



# Policy Measures on Plastics in Greece

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A Report for WWF Greece

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# 1.0 Introduction

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Eunomia is pleased to present this report to WWF Greece, outlining the key policy measures and associated actions to drive solutions to plastic pollution in Greece. This report builds on the findings of preceding work carried out for WWF Greece in 2019, entitled *Plastic pollution in Greece: How to Stop It – A Practical Guide for Policy Makers*. This paper focusses on plastic production, consumption and waste management measures, associated mainly with household / municipal plastics (particularly packaging). The objective of this work is to fill in the gaps in the prior research to enable WWF Greece to encourage and support key stakeholders, including government, trade bodies and other associated organisations, in implementing some specific measures to tackle plastic pollution in Greece.

There is currently a turning point in the waste management sector in Greece, as the Circular Economy Package, adopted by the EU in 2018, made amends to three key directives: The Waste Framework Directive (WFD), the Packaging and Packaging Waste Directive (94/62/EC) and the Landfill Directive (1999/31/EC). In addition, the Single Use Plastic Directive (2019/904) adopted in 2019 is enforcing bans on specific SUP items while promoting alternative ones and encourages increase in the demand for recycled plastics. Therefore, the Ministry of Environment and Energy (ΥΠΕΝ) is currently revising the national legislation to reflect key amendments including:

- The Plastics Strategy<sup>1</sup> has identified plastics packaging as a priority area when it comes to design for recyclability and reuse<sup>2</sup>. It sets out the **goal that by 2030, all plastics packaging placed on the EU market is reusable or easily recycled**.
- Contributing to this, a review of the Packaging and Packaging Waste Directive's<sup>3</sup> essential requirements<sup>4</sup> as part of a wider Commission Initiative to improve packaging design; promote reuse and recycling; increase recycled content in packaging; tackle excessive packaging and to reduce packaging waste,
- is currently under way with a view to, inter alia, **improving design for re-use and promoting high quality recycling**.

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<sup>1</sup> European Strategy for Plastics in a Circular Economy, COM (2018) 28 final.

<sup>2</sup> Plastic packaging accounts for about 60% of post-consumer plastic waste.

<sup>3</sup> Directive 94/62/EC of the European Parliament and the Council of 20 December 1994 on packaging and packaging waste, OJ L 365, 31.12.1994, p. 10.

<sup>4</sup> Directive 94/62/EC on packaging and packaging waste, Article 9 and Annex II.

- Furthermore, the review of the EU waste legislation in 2018 also enshrined a number of elements to drive reuse and recycling of plastic and plastic packaging waste. Inter alia, the respective recycling (including reuse) targets were substantially increased, with **the target for recycling of plastic packaging waste to double from currently 22.5% to 55% in 2030.**
- In addition, the **obligation and common minimum requirements for extended producer responsibility (EPR) will drive design for recycling of plastic packaging** through the requirements of fee modulation under the EPR. To support the implementation of related legislation, the Commission is preparing guidelines on EPR and on the separate collection and sorting of waste. Eunomia recently completed a study to support the preparation of the Commission’s Guidance for Extended Producer Responsibility Schemes, also covering Member States’ good practices.<sup>5</sup>
- The Plastics Strategy and Directive 2019/904(6) are also **promoting the increase in the demand for recycled plastics by setting ambitious objectives for recycled content in plastics products while encouraging the introduction of Deposit Refund Systems (DRS) to improve both quality and quantity of plastic**

The purpose of this work is, therefore, to build upon the measures identified in the preceding WWF study by providing a meaningful assessment of actions that are likely to be required under each measure. This included, to the extent possible, commentary on key considerations for their implementation, and likely outcomes based on their use elsewhere in the world.

In addition, we sought to supplement the previous findings with additional measures to tackle plastic pollution from alternative sources (microplastics and sea-based sources).

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<sup>5</sup> European Commission (2020), Study to Support Preparation of the Commission’s Guidance for Extended Producer Responsibility Schemes, accessed 8 June 2020, [https://ec.europa.eu/environment/waste/studies/pdf/DG%20Env%20EPR%20Guidance%20-%20Final%20Report\\_FOR%20PUBLICATION.pdf](https://ec.europa.eu/environment/waste/studies/pdf/DG%20Env%20EPR%20Guidance%20-%20Final%20Report_FOR%20PUBLICATION.pdf)

## 2.0 Approach

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The project commenced with an inception meeting to clearly define the objectives and scope of work. The approach, to better understand the state of plastic pollution management in Greece and propose specific measures, consisted of:

- [Chapter 3.0 Literature review](#): A short summary of existing knowledge on the sources, pathways, and points of leakage for plastic pollution in Greece (largely based on the findings of the previous work to develop a Guide for Policy Makers – referenced above).
- [Chapter 4.0 Policy Context](#): A review of the EU legislative context that is driving change in plastic pollution management systems in Greece, in respect of The EU Circular Economy Package (the revised Waste Framework, Packaging and Packaging Waste (including the revision of the Essential Requirements and guidance on Extended Producer Responsibility using modulated fees), Landfill, and Single Use Plastics Directives).
- [Chapter 5.0 Existing Plastic Pollution Management Systems in Greece](#) A strategic review of relevant plastic pollution management systems already in place in Greece, including, for example, plastic waste collection and recycling system performance and the role of EPR schemes (for packaging in particular) in preventing waste and litter.
- [Chapter 6.0 Policy Measures](#): A number of potentially viable solutions across the value-chain of plastic pollution management were then explored. Based on the findings of previous relevant literature review as well as the *Plastic pollution in Greece: how to stop it. A practical guide for policy makers* (Dalberg Advisors, 2019) published by WWF such measures include, but are not limited to:
  - Production-related measures
  - Consumption reduction measures
  - Waste management improvement measures
  - Additional horizontal measures that could be considered were explored including public awareness programmes and Implementation and enforcement of penalties for waste violations;

Regular progress meetings were held to discuss the emerging findings to ensure that the proposed solutions were in agreement with WWF Greece.

From among the long list of measures identified, 17 were shortlisted for further assessment. In line with the waste hierarchy, the project team focused on measures that:

- Prevent plastic waste being generated in the first place;
- Encourage higher levels of recycling of plastic; and importantly;
- Prevent plastic waste becoming littered.

For each measure, key considerations for implementation, and any likely outcomes were assessed, based on a strategic review of the available literature and Eunomia's prior knowledge. A series of front-running measures, with key actions were identified that could support their implementation, along with the various positive and negative attributes clearly described.

- [Chapter 7 Scorecard](#): A scorecard was developed to measure achievement or progress towards reduction of plastic pollution in Greece in the medium and long term.

It is noted that detail on the design of these measures in the Greek context is out of the scope of this work, as is an assessment or quantification of the impacts associated with them.

