alternatives are widely available and accessible, or the consumption of the SUP item in question is for convenience only, a ban, or charge on the SUP item is likely to be suitable.

Different types of alternatives are to be considered, ranging from alternative business models, multi-use products (MUs), single use non-plastic alternatives (SUNPs), or different consumer behaviour. Annex II includes further information on alternatives per suggested Mediterranean priority list of SUPs.

It is noted that “biodegradable” plastic, or “bioplastic” alternatives, including bio-based plastics and compostable plastics are not considered credible alternatives for SUPs at present. This is due to widespread misconceptions regarding the options for their end of life treatment, which in reality, are limited and present no added benefit relative to SUPs, except in very few applications. Many reports document these issues, for example the Information Document, in Appendix A.2.0 (included in these guidelines as Annex III).²⁷ Important considerations to be made are:

- a. Irrespective of the material, these items are single-use which implies impacts in terms of production and littering.
- b. Infrastructure to manage bio-waste is needed, including collection and end-of-life treatment (e.g. industrial composting).
- c. The legal framework should require these items to be in conformity with biodegradable standards (e.g. EN 13432) to avoid false claims on biodegradability.
- d. Citizens must be informed and aware to separate these items at source, and yet, differentiation by the appearance is difficult and labels can be ambiguous.

- e. In composting facilities, products’ size and format can be a reason to be rejected as foreign material.

Single-use non-plastic (SUNP) products refer to items which are made from non-plastic materials though are still designed to be used in the same way as conventional SUPs (i.e. to be disposed of after one use). Products may include bottles, cups, cutlery, food dishes and other packaging. The materials used can include, though are not limited to, wood, cardboard, paper, bamboo, metal and glass. In general, it is noted that a direct switch from SUPs to SUNP items in the absence of any further incentive to change consumer behaviour is likely to have little to no impact on the issues of litter and waste generation. However, depending on the specific material chosen for a particular application, SUNP items may be easier to recycle if collected in formal waste management systems (e.g. packing paper for protection in place of polystyrene foam). Similarly, some materials may be associated with fewer negative impacts if landfilled or littered.

Multiple use (MU) products are those that are designed for more than one trip/rotation and can be made from any material. Examples include, but are not limited to, water bottles, food containers, reusable coffee cups, and metal straws. Generally, MU products are made of higher quality materials and are designed to last longer than single-use products, which increases the environmental impact of their manufacture and the cost of their production. If compared to similar SUPs items, their environmental performance will depend on the number of uses: the more those items will be reused, the more its environmental impact per use will be reduced. A key advantage of MU items is that, because of their reusable nature, they tend not to be discarded carelessly as litter, nor are they disposed of after just one use. This has significant implications for waste and litter prevention, as well as the avoidance of the negative environmental impacts associated with these relative to SUPs. A shift from single use plastics to MU alternatives will usually involve a change in business models, in particular, to reuse models to enable the uptake of these alternatives.

Among the available business models supporting circular economy,²⁸ the ones that are most relevant to the issue of single use plastic pollution are models of waste prevention (including reuse) and improved waste management. While improved systems for repair and refurbishment, as well as the development of sharing and leasing models are relevant to reduce plastic waste from other sectors, their scope for application in the packaging sector, and in particular for SUPs, may be limited. However, a number of reuse systems exist to encourage the uptake of the MU alternatives described above, although two reuse models are most relevant to on-the-go SUPs (specifically beverage bottles and food containers):

27 http://www.cprac.org/docs2/information_document_preparatio_of_guidelines_for_sups.pdf

28 More information about business models supporting circular economy can be found at the SCP/RAC paper “CIRCULAR ECONOMY BUSINESS STRATEGIES Conceptual Framework to Guide the Development of Sustainable Business Models”, available at: <https://www.theswitchers.eu/wp-content/uploads/2020/03/Strategies-for-the-Development-of-Circular-Economy-Business-Model-FINAL....pdf>

- a. **Consumer-led refill scheme:** this model involves that customers use their own packaging or a brand's refillable packaging in store, in hotel/restaurant/café (HORECA) establishments, at dispensing systems in vending machines or water fountains (for bottles). The consumer is responsible for cleaning the container. To encourage behaviour change in such systems, SUPs could still be provided in the short term where relevant, but at a cost to consumers, to ensure that they are incentivised, and enabled, to bring their own containers.
- b. **Industry-led return scheme:** this model enables users to return empty packaging either at a store or drop-off points to be collected, cleaned and refilled by the retailer or producer. Such systems can include deposit return schemes (DRS) to ensure the recovery of such packaging. When the product is part of a return scheme, reverse logistics and associated infrastructure are required to collect, clean and distribute products. A shift to reuse systems would ultimately require not only behaviour change by consumers, but could also place additional requirements on retailers, such as labour for cleaning refill dispensers and space for storage of returned containers.

eight meta-studies on LCA of single-use plastic products and their alternatives. A critical finding of this work is that “single-use” is more problematic than “plastic”. Therefore, Member States are encouraged to replace single-use plastic products with reusable products as part of a circular economy approach.²⁹

Although the analysis of alternatives should be country specific, based on the suggested Top-10 SUPs in the Mediterranean and overall situation in the region, the following table serves as indication on the availability of alternatives.³⁰

The environmental performance of alternatives in respect to SUPs has raised controversy over the last year. As requested by Member States, UNEP undertook the full life-cycle environmental impacts of single-use plastic products in comparison with their alternatives. For that, research focused on policy actions that have been informed by life-cycle thinking, as well as the results of

Table 4.
Degree of availability of alternatives for suggested top-10 SUPs.

ITEMS WITH NONE OR DIFFICULT ALTERNATIVE	ITEMS WITH SOME ALTERNATIVES	ITEMS WITH CLEAR ALTERNATIVES / CONVENIENCE USE
Cigarette filters	Food containers including fast food packaging	Sanitary applications (cotton buds)
Drink bottles, caps and lids	Drinks cups and cup lids	Cutlery, plates and trays
Crisp packets and sweet wrappers	Sanitary applications (wet wipes)	Straws and stirrers
Sanitary applications (sanitary towels)	Personal protective equipment (masks and gloves)	Plastic bags

29 United Nations Environment Programme (2021). Addressing Single-use Plastic Products Pollution Using a Life Cycle Approach. Nairobi. <https://bit.ly/2NuqwuM>

30 Adapted from EC (2018). COMMISSION STAFF WORKING DOCUMENT. IMPACT ASSESSMENT. Reducing Marine Litter: action on single use plastics and fishing gear. Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment. SWD(2018) 254 final. In the case of personal protectives equipment, it is considered that some alternatives exist in terms of reusable masks and consumer behaviour (washing hands).

3.4. FEASIBILITY OF MEASURES IN THE MEDITERRANEAN CONTEXT

Considering the need for and/or alternatives to SUPs, the degree of feasibility of measures in the Mediterranean in the product-measure matrix below can serve as reference, though a country-specific assessment is necessary.

- GREEN – High feasibility/experience
- YELLOW – Medium feasibility/low experience
- RED – Unfeasible/non-experience

Table 5. Matrix SUP item – feasibility of measures in the Mediterranean context

		Information campaigns	Voluntary agreements	Mandatory labelling	EPR – including litter clean-up costs coverage	Specific requirements on product design	DRS	Sales restrictions / measures for adoption by public authorities	Consumption levies	Bans
Smoking Related	Cigarette filters	●	●	●	●	●	●	●	●	●
Food and beverage packaging	Drink bottles, caps and lids	●	●	●	●	●	●	●	●	●
	Crisp packets and sweet wrappers (lids)	●	●	●	●	●	●	●	●	●
On-the-go food and beverage packaging	Cutlery, plates and trays	●	●	●	●	●	●	●	●	●
	Straws and stirrers	●	●	●	●	●	●	●	●	●
	Drinks cups and cup lids	●	●	●	●	●	●	●	●	●
	Food containers including fast food packaging	●	●	●	●	●	●	●	●	●
WC flushed items	Cotton buds	●	●	●	●	●	●	●	●	●
	Sanitary towels	●	●	●	●	●	●	●	●	●
	Wet wipes	●	●	●	●	●	●	●	●	●
Pack.	Bags	●	●	●	●	●	●	●	●	●
Personal protective equipment	Masks	●	●	●	●	●	●	●	●	●
	Gloves	●	●	●	●	●	●	●	●	●

3.5. ENVIRONMENTAL AND SOCIO-ECONOMIC EFFECTS

The proposed measures have different effects in terms of production, consumption and waste management, which in turn involves environmental and socioeconomic impacts.

The main environmental benefit of measures implementation is the reduction in plastic marine littering rates. However, other environmental parameters should be accounted to avoid unwanted trade-offs. This is often done through life-cycle analysis (LCA),³¹ looking at changes in resource use, greenhouse gas emissions and emissions of other pollutants, among others. In addition, changes in consumption directly affects the quantity of material at a given end destination. Hence the impacts of these changes shall be considered, including the environmental disamenities associated with changes in the quantity of litter.