## 3.0 Literature Review

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The issue of plastic pollution in the Mediterranean has come under increased focus in recent years, because, according to WWF, around 0.57 million tonnes of plastic waste enters the Mediterranean every year. And this number is expected to continue rising. In a region which relies heavily on the tourism, maritime and fishing industries, marine plastic pollution is a ubiquitous and costly challenge. This literature review provides a summary of the existing knowledge of the sources and pathways of plastic pollution in Greece.

The review is largely based on the findings of previous work by WWF to develop a *Guide for Policy Makers*. As noted in the research, Greece generates around 700,000 tonnes of plastic waste annually, which equates to 68kg/capita. What is more, waste generation rises by about 26% during the peak tourist season. The scale of marine pollution from both macro and micro plastic is significant. With the longest coastline in Europe, over 3,000 islands and extensive waste collection and management challenges, 6% of waste leaks into nature. Indeed, with an estimated 39 tonnes of plastic waste entering Greek waters every day<sup>6</sup>, the economic impact can reach €26million each year<sup>7</sup>.

### 3.1.1 Sources of Marine Plastic Pollution

There are two primary sources of marine plastic pollution: plastic waste entering the sea indirectly from terrestrial based activities, or directly from coastal and sea-based activities. Studies have shown that generally, 80% of litter entering the marine environment is from land-based sources, and 20% from ocean-based sources.

Firstly, mismanaged waste is a key source of terrestrial-based plastic pollution in Greece. With a landfill rate of 81.9%, only an 18.1% recycling rate and limited waste collection infrastructure, plastic waste leaks into the environment from the waste management system. Uncontrolled and open landfills operate across the country and although there have been efforts to close illegal landfills (those which do not meet the requirements of the landfill Directive), several sites are still active. Moreover, in depth assessment by Eunomia suggests that losses from landfills due to poor storage, transport and management of sites, as well as waste being washed away due to wind, rain and erosion, are in the order of 5% of all waste sent to landfill. Losses are also experienced in the

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6 Source: <https://www.themayor.eu/en/greece-picks-new-fight-with-plastics>, accessed 7 May 2020.

7 [Dalberg Advisors et al, \(2019\)](#) *Plastic pollution in Greece: how to stop it. A practical guide for policy makers*

recycling system, again from poor separate collection, transport and management of operations.

Secondly, plastic waste is littered both inland and directly at the coast. There is a lack of data on the amount of litter generated in Greece. Plastic litter can stem from being dropped, and blowing out of on-the-go bins. A combination of the increase of consumption of one-way plastics poor waste management system and lack of enforcement has made single-use plastic packaging items representing the largest source of plastic waste in countries across the Mediterranean.

Coastal activities meanwhile, are reported to cause 68% of marine plastic pollution in the Mediterranean. In a study of 80 Greek beaches during clean-ups conducted in 2006-2007 as part of the 'Clean up the Med' initiative, over half of the collected material was plastic. Littering associated with onshore and nearshore recreation are the dominant causes. Furthermore, according to the HELMEPA, in 2017, cigarette butts were the top litter item on Greek beaches, followed by plastics straws, food containers, bottles, plastic bottle caps and bags.<sup>8</sup>

Finally, 28% of plastic waste entering the Mediterranean is from direct sea-based activities such as fishing, aquaculture and shipping. Greece contributes the 4<sup>th</sup> highest amount of sea-based plastic waste in the region.

### 3.1.2 Pathways of Plastic Waste to the Marine Environment

From the key sources of plastic waste entering the environment, there are various pathways which the plastic follows to the ocean. Notably, rivers are one of the main pathways that terrestrial plastic waste which is littered enters the marine environment. The Axios (Αξιός) and Evros (Έβρος) rivers are highlighted as hot spots, responsible for 4% of waste leaked into the Mediterranean from Greece.

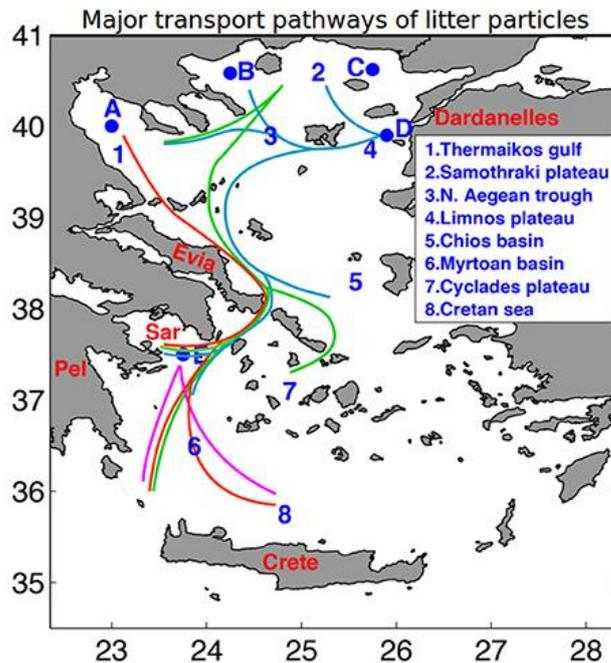
Based on a study published by Dimitrios V. Politikos et al. in 2017, the major transport pathways of floating litter particles illustrated that source regions are interconnected (Figure 1)<sup>9</sup>. A characteristic example is the case of the Saronikos Gulf (Source Region E), from which 92% of particles escaped through transects T1 and T2 to eastern Mediterranean Sea, whereas it received particles from sources A, B, C, and D. In the same extent, source A (Thermaikos Gulf) received floating litter particles originating from the North Aegean Sea (sources B, C), while floating litter particles released from source D tended to occasionally be directed toward sources B and C. In addition, the northeastern area alongside the Evia island received particles that were released from sources B, C and D.

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<sup>8</sup> Greek City Times (2018) *Over tourism and pollution real threats for Greece*, accessed 1 May 2020, <https://greekcitytimes.com/2018/06/11/over-tourism-and-pollution-real-threats-for-greece/?amp>

<sup>9</sup> Dimitrios V. Politikos et al. (2017), *Modeling the Fate and Distribution of Floating Litter Particles in the Aegean Sea (E. Mediterranean)*

**Figure 1 Major Transport pathways of litter particles**



Source: Dimitrios V. Politikos et al. (2017), Modeling the Fate and Distribution of Floating Litter Particles in the Aegean Sea (E. Mediterranean)

Macro-plastics which are littered can be blown or swept directly into rivers, or into drains entering the sewerage system. Household plastics, such as wet wipes and cotton buds, are also flushed down toilets. While some plastic waste will be screened out at waste water treatment plants, blockages and resulting overflows during high rainfall events, discharge the plastic waste to the environment, again often entering rivers. In urban centres in Greece, much of the sewerage network is older, built using small-bore pipework in combined networks that are more prone to blockages and overflow. Although, the majority of the system outside urban centres is newer, using separate collection systems. It is unknown the extent to which incorrect disposal of single use plastics via the drainage system is a problem in Greece.

Microplastics (in particular those less than 5mm in length) are considered to enter the ocean through such pathways. Research by the Archipelagos Institute of Marine Conservation, a Greek non-profit, has shown that microplastics are present in beach sediments throughout the country, and are also found to be present in a variety of sampled fish and marine invertebrates.<sup>10</sup>

The majority of microplastics, including pellets, are released directly the terrestrial environment, or through waste pipes and drains. Microfibres from clothing and

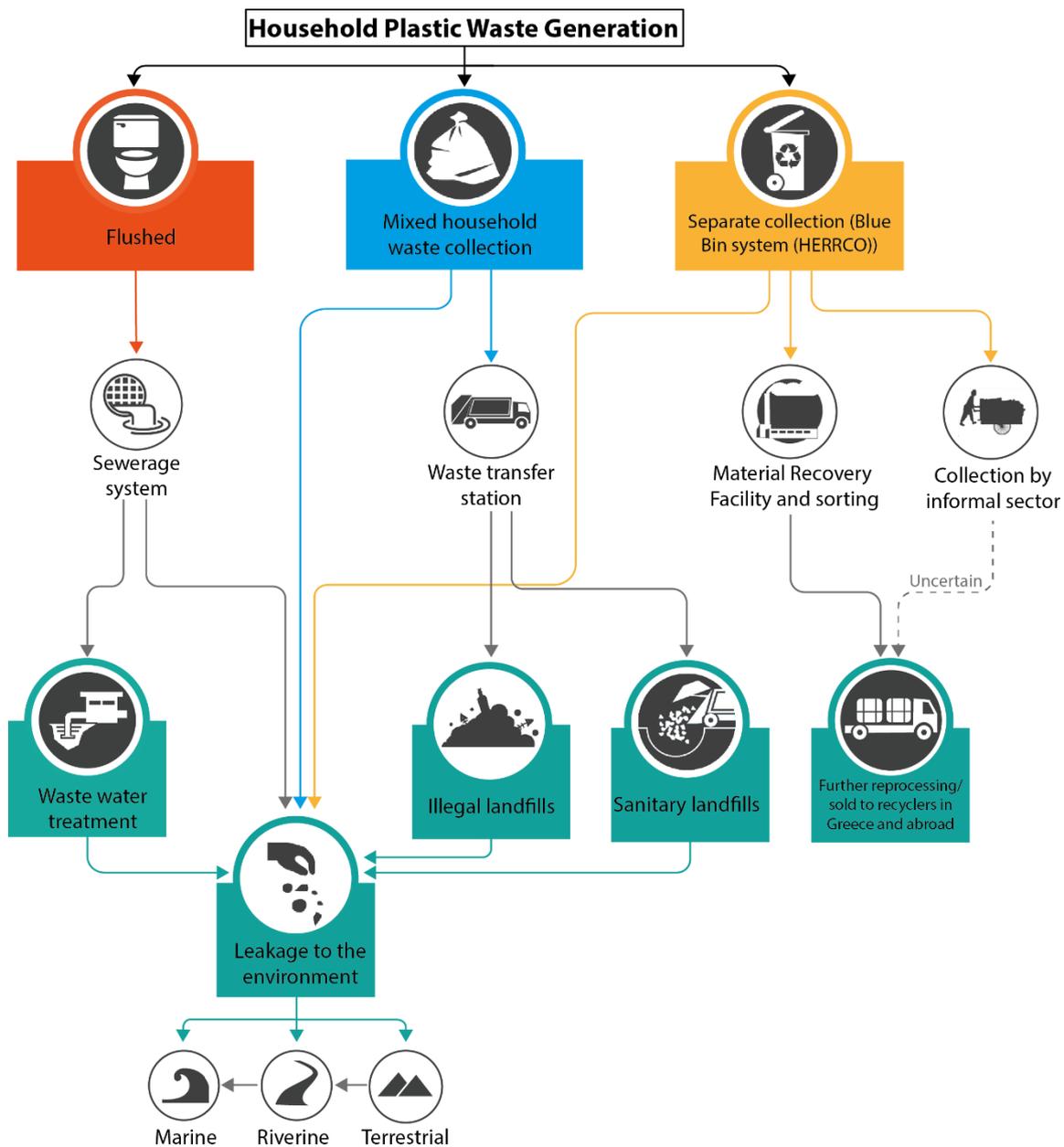
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<sup>10</sup> Archipelagos Institute of Marine Conservation (2020) *Microplastics*, accessed 1 May 2020, <https://archipelago.gr/en/our-work/laboratory-research/microplastics/>

microbeads from cosmetics mostly get washed into the sewerage system, while microplastics from tyres and brake wear are released into the wider environment.

Figure 2 illustrates the main sources and pathways of plastic to the sea in Greece.

**Figure 2 Sources and Pathways of plastic pollution to the marine environment**



### 3.1.3 Summary

In summary, the literature review indicates the scale and extent of marine plastic pollution in Greece, outlining the key sources and pathways of plastic waste to the marine environment. The issue of plastic pollution in the Mediterranean is significant, especially of single-use plastics. The pollution stems from a number of sources, including poor waste collection and management, littering and sea-based activities, ultimately damaging marine ecosystems on which a significant proportion of the Greek economy depends (approximately 20% of the economy depending on tourism directly or indirectly).

## 4.0 Policy Context

The problem of plastic pollution has risen up the European political agenda in recent years. There are a number of longer-standing and newly introduced Directives, regulations and strategies which aim to tackle plastic waste and pollution management in Member States across the EU.

This section firstly outlines the key policy at a European level before examining the relevant policy context in Greece. A summary of the different policies is provided in Table 1 below.

Thus, this section is structured as follows:

- Summary of Policy Context (Table 1);
- Section 4.1 European Policy Context – covering marine plastic pollution; plastic waste management and the European Green Deal;
- Section 4.2 Greek Policy Context – national legislation and Strategy/Plan;
- Section 4.3 Summary.

**Table 1: Summary of Policy Context (EU and National level)**

Policy name	Summary	Relevance
<b>EU Policy</b>		
<b>The European Green Deal and Circular Economy Action Plan (launched 2020)</b>	Roadmap for increasing the sustainability of Europe’s economy. Aim to transition the European economy to carbon neutrality by 2050.	The Commission is to propose policies regarding products placed on the EU market, ensuring that they are designed for longer life and recyclability and that they incorporate as much recycled content as possible.  Aims to develop the market for secondary raw materials.
<b>Waste Framework Directive (2008/98/EC)</b>	Introduces the waste hierarchy and mandatory recycling targets as well as concepts such as the polluter pays principle and extended producer responsibility.	Member States must meet targets including: 55% of municipal waste prepared for re-use/recycling by 2025, 60% by 2030 and 65% by 2035.