Changes in consumption have a range of different economic impacts. As the market shares of SUPs, SUNPs and MUs items shift, some producers lose and some gain. In some cases, the measures are also likely to stimulate innovation, in terms of SUNPs and MUs equivalents. Businesses are also affected through changes in fees to any extended producer responsibility schemes, or other obligations such as specific mandatory labelling. The costs of managing the waste items are also important to be considered.

Measures have an effect on jobs, in terms of manufacturing, collection, recycling, mixed waste treatment, refill schemes (for MUs) and litter-clean up, among others. This effect is often positive, peculiarly in relation to collection, recycling and refill schemes.

In the Mediterranean, specific research was conducted to model environmental and socio-economic effects of certain measures in selected measures.³² It was found that DRS and EPR have a great potential to reduce plastic marine littering rates, and DRS the best performance in reducing GHG emissions. Concerning the economic impacts of the measures modelled, measures targeting consumption of SUPs (bans and consumption levies) can lead to either an increase or loss in sales, depending on the type of product that consumption is switched to. All measures lead to a loss for SUPs producers, and net gains are only made by producers where the increased turnover for producers of alternative products is greater than this lost revenue. The magnitude of producers fees both for DRS and EPR is important. However, overall economic costs are compensated by the benefits. DRS schemes have the most significant positive impact on employment.

Ban on e.g. single use food container and straws have also a positive effect due to the implementation of refillable take-away box schemes for food containers, as they require reasonably significant numbers of staff to operate them, in relation to collection and washing. This increase in jobs significantly offsets reductions in manufacturing jobs due to decreased net consumption.



31 Key elements can be found at United Nations Environment Programme (2021). Addressing Single-use Plastic Products Pollution Using a Life Cycle Approach. Nairobi. <https://bit.ly/2NuqwUM>

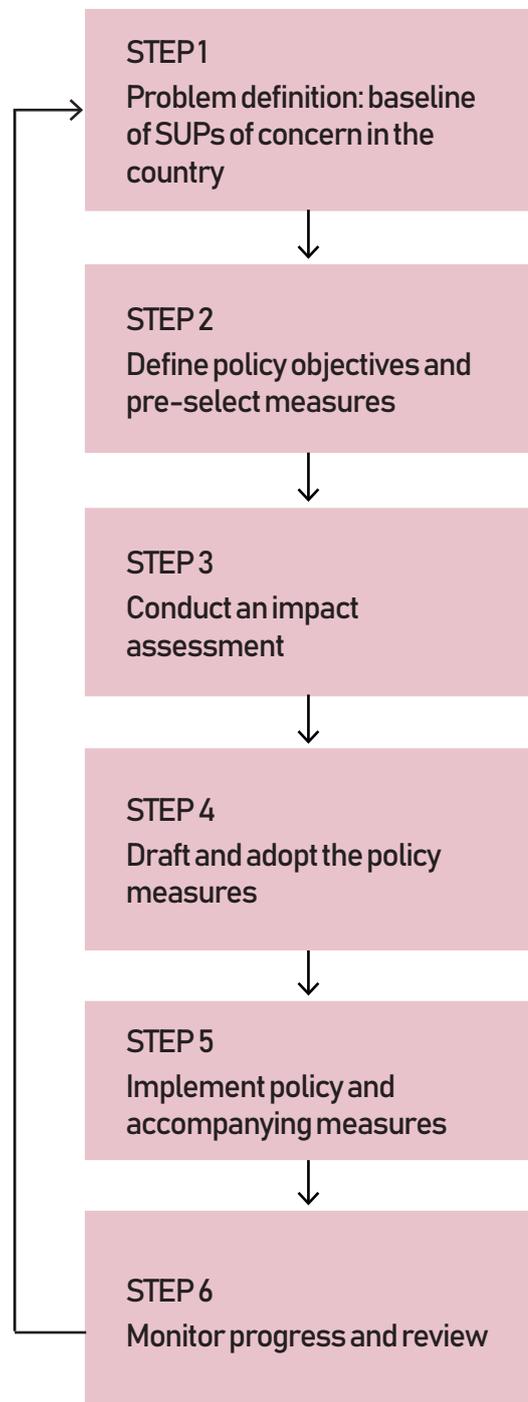
32 Eunomia (2021). Information Document for the preparation of guidelines to tackle single-use plastic items in the Mediterranean. Report for SCP/RAC. http://www.cprac.org/docs2/information_document_preparatio_of_guidelines_for_sups.pdf

4. ROADMAP TO TACKLE SINGLE-USE PLASTIC PRODUCTS IN THE MEDITERRANEAN REGION: A 6 STEP-BY-STEP APPROACH

Considering experiences in the Mediterranean region and beyond, sound solutions should be designed in a multi-dimensional, long-term perspective. A progressive, step-by-step approach should be adopted in order to ensure that:

- a. Governmental mechanisms are in place to monitor the production and consumption of SUPs, in order to review and adapt if the targets are not met.
- b. Economically/environmentally/technically sound alternatives are available, and the relevant standards and norms are in place to ensure the use and production of safer alternatives.
- c. Relevant industry has time/incentives/access to technology to reconvert, without major jobs/revenues loss.
- d. Incentives for the development of new technologies are in place for green entrepreneurs and businesses willing to put new alternatives on the market.
- e. Consumers are aware of the impacts of their behaviour, and are incentivized to modify their consumption patterns.
- f. The waste management system in the countries is adapted to accompanying the shift of products. First, it is important that collection/recycling rates improve, and unsound disposal is avoided. Later, the waste management system may need to adapt to the new alternatives introduced in the market, such as compostable items.

Therefore, the following 6 steps are suggested to tackle SUPs in the Mediterranean region in a progressive and comprehensive manner. Countries that already implemented measures in this regard may find complementary and supportive actions:



4.1. ACQUIRE A BASELINE ON SUPs AND POTENTIAL EFFECT OF MEASURES (STEPS 1, 2 AND 3)

STEP 1: PROBLEM DEFINITION: BASELINE OF SUPS OF CONCERN IN THE COUNTRY

Although section 2 of the guidelines indicates a list to SUPs of concern at Mediterranean level, it is highly recommended that each country conducts its own assessment, or to corroborate the regional priority. For that, a good starting point may be to verify SUPs often found as marine litter in the country, followed by data and information gathering as explained below.

In doing the assessment, countries should map sources and pathways to understand the problem and explore potential measures to address them. At this stage it is also important to find out about current and potential alternatives to SUPs, given the national context. In order to understand the extent and nature of SUPs consumption and waste generation, as well as in relation to alternatives, data should be sourced. Although some data may be held by national authorities such as customs administration, it is often scarce and additional research may be needed by surveying e.g. producers' associations. This research is also useful in terms of engaging stakeholders in the process and anticipating potential implementation challenges or public backlash. Acquiring these data and information is key to explore potential impacts of policy measures, as explained in step 3. Important information that shall be gathered, both for SUPs and alternatives, include:

- a. Production and imports, including growth rates
- b. Littering per capita
- c. Percentage of products in litter composition
- d. Recycling rates
- e. Residual waste destinations, including landfill, incineration and in formal disposal

In addition, current or planned policies and regulations having an impact on the selected SUPs should be acknowledged. This would constitute a business-as-usual future scenario (BaU) that shall be compared with future scenarios considering the implementation of potential measures.

The Information Document accompanying these guidelines explain the details of this first step, including data in four Mediterranean countries (i.e. Egypt, Greece, Montenegro and Morocco). Notwithstanding, it is worth mentioning other methodologies and experiences, such as the National Guidance for Plastic Pollution Hotspotting and Shaping Action, which provides a structure for the methods of identifying plastic leakage 'hotspots', finding their impacts along the entire plastic value chain, and then prioritising actions once these hotspots are identified.³³ The methodology has been implemented in a number of Mediterranean locations, including Cyprus and Menorca.³⁴

STEP 2: DEFINE POLICY OBJECTIVES AND PRE-SELECT MEASURES

On the basis of the assessment, countries shall decide what they wish to accomplish in relation to plastic pollution, and particularly SUPs, and including targets to the extent possible. The definition of measures should be aligned with international commitments, including those within the Barcelona Convention. Although this depends largely on the national context, some specific objectives may be pursued, which would determine the best possible measures to adopt.

³³ The report was launched in 2020 and co-developed by UNEP, IUCN and the Life Cycle Initiative: <https://www.unep.org/resources/report/national-guidance-plastic-pollution-hotspotting-and-shaping-action>

³⁴ <https://www.iucn.org/news/mediterranean/202102/cyprus-and-menorca-monitor-local-plastic-leakage-a-first-step-abate-plastic-pollution>

Considering the described policy options, the table below indicates this correlation, including the degree of appropriateness.