Policy name	Summary	Relevance
<b>Packaging and Packaging Waste Directive (94/62/EC) and (2018/852)</b>	The 2018 revised PPWD contains updated measures to prevent the production of packaging waste, and promote the reuse, recycling and other forms of recovery of packaging waste.	Targets for packaging recycling and establishment of EPR schemes for packaging.
<b>Landfill Directive (1999/31/EC)</b>	Aims to prevent or reduce the negative effects of landfilling on the environment and human health.	Specifies uniform standards and requirements such as for landfill location and management, and the characteristics of the waste to be landfilled.  A target of max 10% landfill on MSW by 2035 is set.  By 2030, Member States must ensure that waste which is suitable for recycling or other recovery is not disposed of in landfills.
<b>Directive on the reduction of the impact of certain plastic products on the environment (2019/904/EC)</b>	Objectives to tackle marine litter, reduce consumption of single use plastic, and to increase separate collection and recycling.	Promoting the increase in the demand for recycled plastics by setting ambitious objectives for recycled content in plastics products Encouraging the introduction of Deposit Refund Systems (DRS) to improve both quality and quantity of plastic Banning of specific SUP items and identifying alternatives to be introduced.  Member states have to transpose the Directive by July 2021.
<b>Port Reception Facilities (PRF) Directive (2000/59/EC)</b>	Aims to reduce pollution from ships at sea, including abandoned or lost fishing gear.	Ports are required to provide adequate facilities to collect waste from ships.
<b>Marine Strategy Framework Directive (MSFD) (2008)</b>	Objective to preserve and protect the marine environment, including to reduce litter items entering seas and oceans.	Member States are required to put in place management measures to achieve Good Environmental Status in their marine waters by 2020
<b>National Policy</b>		
<b>Law 2939/2001 on packaging and packaging waste</b>	Transposes the PPWD.	Established the producer responsibility organisation HERRCO.

Policy name	Summary	Relevance
<b>Law on Waste Management 4042/2012</b>	Transposes the WFD.	Proposes a landfill tax, which was not implemented <sup>11</sup> : starting at EUR 35/tonne, increasing by EUR 5/tonne every year up to a maximum of EUR 60/tonne.
<b>The National Waste Management Plan (2015)</b>	Currently under review. Outlines the policy, strategy and targets for waste management.	Concerns the allocation of waste management to municipalities. Targets for reduction in generation of waste and landfilling.
<b>National Waste Prevention Plan (2015)</b>	Aims to promote sustainable consumption and reuse of products, principally through raising awareness of waste prevention.	Proposes targets and actions to tackle packaging waste.
<b>Law 2939/2001 and the New Recycling Law 4496/2017</b>	Transpose the PPWD.	Obligates the separate collection of dry recyclables.
<b>Law 4496/7.11.2017 on lightweight plastic carrier bags</b>	The legal framework for the lightweight plastic carrier bag charge.	Introduces an environmental levy of €0.03 (€0.04 including VAT) starting from January 2018 with a prediction to increase the rate the following year to €0.07 (€0.09 including VAT).
<b>National Action Plan on the Circular Economy (2018)</b>	Proposes goals for 2030, including: moving up the waste hierarchy, supporting circular consumption of products, such as reuse and repair, and monitoring progress towards a circular economy.	Aims to promote the reuse and recycling of plastic waste and the management of plastics in accordance with the European Strategy for Plastic Materials.
<b>Law 4609/3.5.2019 on the Circular Economy Fee</b>	Introduces the Circular Economy Fee which replaces the proposed landfill tax of Law 4042/2012.	The fee will incorporate municipal waste and separately collected waste, including separately collected municipal packaging waste which is disposed of in landfill.

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<sup>11</sup> Landfill tax has never been implemented; instead, since its adoption in 2014, a series of legal suspensions occurred (Laws 4257/2014 – Article 77, Legal Act Government Gazette A'182 - Article 77, 4447/2016 – Article 35, and 4508/2017 – Article 39)

## 4.1 European Policy Context

### Marine Plastic Pollution

Marine plastic pollution, in particular, has become increasingly important in European policy making, along with a greater focus on plastic waste in general. One of the first EU policies addressing this issue was the Port Reception Facilities (PRF) Directive, established in 2000. The PRF Directive aims to reduce pollution from ships at sea, including abandoned or lost fishing gear, predominantly made of plastic. Under the Directive, ports are required to provide adequate facilities to collect waste from ships.<sup>12</sup>

Following the PRF Directive was the Marine Strategy Framework Directive (MSFD) introduced in 2008. The objective of the MSFD is to preserve and protect the marine environment, part of which is to prevent and reduce pollution, including visible litter items within specific categories, entering seas and oceans.<sup>13</sup> Member States are required to put in place management measures to achieve Good Environmental Status in their marine waters by 2020.

More recently, perhaps the most relevant Directive concerning plastic pollution, is Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. The objectives of the Directive are to: tackle marine litter, reduce consumption of single use plastic, and to increase separate collection and recycling. The scope of the Directive is based on the top 10 single-use plastic items found on beaches across the EU. As such this includes measures relating to the following products:

- Beverage containers;
- Food containers, packets and wrappers;
- Plastic carrier bags;
- Cups for beverages;
- Plates, cutlery, straws, beverage stirrers;
- Certain sanitary products, balloon sticks, tobacco products, wet wipes for domestic use and cotton bud sticks;<sup>14</sup> and
- Fishing gear.

Different measures are included according to item group, such as: consumption reduction measures and bans, EPR schemes, product and marking requirements, separate collection targets and awareness raising. The implementing act for the Directive is due to be published in the summer of 2020.

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<sup>12</sup> The European Parliament and the Council of the European Union (2000) DIRECTIVE 2000/59/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues

<sup>13</sup> European Commission (2008) Directive 2008/56/EC - Marine Strategy Framework Directive

<sup>14</sup> European Commission (2019) Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment

## Plastic Waste Management

With regards to plastic waste management, the Circular Economy Package,<sup>15</sup> adopted by the EU in 2018, made amends to three key directives: The Waste Framework Directive (WFD), the Packaging and Packaging Waste Directive (94/62/EC) and the Landfill Directive (1999/31/EC).

Firstly, the WFD formalises the management of waste and material use, introducing the waste hierarchy and mandatory recycling targets, as well as the concepts of ‘polluter pays’ and ‘extended producer responsibility’. The 2018 revision further strengthened measures to prevent waste and to reduce the environmental impacts of waste generation and management. More ambitious targets include: 55% of municipal waste prepared for re-use/recycling by 2025, 60% by 2030 and 65% by 2035. Member States must meet the following requirements:

- establish waste prevention programmes;
- take the necessary measures to ensure that waste undergoes recovery (e.g. preparing for re-use, recycling or other recovery operations);
- arrange for separate collection for paper, metal, plastic, and glass waste;
- take appropriate measures to promote the re-use and recycling of wastes; and
- establish minimum operating requirements for extended producer responsibility schemes.<sup>16</sup>

Secondly, the revised Packaging and Packaging Waste Directive (PPWD) puts forward new targets specific to plastic packaging in addition to other measures to prevent packaging waste, as listed below:

- By 2030, at least 55% by weight of plastic packaging must be recycled;
- By 2025, Member States must also ensure that EPR schemes are created for all packaging types; and
- Member States must take measures to encourage the use of reusable packaging, such as using deposit-return schemes.<sup>17</sup>

It should also be noted that the Essential Requirements in Annex II of the PPWD are under revision. Principally, the purpose of the Essential Requirements is to limit the amount of packaging and the hazardous substances used in packaging materials and to promote the design of reusable or recoverable packaging. Indeed, the revisions aim to

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<sup>15</sup> European Parliamentary Research Service (2018) *Circular economy package: Four legislative proposals on waste*,

[https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/614766/EPRS\\_BRI\(2018\)614766\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/614766/EPRS_BRI(2018)614766_EN.pdf)

<sup>16</sup> European Commission (2018) *Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste*, accessed 2 June 2020, <http://data.europa.eu/eli/dir/2018/851/oj/eng>

<sup>17</sup> European Parliament and the Council (2018) *Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste*

ensure that all plastic packaging placed on the market in the EU is reusable or recycled in a cost-effective manner by 2030.