Table 6. Matrix policy objectives – adequacy of measures

	Reduction in consumption of SUP items	Improved recycling rates	Reduction in littering	Increased litter collection	Raise public funds (by pricing in externalities)
Information campaigns	+	+	+	+	
Voluntary agreements	+	+	+	+	+
Mandatory labelling		+	+	+	
EPR - including litter clean-up costs coverage		++		+++	+++
Specific requirements on product design		++	+++		
DRS for beverage containers		+++	+++	+++	
Sales restrictions / measures for adoption by public authorities	++	+	++	+	
Consumption levies	++		++		+++
Bans	+++		+++		

Thus, several measures could be combined to lead to a particular objective, and they could be simultaneously or progressively adopted and implemented. For example, if the objective is to reduce the consumption of plastic straws, first thing could be a voluntary agreement with food services, by which they would only deliver them upon request. This can be combined with an information campaign to reduce that request. At a later stage, a consumption levy or ban could be applied, particularly if targets are not met. In addition, a particular sale restriction could be adopted in sensitive areas such as beaches and islands. At this stage, a pre-selection of measures should be made in order to explore their potential effect (Step 3) and then agree on a final set of measures.

The issue on SUPs shall not be regarded as a stand-alone policy, but it shall be integrated within country-wide policies on waste management, sustainable consumption and production, circular economy or alike, with which policy objectives should be complimentary. In addition, this would serve to maximize the benefits of addressing SUPs in line with other policies (e.g. support to the development of sustainable businesses³⁵), and avoid any potential contradictory policy.

STEP 3: CONDUCT AN IMPACT ASSESSMENT

Ideally, the potential environmental and socioeconomic impact of the pre-selected measure should be conducted, in order to inform policy makers for sound decisions. A comprehensive way of doing so is through a cost-benefit analysis, which allows for a quantitative assessment. Baseline projections should be done considering a horizon year, hence including the projected impacts of already firmly planned policies on SUPs consumption and waste

³⁵ A list of policy recommendations to support the development of green and circular businesses in the Mediterranean was developed for the preparation of a related set of regional measures in the context of the Barcelona Convention. It also considers SUPs related measures. Available at this link: https://switchmed.eu/wp-content/uploads/2020/12/SwitchMed_Regional-Summary-of-Policy-Recommendations.pdf

management. Next, modelling assumptions should be made about the costs and impacts of different measures. As a result, each measure will show a particular impact concerning production, consumption and waste management, as described in section 3.5. These impacts can be aggregated to obtain a final impact estimation of the policy intervention. However, these models need for important assumptions that should be acknowledged, and qualitative assessments may be complimentary. In the event of lack of data, capacity or budget, the latter may be the only option. In this case, a qualitative assessment of the impacts may be done expressing the magnitude of environmental gains, of costs and benefits, and how they are distributed across stakeholders.

This assessment should account for the impact on particular social groups, such as women or informal sector, often misrepresented but with an important role on SUPs. For example, women are directly concerned by sanitary products, in terms of convenience, culture and price (e.g. sanitary towels), and waste-pickers fully depend on the collection of valuable waste material (e.g. PET bottles).

STEP 4: DRAFT AND ADOPT THE POLICY MEASURES (4.2)³⁶

There are different regulatory approaches when tackling individual SUP or a group of SUPs. As explained in Step 2, an overarching strategy or framework legal instrument may allow for addressing them in a comprehensive manner and in the long term. However, in some cases this may require extensive policy making processes. In any case, some considerations are important to be made:

- a. Different measures can co-exist and may bring better results than isolated measures. For example, in case of a ban on certain SUP, a complimentary consumption levy on other single-use options may prevent a simple switch to other materials. Instead, reusable options would be favoured. This is of utmost importance, since a key objective should be reducing “single-use”, regardless of the material/format.
- b. A progressive approach where different measures are applied on SUPs is advisable, to allow for consumers and businesses buy-in without major market and social disruption. This may start with soft policies such as information campaigns and voluntary agreements, which do not require a regulatory process.
- c. Grouping certain SUPs per source and pathway permits addressing various SUPs through the same kind of measure e.g. a consumption levy on on-the-go items or mandatory labelling on sanitary products.

- d. Policies should be aligned at different geographical levels, from local to national, to complement actions from authorities with different competences. This allows for maximizing synergies and scaling up success initiatives.

Regardless of the chosen instrument, policy-makers and legislators should adopt a long-term approach and foresee by-laws for specific matters such as allowing for exceptions or promoting alternatives, often based in standards and labels (see in Step 5 – Ensure a level playing field: standardization and labelling).

Consulting concerned stakeholders as well as the general population is key to gain additions to the process and avoid opposition in the implementation stage. This can be done through different options, such as surveys (including online) and stakeholders’ group discussions. To note that in contexts where informal sector has an important role (e.g. waste pickers), efforts should be placed to bring them on board through their representatives. The same applies for particular social groups (e.g. women, disabled people) who may bear negative impacts. It is important to provide solid basis for a discussion, including draft legislations and research reports. In addition, is a good practice that governments provide feedback to the entities and people participating in the consultation process, explaining how the elements were taken into account and justifying why some others were not.

Defining precisely the scope of the regulation is key for proper understanding by all parties and avoidance of law by-pass, particularly in the case of bans and consumption levies. It must be considered that in most of the cases the product as such is not the target but the material or the format. For example, in the case of cups, the target could be a material such as expanded polystyrene, or in the case of bags, it may refer to the format (thickness/grammage and/or volume). In addition, the instrument should clearly refer to the affected activities, which may be the production, distribution or free delivery of the product. Finally, exceptions should be clearly defined as well as alternatives, if a particular one is to be favoured.

Transparency is a key element in good governance. In the case of SUPs, it is particularly important in relation to economic instruments such as consumption levies or subsidies. Legislation should clearly define who and how is involved in the management of the funds. Another important element relates to records of SUPs consumption, which can be ensured through a registry of producers or Producer Responsibility Organisations (in the framework of EPR).

Other important elements in legal drafting include the considerations of different implementation periods to enable a progressive approach, designation of control and surveillance bodies, reporting and non-compliance penalties.

36 For more information, the UNEP legislative guide for the regulation of Single-Use Plastic Products provides additional insights and examples (pp. 6-12). <https://wedocs.unep.org/bitstream/handle/20.500.11822/34570/PlastPoll.pdf.pdf?sequence=3&isAllowed=y>

STEP 5: IMPLEMENT POLICY AND ACCOMPANYING MEASURES (4.3)

A well thought, robust policy regulation may fail in the absence of a proper enabling environment. SUPs is a transversal issue, requiring of multiple cross-sector actions, and not exclusively from the regulation perspective. Thus, multiple actions are needed to ensure stakeholders' engagement and buy-in, maximize the positive effects, and limit socioeconomic negative effects.

For that, the "SUPs related regulation" adopted by the competent national authorities might need to be complemented by additional measures (accompanying measures) in order to ensure its effective implementation. They can be regulatory measures such as by-laws, but also other kind of measures such as inter-governmental settings or funding programmes. Main categories of measures in relation to SUPs follow:

- a. **Information, awareness and education.** Even if information campaigns can be considered as a measure in itself, they should be an intrinsic part of any other policy measure. In fact, both businesses and consumers should have a good understanding of the scope and implication of SUPs measures, which can be a very sensitive issue. Since they play an important role in our daily life. For this reason, it is important to actively communicate and engage citizens and stakeholders in any policy being made at this regard. This communication could be based in the positive effects of switching towards reusable options, for example in terms of social wellbeing or money savings, compared to continuous SUPs purchase, rather than on general messages on the negative effects in the environment. Information and communication should be carefully designed to shift behaviour to sustainable consumption. A recent report by the Stockholm Environment Institute, provides remarkable insights about communication campaigns that have proven to be successful in tackling plastic pollution.³⁷

Education has a key role to play, not only in raising overall environmental awareness, but also to build solid technical capacity to address sustainable consumption and production, including in relation to SUPs. For this, sustainability issues should be further included in academia curriculum of studies such as chemical engineering, industrial design or food processing. In addition, civil servants would benefit from

vocational training and exchange of experience with fellows.

- b. **Enhance overall waste management.** Although figures vary widely across the region, additional efforts are needed to improve solid waste management in the countries, which would have a direct and indirect benefit in relation to SUPs. First, policy and practice should better address waste reduction at source, applying the following waste hierarchy as a priority order in waste prevention and management legislation and policy: reduction, prevention, preparing for re-use, recycling, energy recovery and environmentally sound disposal. For this, key elements are to be accomplished including building capacity of waste management operators, sustainable financing schemes and proper implementation of economic incentives (e.g. tax on landfilling).