Thirdly, the revised Landfill Directive obligates Member States to reduce waste disposed in landfills. By 2035, Member States shall take the necessary measures to ensure that by 2035 the amount of municipal waste landfilled is reduced to 10 % or less of the total amount of municipal waste generated (by weight).<sup>18</sup>

### The European Green Deal

Launched at the end of 2019, the European Green Deal is the EU's new clean growth strategy. It presents a roadmap to increase the sustainability of Europe's economy, transitioning to a carbon neutrality by 2050.<sup>19</sup> Although a strategy with scope beyond plastics, one of the main components of the Deal - the Circular Economy Action Plan - proposes initiatives along the lifecycle of products. The Plan makes several proposals, including: sustainable product policy, empowering consumers, the right to repair, green public procurement, value chain actions and ensuring support for the circular economy transition through jobs and skills.<sup>20</sup>

Specifically, the Commission is to establish policies regarding products placed on the EU market, ensuring that they are designed for longer life and recyclability, and that they incorporate as much recycled content as possible. A key aim is also to develop the market for secondary raw materials.

Moreover, there will be further restrictions on single-use items, along with mandatory requirements on:

- What is allowed on the EU market, including the reduction of (over)packaging;
- Requirements for recycled content in plastics and special attention on microplastics as well as biobased and biodegradable plastics;
- Restricting intentionally added microplastics and tackling pellets;
- Labelling of products such as tobacco, beverage cups and wet wipes; and
- Ensuring the introduction of tethered caps for bottles to prevent littering (currently on-hold)<sup>21</sup>.

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<sup>18</sup> European Commission (2018) *Directive (EU) 2018/ of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste*, accessed 2 June 2020, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0850&from=EN>

<sup>19</sup> European Commission (2020) *A European Green Deal*, accessed 2 June 2020, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

<sup>20</sup> European Commission (2020) *Circular Economy Action Plan: For a cleaner and more competitive Europe*, accessed 14 May 2020, [https://ec.europa.eu/environment/circular-economy/pdf/new\\_circular\\_economy\\_action\\_plan.pdf](https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf)

21 Source: <https://packagingeurope.com/can-tethered-caps-set-plastic-waste-free/>

## 4.2 Greek Policy Context

### Transposition of EU Directives – National Legislation

Following the requirements and policy direction of the EU, the Greek Ministry of Environment has proposed a number of approaches to tackle plastic pollution. Greece has already transposed relevant EU Directives into national laws in the past namely:

- Law 2939/2001 and the New Recycling Law 4496/2017 transposed the PPWD. The revision allows municipalities to manage recyclable material and the revenue this generates themselves, obligating the separate collection of paper, glass, metals and plastics;
- Law 2939/2001 also established the producer responsibility organisation HERRCO, which has been responsible for the majority of packaging waste recycling in Greece since 2003. In 2010, Law 3854/2010 enacted the ‘polluter pays principle’ as state law;
- The National Waste Management Plan, introduced in 2003 as an annex to the Ministerial Decision 50910/2727/2003 ‘on measures and terms for solid waste management - national and regional planning management’;
- The Law on Waste Management 4042/2012 transposes the WFD. Under the law, from January 2014, the disposal of untreated waste into landfills is subject to a tax from €35-€65/tonne. However, the tax is yet to be implemented;
- The Law 4496/7.11.2017 enacted a charge for lightweight plastic carrier bags with a wall thickness below 50 microns. In January 2019, the cost of such bags increased from €0.04 to €0.09. The outcome of current public consultations could see the charge applied to all plastic carrier bags in the future;<sup>22</sup>
- The Law 4609/3.5.2019 introduced the Circular Economy Fee. This replaces the proposed landfill tax of Law 4042/2012. Beginning in 2020, the fee will incorporate garden and park waste, municipal waste and separately collected waste, including separately collected municipal packaging waste which is disposed of by landfill.<sup>23</sup>

The revised WFD, PPWD, Landfill Directive and the Directive on the reduction of the impact of certain plastic products on the environment are currently under revision at national level and are expected to be incorporated into Greek legislation in 2020.

### National Strategy

Importantly, in 2015, the National Waste Management Plan (NWMP) and the National Waste Prevention Plan (NWPP) were introduced. The purpose of the NWMP, which is currently under review, was to outline the policy, strategy and targets for waste

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<sup>22</sup> Ελληνικός Οργανισμός Ανακύκλωσης Πλαστική Σακούλα Μεταφοράς, accessed 2 June 2020, <https://www.eoan.gr/uploads/files/578/80e6f51406fb6435a8d778e8bf3620a9628ca5f8.pdf>

<sup>23</sup> Kodiko (2020) ΝΟΜΟΣ 4609/2019, accessed 2 June 2020, [https://www.kodiko.gr/nomologia/document\\_navigation/513763/nomos-4609-2019](https://www.kodiko.gr/nomologia/document_navigation/513763/nomos-4609-2019)

management, suggesting appropriate means by which to achieve the targets. The key targets focus on the allocation of waste management to municipalities and the reduction in generation of waste, as well as targets concerning municipal solid waste and landfilling.

In comparison, the NWPP aims to promote sustainable consumption and reuse of products, principally through raising awareness of waste prevention. The Plan identifies priority areas, including packaging waste and WEEE, and, in accordance with EU legislation, proposes targets and actions to tackle each priority waste stream.

In 2018, the National Action Plan on the Circular Economy proposed a set of goals for 2030, including moving up the waste hierarchy, supporting circular consumption of products such as reuse and repair and monitoring progress towards a circular economy. The introduction of quality standards for secondary raw materials is also stated;<sup>24</sup>

### 4.3 Summary

In summary, there are a number of policies at the EU level which influence plastic waste management in Greece. Whilst the earlier EU Directives have been transposed into national Greek law, more recent regulations and strategies are yet to be fully enacted. At the same time, relevant Greek legislation is under review, and will signal the future direction of Greek policy to tackle plastic pollution.