Waste collection should be improved, particularly in coastal areas and waterways. More specifically on certain SUPs, separate collection at source remains a challenge and a great barrier in improving recycling rates in the countries. In the Southern Mediterranean, most of this activity falls in the informal sector which results in low quality of recyclable material and deplorable socioeconomic conditions for workers, including children. The implementation and/or enhancement of EPR schemes, particularly for food and beverage packaging, should alleviate this issue by properly integrating the informal sector. EPR, especially if designed to encourage prevention and including the cost of litter recovery and management, may have one of the most positive results in reducing plastic litter across the countries.³⁸

In addition, there is a need for further extraction of recyclable materials from the mixed/residual waste stream prior to disposal/recovery as well. Considering high reliance on landfill, priority should be given to ensuring maximum recycling rates in the existing and planned waste treatment (e.g. mechanical biological treatment plants)/recycling infrastructure in those countries with the aim of reducing residues (and plastics) to landfill.

It shall be noted that even if SUPs are eradicated, reusable alternatives are often made of plastic (polypropylene, nylon, etc.), and thus their collection and recycling should be promoted to avoid improper disposal. The same applies for single-use non-plastic product alternatives. Hence, alternatives should be promoted following eco-design principles, particularly considering end-of-life stages.

³⁷ This report examines the relevant literature on behaviour change, psychology and environmental issues to learn which strategies can be effective – and which might be counterproductive – when it comes to shifting people's actions around plastic. From the review of scholarly articles, media reports and surveys of the public, emerges a number of recommendations that can be put to use by anyone creating a campaign concerned with plastic use. More information at:

<https://www.oneplanetnetwork.org/resource/reducing-plastic-pollution-campaigns-work>

³⁸ To note that specific guidelines and tools of EPR are available, such as the EPR Toolbox

<https://prevent-waste.net/en/epr-toolbox/>, developed by PREVENT Waste Alliance, and tackling particularly developing countries.

If compostable SUPs are regarded as a preferred alternative (despite the observations made in chapter 3.3), the system should evolve to collect and treat bio-waste separately. Given the high organic waste proportion in many countries in the region, pilot projects on domestic and industrial composting could be implemented to assess the feasibility to extend the system. This should be regarded as a necessary condition before legally promoting compostable alternatives.

- c. **Ensure inter-governmental coordination.** Although the main regulatory instrument may originate from the national authority responsible for the environment, implementation and enforcement will require the action by other sectoral and geographical scale administrations. At the national level, it will be necessary to ensure a good coordination between authorities responsible for environment, industry, commerce, internal affairs, economy, finance and customs. For example, the ministry of finance or industry may take the role of controlling fraud whereas the ministry of economy could set up a funding programme for the adaptation of the private sector. This coordination shall ideally be ensured by the cabinet of ministers. National agencies (e.g. environment, waste, statistics) shall also have an important role in the implementation phase, particularly in terms of gathering data for monitoring and information.

Additionally, sub-national authorities can have a key role according to their competences given the national context. This should be accounted and coordination ensured e.g. through an ad-hoc steering committee. Finally, governmental bodies would benefit from exchange with their homologue institutions in other countries, as well as from international co-operation programmes.

- d. **Ensure a level playing field: standardization and labelling**³⁹. Product standards, certification and labelling can be designed to target sustainable alternatives to SUPs or to mitigate the negative impacts of single-use plastics. This may relate to material composition (e.g. recycled content) or to features such as recyclability, reusability, compostability and biodegradability, which can inform on consumer safety, environmental protection or product design. It is important to distinguish between those which are mandatory by law and those which are voluntary and may serve to inform consumers. In case they are mandatory, the legal instrument providing for that should encompass what labels or marking on products are required, how compliance will be verified and by which authorities or entities. In fact, this is considered as a policy measure on its own,

and for example in the EU SUPs Directive is applied in products such as wet wipes and sanitary items.

Likewise, there are three additional important aspects to be considered in relation to marking of SUPs:

- Labelling regarding biodegradable products: there is the risk that certain labelling is used as greenwashing and mislead citizens. This is the case of certain products being marked as biodegradable without any reference to international standards. Although as explained in section 3.3 compostable/biodegradable plastics are not considered as suitable alternatives to SUPs, marking of compostable products should include recognized labels and reference to international standards (e.g. EN 13432) to avoid false claims on biodegradability. In order to check the compliance with standards and norms, countries should ensure that appropriate human and technical resources are available to test biodegradable plastics.
 - Feasibility of end-of-life treatment options: another issue may be found in products marked as recyclable, which does not necessary imply that this will be the case in practice, since this depends on the local situation of waste management (separate collection, sorting, availability of recycling facilities).
 - Inclusion of recycled plastic content: the use of recycled plastic in products should be promoted cautiously since it may include contamination through additives.⁴⁰ Thus, quality standards for sorted plastic waste and recycled plastics are being promoted, both for consumers' safety and to boost industry confidence in the quality of recyclable or recycled plastics.
- e. **Promote collaboration across the value chain.** Given the need to approach plastic pollution holistically, system-thinking approaches have remarkably grown over the last years. For this, the first thing would be to map the stakeholders involved in the plastics sector and those which use this material in bigger quantities (e.g. packaging). The aims of the collaboration may be varied, but should include actions to improve synergies/coherence between design, production, consumption, collection and recycling. In this regard, producers' responsibility organisations, where they exist, play a key role in facilitating these connections. Hence this collaboration may lead to products which are more durable, repairable or recyclable (e.g. mono-polymer products). Governments and non-governmental organisations have an important role in terms of steering the process and ensuring transparency.

39 More information on these aspects can be found at the UNEP legislative guide on single use plastic products (pp. 31-36) at <https://wedocs.unep.org/bitstream/handle/20.500.11822/34570/PlastPoll.pdf.pdf?sequence=3&isAllowed=y>

40 This issue is addressed in SCP/RAC and IPEN (2020). Toxic Additives in Plastics: Hidden Hazards Linked to Common Plastic Products. http://www.cprac.org/docs2/plastics__additives_-_final_-_english_-_high_0.pdf

f. **Provide incentives to industry and entrepreneurs.** This is especially important in the case of bans, but also in the case of other measures having costs on producers and distributors. However, it is important to note that in many countries it has been considered that industry has the capacity to adapt without state aid, also considering that many SUPs are imported from foreign countries. On the contrary, action on SUPs is often regarded as an opportunity for developing the internal market. Eco-taxes could provide the funds for these incentives, and innovative business models based on reuse could be supported to promote MUs alternatives.

Opportunities and guidance should be given to switch SUPs producers to durable plastic applications or other product materials. Once the priorities have been set to promote sound alternatives to SUPs, options for upgrading their production capacity include: tax rebates, research and development funds, technology incubation, public-private partnerships, and reduction/abolishment of taxes on the import of material used to make alternatives, among others.

In the case of important presence of informal economy in relation to SUPs (e.g. illegal producers, waste-pickers), it should be accounted and support them to switch or formalize their activity. A public funded programme could be established to frame them in legal operative structures (e.g. waste management cooperatives) or offer alternative income opportunities such as grouping in cooperatives and training on the production of alternatives.

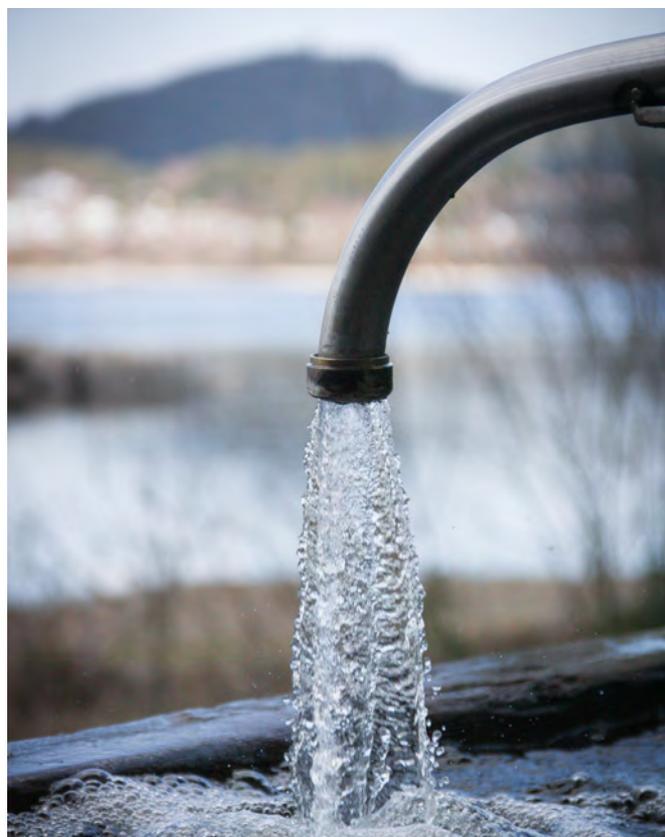
g. **Implement nationwide potable water/refill systems.** In order to reduce the consumption, waste and litter associated with on-the-go single use plastic bottles, particularly during the tourist season, this measure proposes nationwide expansion of existing programmes that focus on the development of refill networks and access to public drinking water, such as water fountains. On a larger scale, this includes improvements in existing potable water systems to eliminate the need for plastic water bottles for domestic consumption.

STEP 6: MONITOR PROGRESS AND REVIEW (4.4)

All policy measures should include a monitoring system to know how the production, consumption, collection and end-of-life treatment of SUPs and their alternatives evolve over time. For example, SUPs producers may be required to report in a given time period about the production and destination of their products, through the establishment of a registry of producers. These provisions are often part of the policy instruments, particularly in the case of consumption levies. If collection and recycling targets are adopted, robust information systems are key to monitor progress, as well as for surveillance of proper implementation of EPR schemes.

Being the reduction of plastic litter the ultimate objective, marine litter monitoring may inform whether this is achieved. For that MED POL – UNEP/MAP information system, in collaboration with the Contracting Parties, can provide updated information.⁴¹

Based on monitoring systems, if the objectives are not met, a review should be made to improve implementation or adopt additional measures.



41 Latest information on marine litter monitoring can be found at: MED POL – UNEP/MAP (2021). Updated Baseline Values and Proposal for Threshold Values for IMAP Common Indicator 22. Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation (CORMONs). UNEP/MED WG.482/23/Rev.1

ANNEX I

DEFINITION OF PROPOSED

SINGLE-USE PLASTIC PRODUCTS

TO BE TACKLED IN PRIORITY

IN THE MEDITERRANEAN REGION

This annex intends to provide a general, visual explanation about the products and items identified as a priority in the Mediterranean region. The information and images come from the EU MSFD Competence Centre (<https://mcc.jrc.ec.europa.eu/main/photocatalogue.py?N=41&O=457&cat=all>), unless otherwise cited.





CIGARETTE FILTERS

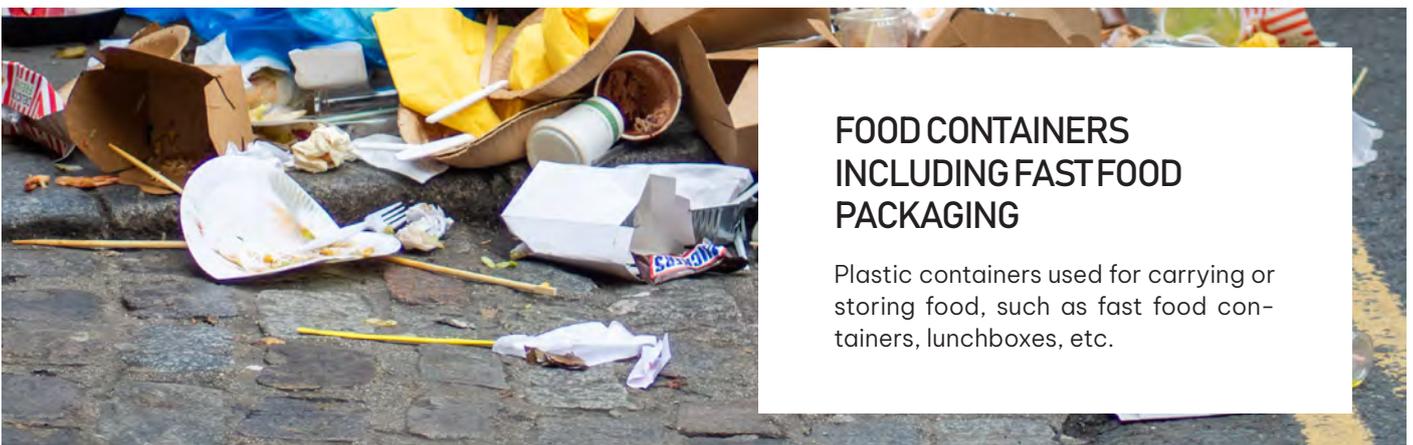
A cigarette filter, also known as a filter tip, is a component of a cigarette, placed at the one tip of the cigarette in order to absorb vapours and accumulate particulate smoke components. The filter is commonly made from synthetic plastic cellulose.



BAGS

Shopping bags are medium-sized bags, typically around 10-20 litres in volume (though much larger versions exist, especially for non-grocery shopping), that are used by shoppers to carry home their purchases. Shopping bags can be made with a variety of plastics.

Small plastic bags refer to small-sized bags such as freezer bags, zip-lock re-sealable food bags, poly bags, etc.



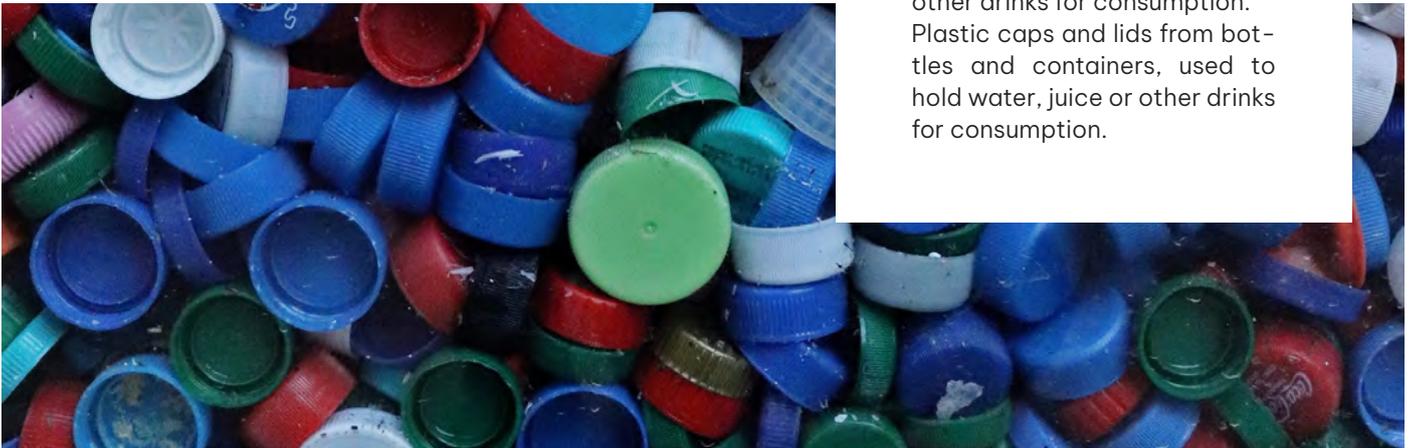
FOOD CONTAINERS INCLUDING FASTFOOD PACKAGING

Plastic containers used for carrying or storing food, such as fast food containers, lunchboxes, etc.



DRINK BOTTLES, CAPS AND LIDS

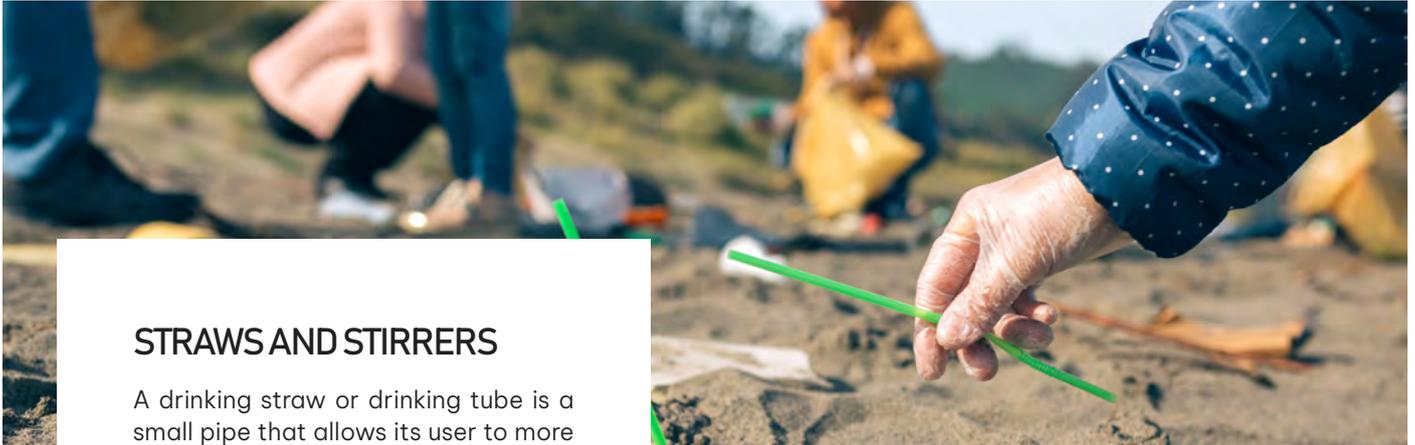
Plastic bottles and containers used to hold water, juice or other drinks for consumption. Plastic caps and lids from bottles and containers, used to hold water, juice or other drinks for consumption.