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<sup>24</sup> Ministry of Environment & Energy (2018) *National Circular Economy Strategy*, accessed 2 June 2020, [https://circulareconomy.europa.eu/platform/sites/default/files/national\\_circular\\_economy\\_strategy.pdf](https://circulareconomy.europa.eu/platform/sites/default/files/national_circular_economy_strategy.pdf)

# 5.0 Existing Plastic Pollution Management Systems in Greece

This section provides a strategic review of relevant plastic pollution management systems already in place in Greece including current practices, EPR schemes, policies and initiatives. In light of the Commission’s Circular Economy Package, the review focuses on plastic waste prevention, collection and recycling performance, the role of EPR schemes and current initiatives in preventing plastic waste and litter in Greece, mainly associated with municipal plastics (particularly packaging). In addition to municipal plastics, existing plastic pollution management systems for other plastic categories, such as agri-plastics, tyres and marine plastics (i.e. fishing gear), are also explored.

The section is structured as follows:

- Summary of existing plastic pollution management systems in Greece ( Table 2)
- Section 5.1.1 An outline of the current waste management, recycling and EPR system;
- Section 5.1.2 Incentives to increase separate collection;
- Section 5.1.3 Private Sector Initiatives;
- Section 5.1.4 Voluntary and NGO plastic waste management initiatives.

Table 2 below summarises the existing waste management systems and initiatives aiming to reduce plastic pollution in Greece.

**Table 2: Summary of existing waste management systems and initiatives aiming to reduce plastic pollution in Greece**

Waste Management Type	Timeframe	Value chain point	Plastic category	Description
HERRCO EPR scheme	2003 to present	Waste management	Packaging	The main packaging compliance scheme in Greece. HERRCO is responsible for the design and implementation of recycling policy and operates the Blue Bin system for collection of co-mingled recyclables.

Waste Management Type	Timeframe	Value chain point	Plastic category	Description
<b>AB Vassilopoulos EPR scheme</b>	2003 to present	Waste management	Packaging	Operated recycling points at AB Vassilopoulos supermarkets for up to seven different materials of private branded products including plastic bottles, containers and bags.
<b>Antapodotiki (Rewarding Recycling)</b>	2008 to present	Waste management	Packaging	Organises and promotes packaging recycling across Greece. The system uses recycling kiosks and a financial reward to encourage consumers. A reward return scheme that collects separately plastic, metal and glass through a type of 'RVM'. The consumer deposits the material and receives a vouchers (1 EUR = 33 packaging items deposited) – this is not a DRS.
<b>Material Recovery Facility (MRF)</b>	-	Waste management	Packaging	35 MRFs are operating in Greece today sorting plastic waste, amongst other waste material.
<b>Mechanical Biological Treatment (MBT)</b>	-	Waste management	Plastic in MSW that is not separately collected	There are six MBTs currently in operation. 17 new MBT units are to be procured by the end of 2020 and in total 40 plants are intended by 2021.
<b>Landfill</b>	-	Waste management	Plastic in MSW that is not separately collected	Currently 81.9% of all waste in Greece is landfilled. There are 75 active landfills across Greece and several illegal landfills still operating.
<b>Informal sector</b>	-	Waste management	Packaging	High value materials are removed by the informal sector from recycling and MSW bins.

Waste Management Type	Timeframe	Value chain point	Plastic category	Description
Programmes addressing marine litter	Various	Waste Management and Consumption	Various: SUP, plastic bags, fishing gear	There are a number of NGO and charity initiatives to prevent and reduce marine plastic pollution across Greece. These include: Clean Blue Paros, Sea Change Greek Islands, Alonnisos without Plastic Bags, Blue Cycle, Enaleia, the Blue Flag programme, Cyclades Preservation Fund and the Healthy Seas and Ghost Fishing initiative.

### 5.1 National Waste Management System

A variety of stakeholders are responsible for waste management in Greece, including: the Greek Ministry of Environment and Energy at the national level, the Hellenic Recycling Agency (EOAN) responsible for the approval, monitoring, and control of the existing operating systems in Greece, the Hellenic Recovery Recycling Cooperation (HERRCO) which is the competent authority (Producer Responsibility Organisation) for the design and implementation of recycling policy, municipalities responsible for waste collection and management at the local level. Several NGOs and charities are involved in improving waste management in Greece through voluntary actions such awareness raising campaigns and pilot programmes.

In Greece, the majority of waste is sent to landfill. This includes plastic waste which is not separately collected and is instead disposed of with municipal solid waste (MSW) in the residual bins. Approximately 81.9% of municipal waste is landfilled and there are 75 active landfill sites across the country. However, not all sites meet landfill requirements, and despite efforts a number of illegal landfills and open dumping sites remain in use, at odds with the need to divert waste from landfills under national and EU targets.<sup>25</sup> Indeed, in 2014, Greece faced a €10 million fine from the European Court of Justice for failing to meet the requirements to close illegal landfills.<sup>26</sup>

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<sup>25</sup> WWF (2019) *Plastic pollution in Greece: how to stop it. A practical guide for policy makers*, accessed 1 May 2020, [http://awsassets.panda.org/downloads/05062019\\_wwf\\_greece\\_guidebook.pdf](http://awsassets.panda.org/downloads/05062019_wwf_greece_guidebook.pdf)

<sup>26</sup> Perchard, E. (2016) *Austerity-hit Greece faces further fines for poor waste management*, accessed 11 May 2020, <https://resource.co/article/austerity-hit-greece-faces-further-fines-poor-waste-management-11368>

In terms of waste treatment, there are currently six MBTs in operation: four MBTs in Kozani (since 2017), Ioannina (since 2018), Serres (since 2019) and Chania (since 2006 and has been upgraded) and 2 old MBTs in Athens (since 2007) and Heraklion (Crete, since 2008) that need upgrading. In addition, 17 new MBT units are to be procured by the end of 2020 according to national planning and with a total of 40 plants by 2021.

### 5.1.1 EPR Schemes

#### Collective Alternative Management System for packaging waste - HERRCO

The Hellenic Recovery Recycling Corporation (HERRCO) is the main PRO for packaging waste, implementing a collective system for packaging waste, with a coverage of 95% nationwide. HERRCO's main activity is the development, funding, and operation of a network of "blue bins" for co-mingled packaging waste, in cooperation with municipalities.<sup>27</sup>

In 2003, HERRCO introduced the Blue Bin recycling system for co-mingled packaging waste collection: paper and cardboard, metal, glass and plastic. Between 2011 and 2015 the percentage of the population covered by the blue bin system is reported to have increased from 75% to 92%<sup>28</sup> and in 2018 the reported coverage figure reached 95%. Over the same period (2011-2015), the number of Material Recovery Facilities (MRF) also increased from 28 to 32 and today there are 35, 9 of which are operated by HERRCO.

In 2018, HERRCO reported that around 389,079 tonnes of packaging were put on the Greek market, whereas 488,097 were recycled. The issue of under-reporting of packaging waste placed on the market as well as free riding remains significant<sup>29</sup>, despite an estimate of 2,336 producers being registered to the EPR scheme (compared to 1,847 in 2015).

Contamination, as a result of low-consumer awareness, presents a significant challenge to the separate collection of recyclable plastic waste. Indeed, only 6% of all plastic waste is placed in blue bins and an estimated 50% of the content of the bins is contaminated.<sup>30</sup>

In 2015, HERRCO reported that around 356,000 tonnes of recyclables were collected and 202,000 tonnes were recycled. The difference between collected and recycled quantities

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<sup>27</sup> Frantzis, I. et al (2019) Economic instruments to improve waste management in Greece, accessed 11 May 2020

<sup>28</sup> HERRCO (2017) *Packaging Recycling: A project for all of us*, accessed 11 May 2020, [https://www.HERRCO.gr/wp-content/uploads/2017/10/Annual\\_EEAA\\_2015\\_en.pdf](https://www.HERRCO.gr/wp-content/uploads/2017/10/Annual_EEAA_2015_en.pdf)

<sup>29</sup> Hogg, D.D., Elliott, T., Burgess, R., and Vergunst, T. (2018) *Study to Identify Member States at Risk of Non-Compliance with the 2020 Target of the Waste Framework Directive and to Follow-up Phase 1 and 2 of the Compliance Promotion Exercise*, March 2018

<sup>30</sup> WWF (2019) *Plastic pollution in Greece: how to stop it. A practical guide for policy makers*, accessed 1 May 2020, [http://awsassets.panda.org/downloads/05062019\\_wwf\\_greece\\_guidebook.pdf](http://awsassets.panda.org/downloads/05062019_wwf_greece_guidebook.pdf)

indicates a loss rate of around 43%, thus highlighting the low overall performance of the system.<sup>31</sup> It is worth noting however, that the informal sector in Greece also plays a role here. Over recent years, the growing number of economic immigrants has resulted in the increased removal of high value materials from recycling bins, although this typically consists of paper, cardboard and metals.

Moreover, the EPR fees producers are obliged to pay for plastic packaging put on the market is 66 EUR /tonne, compared to 52,5 EUR /tonne for paper and card, 21 EUR /tonne for steel, 8,8 EUR/tonne for aluminium and 10,9 EUR/tonne for glass.

### Other EPR Schemes for Municipal Packaging

In addition to HERRCO, AB Vasilopoulos and Antapodotiki are two other EPR schemes for packaging waste. AB Vasilopoulos is a supermarket chain which has operated recycling centres for own brand products since 2003. Up to seven different materials can be recycled including: plastic bottles, metal cans, glass bottles, plastic bags, metal and plastic containers. In 2017, AB Vasilopoulos reported collecting 1 kilotonne of plastic packaging.<sup>32</sup>

Antapodotiki meanwhile, organises and promotes the recycling of packaging across Greece. Established in 2008, the system uses recycling kiosks and a financial reward to encourage consumers to separate packaging by material stream. The payment stands at €0.03 for one item of plastic, metal or glass packaging.<sup>33</sup>

Although much progress has been made with regards to EPR for plastic packaging, the schemes are relatively limited in scope. For instance, HERRCO members only account for around 10% of the plastic produced and mainly include large multi-national companies, with a large proportion of SMEs therefore not fulfilling any EPR obligations.<sup>34</sup>

Figure 3 presents a diagram overview of the EPR system for plastic packaging in Greece.

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<sup>31</sup> Hogg, D.D., Elliott, T., Burgess, R., and Vergunst, T. (2018) *Study to Identify Member States at Risk of Non-Compliance with the 2020 Target of the Waste Framework Directive and to Follow-up Phase 1 and 2 of the Compliance Promotion Exercise*, March 2018

<sup>32</sup> ΑΒ ΒΑΣΙΛΟΠΟΥΛΟΣ (2017) *ΤΟ ΟΛΟΚΛΗΡΩΜΕΝΟ ΣΥΣΤΗΜΑ ΑΤΟΜΙΚΗΣ ΕΝΑΛΛΑΚΤΙΚΗΣ ΔΙΑΧΕΙΡΙΣΗΣ ΣΥΣΚΕΥΑΣΙΩΝ ΤΗΣ*, accessed 11 May 2020, <https://view.publitas.com/ab-gr/ethsia-ekthesh-epharmoghs-2017-alpha-bhta-basilopoylos/page/6-7>

<sup>33</sup> Antapodotiki *The System*, accessed 11 May 2020, <https://www.antapodotiki.gr/en/system>

<sup>34</sup> WWF (2019) *Plastic pollution in Greece: how to stop it. A practical guide for policy makers*, accessed 1 May 2020, [http://awsassets.panda.org/downloads/05062019\\_wwf\\_greece\\_guidebook.pdf](http://awsassets.panda.org/downloads/05062019_wwf_greece_guidebook.pdf)

**Figure 3 Overview of plastic packaging EPR in Greece**



**EPR Schemes for Other Types of Plastic**

Lastly, there are a limited number of EPR schemes for other types of plastic waste. Ecoelastica and the Hellenic Crop Protection Association (HCPA) are two such examples. Ecoelastica manages the collection, transport and recovery of end-of-life tyres. Treatment includes re-treading and used tire trading, as well as the production of rubber crumb. Ecoelastica members are companies which import tyres and vehicles. In 2019, Ecoelastica collected around 95% of end-of-life tyres in Greece.<sup>35</sup>

The Hellenic Crop Protection Association (HCPA) offers a separate management system for agri-plastics, particularly for empty plastic packaging from crop protection products such as pesticides. HCPA represents companies involved in the crop protection industry

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<sup>35</sup> ECOELASTIKA SA (2020) *Collection*, accessed 11 May 2020, <https://ecoelastika.gr/collection-of-used-tires/>

that produce, standardize and distribute plant protection products in the Greek market. Members of HCPA include 20-25 companies, together representing the majority of the market share in plant protection products in Greece.

At present, companies in the crop protection industry are included in the ERP system CAMS – RECYCLING of HERRCO. However, a separate EPR scheme for empty plastic packaging from crop protection products ('CYCLOS') is planned by HCPA. Indeed, HCPA has prepared and submitted for approval, a business plan for the development of the EPR system. HCPA has also conducted a feasibility study of a deposit refund scheme (DRS) and has initiated a pilot programme. Participants in the trial, which began in 2013, include municipalities, farmers associations, private companies/producers and local businesses for crop protection products as collection points. Data from the pilot indicates a low collection rate of less than 10%, signalling the continuation of improper practices such as disposal with MSW, landfilling and illegal burning.<sup>36</sup>

### 5.1.2 Incentives to increase separate collection of plastic

Current charging systems for solid waste management services in Greece are based on the area of households. This system does not provide incentives for waste prevention, waste minimization or recycling/participation in separate collection. The National Waste Prevention Strategic Plan (2014), currently under revision, foresaw Pay-As-You-Throw (PAYT) schemes as a means to reduce waste in landfills/enhance participation of the public in the separate collection of waste.