CRISP PACKETS AND SWEET WRAPPERS

Plastic food packets and wrappers created and designed in various colours, materials, shapes, sizes and styles for crisp food products (i.e. potato chips, etc.) or sweets (i.e. chocolates, candy, ice-creams, etc.).





STRAWS AND STIRRERS

A drinking straw or drinking tube is a small pipe that allows its user to more conveniently consume a drink.

Stirrers are used when serving hot drinks such as tea and coffee or other drinks such as cocktails.



CUTLERY, PLATES AND TRAYS

Single-use knives, forks, and spoons. Single-use plates and trays made of artificial polymer material





DRINKS CUPS AND CUP LIDS

Single-use cups and their lids for coffee and other drinks. They have a wide range of uses in restaurants, bakeries, or catering settings.



MASKS AND GLOVES

Single-use facemask used to protect against for example dust, chemicals and pathogens (e.g. COVID-19 pandemic).

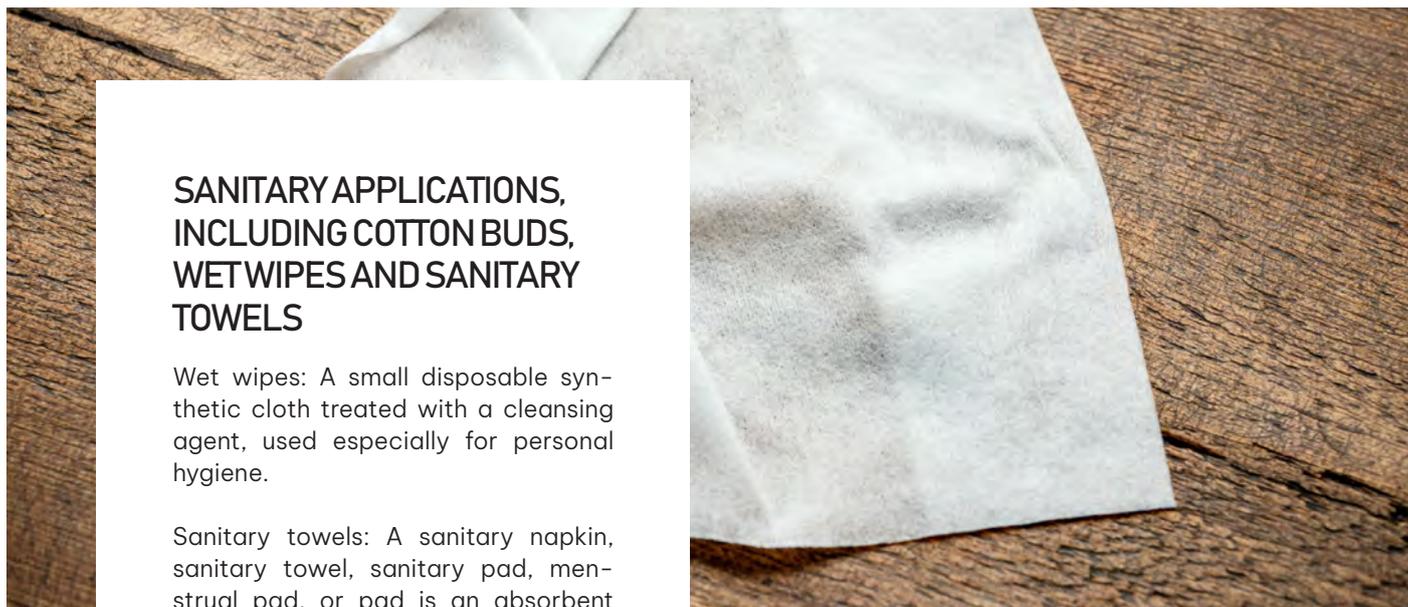


SANITARY APPLICATIONS, INCLUDING COTTON BUDS, WET WIPES AND SANITARY TOWELS

Wet wipes: A small disposable synthetic cloth treated with a cleansing agent, used especially for personal hygiene.

Sanitary towels: A sanitary napkin, sanitary towel, sanitary pad, menstrual pad, or pad is an absorbent item worn in the underwear to absorb a flow of blood.

Cotton buds: A short plastic stick with a small amount of cotton on each end that is used for cleaning, especially the ears. The cotton is usually no longer attached. The ends are rough when touched, where the cotton was attached. This feature can be used to separate from lolly sticks.



ANNEX II

POTENTIAL ALTERNATIVES

TO PRIORITY SINGLE-USE

PLASTIC PRODUCTS IN

THE MEDITERRANEAN REGION



This Annex provides an overall explanation of potential alternatives to SUPs, as it was published by the EC in the SUP Directive Impact Assessment,⁴² with the exception of plastic bags and personal protective equipment.

PLASTIC BAGS⁴³

There are numerous alternatives, including:

- a. Kraft paper bags in shops and for products which are relatively light. For example, in pharmacies (promoted in Tunisia) or for spices.
- b. Bag-for life in supermarkets and smaller shops. These bags are made of LDPE that can be bought and used many times, usually one that the supermarket replaces when it is broken and then recycles. There are standards develop for this kind of bags such as in Spain the UNE 53942 which establishes several parameters such as a minimum width of 30 microns, which allows at least 15 times use.
- c. Woven and non-woven polypropylene bags (or others such as nylon and polystyrene bags). This option is very suitable to be sold in supermarkets, and they can be reused later at smaller grocery shops. In Ireland, non-woven bags are now by far the preferred bag by consumers, chosen by 66% of those surveyed as their bag of choice.
- d. Recycled multi-use plastic bags. Reusing conventional and other plastic bags to produce reusable bags are a good option to raise awareness on the issue, while taking advantage of existing material.
- e. Baskets. This is a traditional option in MENA countries that could be fostered in specific shops like souvenirs stores, airports, etc. It can be marketed as a responsible option from which local population benefit.
- f. Shopping trolleys. This option allows replacing many bags and it can be an opportunity to develop local industry.
- g. Compostable bags. Although they have been promoted as an alternative, careful considerations are to be made as for the end-of-life treatment and false claims.

CIGARETTE FILTERS

Plant-derived cellulose filters could be used as an alternative, such as the RAW Biodegradable Slim Filter Tips, although according to anecdotal evidence the draw is not

exactly the same as normal plastic based filters. However, there may be room for innovation. Additionally, it has been argued that cigarettes should be sold without filters (such as filterless Gauloise-type cigarettes), as the filters do not have a demonstrable effect on health outcomes. Given that these could then be used with re-usable filters, this maintains choice for consumers.

DRINK BOTTLES

Networks of water fountains in cities, tourist areas and at beaches (or any other high traffic area) can be installed, along with running of information campaigns, in order to avoid the need for bottles at all. Fountains are available in most cities, but not at the level of density where consumers can quickly find them.

To enable and encourage consumers to use refillable bottles, mobile applications can be developed to indicate to consumers where the nearest available refill points are, to ensure they are used. Producers could install soda machines for use with refillables bottles, rather than selling single use plastic bottles. Consumers would then bring refillable bottles to the outlet and purchase the volume of drink they require for their bottle. Food and drink retailers can sell water from refillable bottles, rather than selling single use plastic bottles. Many small cafes take this approach already and do not sell plastic water bottles at all.

COTTON BUD STICKS

There are companies that produces reusable sticks for cleaning ears, which are according to the supplier are more efficient and safer than cotton buds. In fact, many medical professionals do not recommend the use of cotton buds. Alternatively, paper stemmed (single use) and wood substitutes are now commercially available and indeed are the market norm in eg the USA.

WETWIPES

Non-plastic alternatives to wet wipes used for personal care, for example make-up removal, already exist in the form of cotton pads or balls. Moreover, reusable alternatives to using wet wipes could include washable handkerchiefs or specially designed wipes, such as washable

42 EC (2018). COMMISSION STAFF WORKING DOCUMENT. IMPACT ASSESSMENT. Reducing Marine Litter: action on single use plastics and fishing gear. Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment. SWD(2018) 254 final.

43 SCP/RAC (2019). Background elements for the guidelines on phasing out single-use plastic bags: review of international experiences and alternative options. UNEP/MED WG.466 Inf.5

cloth Baby Wipes. Lotions (such as soaps, anti-bacterial gels, or make-up removal creams) could be applied to these wipes to achieve the desired result.

SANITARY TOWELS

Non-plastic alternatives for sanitary towels are not currently known. However, reusable sanitary towels, sanitary pads or menstrual pads are already available from a number of producers. These items are washable and reusable, and are usually made entirely of cotton, or of a mix of cotton or bamboo fibre with a waterproof poly-urethane layer.

CUTLERY

Currently, there are 2 different situations where single use cutlery might be used, where food and drink establishments provide them to customers:

- use on the premises, mainly to save costs of washing reusable cutlery; or
- taking out with food which cannot be hand eaten for consumption on the go.

The latter is the most relevant to littering, whereas both relate to over-consumption of material.

Metal cutlery is the clear alternative and the majority of establishments make use of this approach. Therefore, washable items should be implemented for all eat-in sales. For take-out sales, reusable cutlery could be a clear alternative if consumers brought their own, and knew which outlets allowed this.

If single use items are necessary, then wood alternatives could be used, and are very common already through large stockists.

STRAWS AND STIRRERS

For many drinks, straws and stirrers are not needed at all, and could be eliminated, especially if certain drinks containers with detachable straws could be adapted to include integrate drinking spouts etc. Re-useable straws and stirrers are also available made out of glass or metal. Another option could be to innovate packaging design to build-in 'straws' to the pack itself, rather than have a separate disposal straw that could be littered.

If consumers found some disposable option necessary, wooden stirrers are commercially available. For straws, paper or bamboo alternatives are also very common and highly available.

DRINKS CUPS

Currently, there are 2 different situations where single use drinks cups might be used, where food and drink establishments provide single use cups to customers:

- drink on the premises, mainly to save costs of washing reusable cups; or
- taking out drinks for consumption on the go.

The latter is the most relevant to littering, whereas both relate to over-consumption of material.

Crockery is a clear MU alternative and many establishments already make use of this approach.

Take-away beverage sales for consumption on the go can readily be sold in reusable cups, which are now very well known. Moreover, some enterprises are also offering reusable cup clubs, which collect and return them to retailers. The Freiburg Cup scheme is a city based scheme that has been piloted along these lines, with 72 venues participating as of March 2017. The cup has a €1 deposit associated and it can be returned to any participating venue. At least 14,000 cups are in use. Deposit refund arrangements for ceramic mugs can also often be found in markets.

For customers where a reusable cup is not an option, then any single use beverage containers should be plastic free. Some paper cups that are classified as compostable, have a water proof layer as they are lined with plant-based Polylactic Acid (PLA). However, composting is only likely to work under industrial conditions, and the plastic may not fully degrade under other conditions – such as the marine environment. Consequently, SUNP alternative is not included in the analysis as lined cups are required for coffee to ensure the mechanical strength is maintained even when filled with very hot liquid for a certain length of time.

Regarding the lids, the design of the coffee cup itself could be changed to integrate a sipping spout, eliminating the need for separate lids altogether.

FOOD CONTAINERS

Currently, there are 3 different situations where single use food containers might be used, where food establishments provide single use containers to customers:

- to eat the food on the premises, mainly to save costs of washing reusable containers or plates;
- collecting food for consumption at home; or
- taking out food for consumption on the go.

The latter is the most relevant to littering, whereas all relate to over-consumption of material.

Crockery is a clear MU alternative and the majority of eat in establishments make use of this approach already. Eating take-away food on site might not always be possible with crockery, but reusable containers would be an obvious alternative (washable tiffins or multi-compartment trays).

For food markets and portable take-away outlets, portable washing stations can be hired to undertake the task of washing the reusable containers customers use to eat the food. In 2011, Vienna introduced an obligation to use reusable items at events with more than 1,000 people, where more than 500 people are attending in venues recognised as “permanent” by the Viennese Municipality, or which are held on property owned by the Viennese Municipality.

Alternatively, companies could provide a reusable container service to the street vendors: some companies do this, and each box can be used up to 2-300 times before it is eventually recycled. However, to ensure a high return rate for the boxes, a deposit refund type scheme might be needed.

For at home consumption of take-away meals, reusable containers can be used. These are already widely used in environmentally focused establishments, rather than single use plastics containers which are used by the majority. Consumers can purchase a metal tiffin, for example, for around €15-20 and take this to the takeaway outlet when they go to pick up the meal. They then wash it at home ready for the next visit. Or they could just bring a regular Tupperware-type box.

Where consumers are visiting take-away outlets and want to eat out ‘on-the-go’ the potential for utilising reusable containers is diminished. However, if this were not possible, then non-plastic containing single use containers are an alternative. Cardboard containers without plastic liners or biodegradable bagasse clamshells are already available at commercial scale.

In supermarkets, non-reheatable food to eat on the go is commonly served in single serve plastic packaging, so it will be important to ensure that standards and regulations are consistent for all food-to-go vendors – whether they are cafes and restaurants or supermarkets.

PERSONAL PROTECTIVE EQUIPMENT: MASKS AND GLOVES

Acknowledging the importance of safe protective elements against COVID-19 pandemic, alternatives to single-use items are possible.

In the case of masks, different models of reusable masks exist. However, at present, citizens who opt for reusable masks do not have sufficient information on the requirements that these masks must meet or the certifications required to ensure that they are truly protective. In fact, the supply of reusable masks is clearly on the rise, but often without any information regarding their degree of filtering and breathability, key factors in guaranteeing the effectiveness of the masks. The European Committee for Standardisation is working to harmonise all the different certifications in order to provide this information.⁴⁴

As for gloves, while they can often provide much needed protection against blood or other bodily fluids, they also can provide a dangerous false sense of security since people often do not clean their hands as often when wearing gloves. Hence, a clear alternative is to wash hands with water and soap.



44 Rezero (2020). Mascarillas reutilizables: protegamos la salud y el medio ambiente. Recomendaciones para su adquisición, confección y mantenimiento. <https://rezero.cat/wp-content/uploads/2020/09/202007-mascarillas-reutilizables-rezero.pdf>

ANNEX III

BIO-BASED,

BIODEGRADABLE AND

COMPOSTABLE PLASTICS

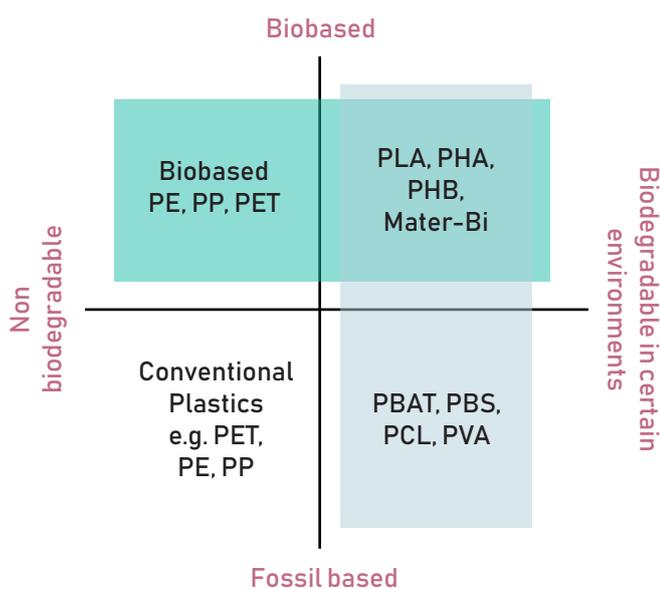


Note: This annex is included as an Annex of the accompanying Information Document.

There are a number of materials which technically and functionally perform as plastics, though are distinguished based on their source material (bio-based as opposed to fossil-based) or biodegradability. The term 'bioplastic' is often used to cover bio-based and biodegradable plastics. However, this term is confusing as it covers a range of different types of material, even fossil-based material. For clarity, the term 'bioplastic' can be split into the following three groups of plastic:⁴⁵

- Biodegradable bio-based.
- Biodegradable fossil-based; and
- Non-biodegradable bio-based.

The figure below shows an overview of plastic types, the origin of their material and the biodegradability.



Raw materials for bio-based plastics come from forestry, agriculture, residues, bio-waste and other sources. This includes timber, cassava, plant oils, fructose, maize, sugar cane/beet, corn, potato, wheat and algae. Currently, 0.016 % of global agricultural areas are used to grow bio-based and biodegradable plastic feedstocks.

BIO-BASED PLASTICS

Bio-based plastics are plastic materials which are derived from plant-based sources, as described above. Plastics which are 'bio-based' may have mixed proportions of fossil and plant-based materials, rather than be-

ing entirely plant-based. Bio-based plastics include PLA (polylactic acid), PHAs (polyhydroxyalkanoate), starch blends and bio-PBS(A) (polybutylene succinate).

Bio-based plastics can be further categorised as drop-in or novel plastics. 'Drop-in' bio-based plastics are so called because of their ability to be exchanged directly with their fossil-based counterpart (e.g. bio-PET). On the other hand, there are completely novel bio-based plastics with a chemical structure like no other, for example PLA and PEF (polyethylenefuranoate).

While bio-based plastics are derived (primarily in-part) from plant-based sources, the chemical process creates polymers that can be identical to conventional plastics. This means that just because plastics are bio-based, does not mean that they are biodegradable. For example, as shown in the figure, bio-based PET does not biodegrade.

BIODEGRADABLE PLASTICS

Biodegradable plastic can be defined as "A degradable material in which the degradation results from the action of microorganisms and ultimately the material is converted to water, carbon dioxide and/or methane and a new cell biomass."

Some biodegradable plastics may biodegrade very quickly in one environment but not in others. It is therefore very important to define timeframe and environment when talking about biodegradation. The term 'biodegradable' has little or no meaning without a clear specification of the exact environmental conditions that this process is expected to occur in.

The rate of decomposition is affected by the presence of bacteria, fungi and oxygen; hence a 'biodegradable' material may decompose in industrial composting conditions, but not (or at a considerably slower rate) in landfills, on land or in the marine environment.

COMPOSTABLE PLASTICS

'Composting' is defined by the European Commission as enhanced biodegradation under managed conditions, predominantly characterised by forced aeration (in the presence of oxygen) and natural heat production resulting from the biological activity taking place inside the material. The term 'compostable plastic' refers to a material that can biodegrade in an industrial composting facility but not necessarily in a home composting environment, in the ocean or in any other natural environments. These will be made from bio-based plastics.

⁴⁵ Eunomia (2021). Information Document for the preparation of guidelines to tackle single-use plastic items in the Mediterranean. Report for SCP/RAC. http://www.cprac.org/docs2/information_document_preparatio_of_guidelines_for_sups.pdf

Industrial composting and anaerobic degradation are the only environments that have been subject to international standards for biodegradation, in the form of the European Standard EN 13432 for plastic packaging and EN 14995 for other plastic items. This is primarily because a test can be developed that simulates some industrial composting and AD facilities. However, there is scepticism towards these standards and the methods used to determine the requirements as some have argued that it is not possible to recreate these environments. Industrial composting and AD processes vary from place to place.

END-OF-LIFE CONSIDERATIONS FOR ALTERNATIVE PLASTICS

COLLECTION

The increased use of “biodegradable” plastics has led to considerable confusion for consumers regarding the correct end of life disposal options for packaging made of such materials. This results in contamination of the organic waste stream when conventional/ non-compostable plastics are wrongly mixed with the stream, and conversely, has also led to contamination of the plastic recycling stream when compostable plastics have wrongly been disposed of here. In both cases, the contamination results in increased costs associated with decontamination, and in some cases, leads to the rejection of entire loads of recyclable/ compostable materials due to quality issues.

A more concerning issue is the misconception that packaging that meets biodegradability standards (such as EN 13432) will degrade in natural environments, leading to the misconception among consumers, and in some cases, the adoption of misleading labelling by producers, suggesting that such packaging can be littered in the environment (whether on land or in water) and will cause no damage. This is not the case, as the biodegradability standard does not refer to degradability of packaging in natural conditions, but rather in test conditions that are unlikely to be replicated in nature. Therefore, biodegradable, compostable, and bio-based plastic packaging is not guaranteed to degrade in the natural environment, and can therefore cause the same environmental damage in these environments as conventional plastics. As the use of such materials increase, given the misconceptions about the degradability of bioplastics at present, they are likely to pose an even greater problem than plastics in some cases.

TREATMENT

There is a range of problems tied to the use of biodegradable and compostable items in the waste management systems that do include organic treatment. If mixed in with food waste, this is most likely sent to treatment plants for biogas production or to industrial composting. As contamination levels are often high, due to incorrect sorting and the use of bags to collect food waste, a pre-treatment process is usually in place to remove contaminations before the food waste enters both biogas plants and industrial composting plants. Regardless of what material the bag is made of, or whether a product is biodegradable or compostable, or made from fossil resources, the objects may be removed in the pre-treatment process.

In this pre-treatment process the bags are ripped open and shredded and the removal of the entire bag, and other contaminants, is challenging. Some particles will follow the process and mix in with the final product (digestate or compost). Leftover plastics that are not removed can cause mechanical trouble to the equipment used in the plant, but also to the equipment used in agriculture when using the digestate or compost. Microplastics have become a severe challenge and there is a high risk that food waste bags and contaminations will give rise to microplastics in the digestate. Some plastics are biodegradable and will degrade over time.

On the other hand, certain bio-based materials can produce common fossil plastic types like PE, PP and PET, which are fully recyclable. These drop-in bio-based plastics are easier to process in existing manufacturing and recycling systems as they are identical to their fossil-based counterparts. Newer bio-based plastics, such as PLA, cannot be recycled together with conventional plastics as existing sorting plants are set to accept fossil-based plastics and do not have separate streams for the newer bio-based plastics. Depending on the sorting technology in place, PLA will therefore either get sorted out of the recycling stream and go to incineration or landfill, or head for recycling. If it does end up entering the recycling process, PLA will cause interference by contaminating the rest of the fossil-based material resulting in lower quality of recyclate, or rejection of the entire load.

It is noted here that the recognised standard for the biodegradability of packaging products in the EU, EN 13432, covers their degradability in industrial treatment plants, both industrial composting and biogas plants. Although some products are certified as compostable as per EN 13432, it is not guaranteed that they will degrade in all composting and biogas plants as the treatment period does not match the criteria of the test method. The test conditions used for certification of biodegradability of packaging products are not comparable to real life conditions in most plants. The pre-treatment process in place at these industrial plants may also remove waste bags and other contaminations to the food waste, including biodegradable and compostable products.

ANNEX IV

TERMINOLOGY



This annex intends to provide a common understanding on notions related to so-called bio-plastics, including biodegradable plastics. Most of the definitions are gathered from the document UN Environment report *Biodegradable Plastics and Marine Litter. Misconceptions, concerns and impacts on marine environments (2015)*. It is suggested to read it for further knowledge.

PLASTIC

Material consisting of any of a wide range of synthetic or semi-synthetic organic compounds that are malleable and so can be molded into solid objects. Plastics are typically organic polymers of high molecular mass and often contain other substances. They are usually synthetic, most commonly derived from petrochemicals, however, an array of variants are made from renewable materials such as polylactic acid from corn or cellulose from cotton linters.

BIO-PLASTIC

The term bio-plastic is a term used rather loosely. It has been often described as comprising both biodegradable plastics and bio-based plastics, which may or may not be biodegradable. To avoid confusion it is suggested that the description “bio-plastic” is qualified to indicate the precise source or properties on the polymer concerned.

BIO-BASED PLASTICS

Bio-based plastics are derived from biomass such as organic waste material or crops grown specifically for the purpose. Some polymers made from biomass sources, such as maize, may be non-biodegradable.

COMMON DEFINITIONS REGARDING THE BIODEGRADATION OF POLYMERS

DEGRADATION

The partial or complete breakdown of a polymer as a result of e.g. UV radiation, oxygen attack, biological attack. This implies alteration of the properties, such as discolouration, surface cracking, and fragmentation.

BIODEGRADATION

Biological process of organic matter, which is completely or partially converted to water, CO₂/methane, energy and new biomass by microorganisms (bacteria and fungi). The conditions under which “biodegradable” polymers will actually biodegrade vary widely. For example, a single-use plastic shopping bag marked ‘biodegradable’ may require the conditions that commonly occur only in an industrial composter (e.g. 50°C) to breakdown completely into its constituent components

of water, carbon dioxide, methane, on a reasonable or practical timescale.

MINERALISATION

In the context of polymer degradation, it refers to the complete breakdown of a polymer as a result of the combined abiotic and microbial activity, into CO₂, water, methane, hydrogen, ammonia and other simple inorganic compounds.

BIODEGRADABLE

Capable of being biodegraded.

COMPOSTABLE

Capable of being biodegraded at elevated temperatures in soil under specified conditions and time scales, usually only encountered in an industrial composter (standards apply).

OXO-DEGRADABLE

Conventional polymers, such as polyethylene, which have had a metal compound added to act as a catalyst, or pro-oxidant, to increase the rate of initial oxidation and fragmentation. They are sometimes referred to as oxy-biodegradable or oxo-degradable. Initial degradation may result in the production of many small fragments (i.e. microplastics), but the eventual fate of these is poorly understood. As with all forms of degradation the rate and degree of fragmentation and utilisation by microorganisms will be dependent on the surrounding environment. There appears to be no convincing published evidence that oxo-degradable plastics do mineralize completely in the environment, except under industrial composting conditions.

EN13432

European compostability standard for biodegradable packaging designed for treatment in industrial composting facilities and anaerobic digestion, requiring that at least 90% of the organic matter is converted into CO₂ within 6 months, and that no more than 30% of the residue is retained by a 2mm mesh sieve after 3 months composting. Standard EN 14995 describes the same requirements and tests, however it applies not only to packaging but plastics in general. The same holds for ISO 18606 “Packaging and the environment – Organic Recycling” and ISO 17088 “Specifications for compostable plastics”.



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