Indeed, in order to increase separate collection, PAYT has been trialled in Elefsina and will be trialled in Vrillissia.<sup>37</sup> PAYT is a waste management approach whereby a business or individual is subject to a fee which is linked to a quantitative measure of waste set out for collection. The system works by creating an economic incentive to reduce waste, and/or creating an economic incentive to recycle waste. PAYT schemes can also provide cost recovery, improve data gathering and efficiency of waste collection.

Under the EU LIFE+ Environment programme, the Elefsina trial comprised 1,500 households and 69 companies. The scheme involved a partial reimbursement of municipal taxes for the participants. The scheme reported an overall increase of 2.4% in separately collected recyclables, with 25.8% of waste diverted from landfill, 56% recycling rate of packaging waste and 17% of organic waste composted. However, a number of challenges were noted, including the need for legislative initiatives which

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<sup>36</sup> Hellenic Crop Protection Association (2016) *Ορθή διαχείριση κενών φιαλών φ.π.*, accessed 11 May 2020, <http://esyf.gr/index.php/draseis/orthi-diaxeirisi-kenon-fialon/>

<sup>37</sup> Source, accessed 08 June 2020: [https://www.vrillissia.gr/index.php/939-life-payt -](https://www.vrillissia.gr/index.php/939-life-payt-)

encourage the implementation of PAYT schemes, ensuring the effective collection of fees and addressing illegal dumping.<sup>38</sup>

The plan for Vrillisia is to trial the scheme across 625 households, replacing the existing container network with enclosed containers accessible only with ID cards by the participating households. The containers are identified with a chip which contains information about the owner and the volume of waste. The data is gathered during collection by waste trucks and a monthly bill is sent to the owner.<sup>39</sup>

### 5.1.3 Private sector initiatives

A range of private sector initiatives have been developed over the last few years driven by recent developments in the EU policy landscape on plastics. Product design is an important tool to improve the economics and quality of plastics recycling that require well planned and effective end of life management to gain better quality and quantity of the material.

- **‘In the Loop’ led by Plastic Thrace<sup>40</sup>**: an upcycling service to help create value from plastic waste and it’s available to all relevant stakeholders, brands and consumers. The service focuses on a) collecting plastic cups from event agencies, coffee shops, beach bars, music festivals and sports events and upcycling these into paint packaging products; b) collecting FFS used bags and upcycling these into new FFS bags via FFS film producers and polymer producers; c) collecting used fishing ropes and nets and upcycling these into new ropes and nets in collaboration with Blue Cycle. Greenhouse twines are also covered in ‘In the Loop’ initiative.
- **‘Zero Waste Beaches’ led by The Coca Cola Company<sup>41</sup>** (as part of the 3 year Zero Waste Future Programme): is an awareness raising initiative aiming to tackle plastic waste pollution across the country. The Zero Waste Beaches program, which is implemented in collaboration with the Ecological Recycling Company (Ecorec) and HERRCO, covered 9 Greek beaches in 2019 and involved the introduction of 4 recycling bins with a separate stream for plastic bottles while organising beach clean-ups, training and information programs for 27 coastal businesses and visitors regarding recycling and circular economy.

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<sup>38</sup> Vitoraki, M. (2019) *Implementation of pay-as-you-throw schemes in Greece: major benefits and future potential*, accessed 11 May 2020,

[http://uest.ntua.gr/heraklion2019/proceedings/pdf/HERAKLION2019\\_Vitoraki.pdf](http://uest.ntua.gr/heraklion2019/proceedings/pdf/HERAKLION2019_Vitoraki.pdf)

<sup>39</sup> LIFE PAYT (2017) *Actions and Means*, accessed 11 May 2020, <https://www.life-payt.eu/en/about/actions-and-means>

<sup>40</sup> <https://www.in-the-loop.gr/>, accessed 13 May 2020

<sup>41</sup> <https://www.coca-cola.gr/neversettle/aporrimmata/nea-zwi-se-plastika-boukalia-zero-waste-beaches>, accessed 13 May 2020

#### 5.1.4 Voluntary and NGO Plastic Waste Management Initiatives

Finally, there are a number of initiatives seeking to tackle plastic consumption, waste and marine pollution. With regards to consumption of single-use plastics, the following three schemes are of note:

- **Sea Change Greek Islands:** An initiative, that begun in 2018 led by the A.C. Laskaridis Foundation, is working across ten Cycladic islands, starting with Donoussa, to remove single-use plastics (cups, straws, bags, take-away packaging) and improve awareness on plastic pollution and SUP items aiming to protect the marine environment.<sup>42</sup>
- **Clean Blue Paros:** a programme led by Clean Blue Alliance, run by Common Sea, commenced in 2018, based in Paros. The aim is to reduce single plastic usage at local level and to become one of the first islands in Greece free from plastic waste. The project brought together Common Seas, WWF Greece, Paros municipality and other partners (WATT S.A., CPF) to implement a programme of activities focused on reducing single-use plastic consumption and the effective collection of plastic waste.<sup>43</sup>
- **Alonissos without Plastic Bags:** in 2015, prior to the national legislation, Alonissos banned the use of plastic bags, aiming to make Alonissos the first plastic bag-free island in Greece. As part of the project, fabric bags were distributed to households and numerous educational activities were run including beach clean-ups.<sup>44</sup>

Initiatives addressing abandoned fishing gear and marine plastic pollution more generally, include for instance:

- **Healthy Seas and Ghost Diving:** these organisations founded an initiative between diving companies based in Santorini which aims to recover lost fishing gear from the sea. Aquafil recycles the recovered nets, together with other nylon waste into yarn for the fashion and interior design

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<sup>42</sup> A.C. Laskaridis Foundation (2019) *Donoussa: the first aegean island without single-use plastic*, accessed 11 May 2020, <https://www.aclcf.org/press>

<sup>43</sup> Common Seas (2020) *Clean Blue Paros*, accessed 11 May 2020, <https://commonseas.com/countries/clean-blue-paros>

<sup>44</sup> Thalassa Foundation *Blue Alonissos: A Sustainability Example*, accessed 11 May 2020, <http://www.thalassafoundation.com/en-GB/initiatives/blue-islands-of-greece/blue-alonissos>

industry. In 2019, three tonnes of ghost nets were removed from the seabed in Stratoni, a small fishing town in Northern Greece.<sup>45</sup>

- **Blue Cycle:** an initiative run by the Aikaterini Laskaridis Foundation aiming to reuse marine plastic waste generated from shipping and fishing activities (i.e fishing nets). The project involves processing marine plastic into pellets for the plastic industry and 3D printing filament, as well as research and awareness raising.<sup>46</sup>
- **Cyclades Preservation Fund:** a charity established to support sustainable initiatives and to promote the preservation of Cyclades.
- **Enaleia:** a social enterprise which trains fishermen to collect plastic from the sea. During the October 2018 - May 2019 fishing period, 10 fishing boats cleaned 16 tonnes of marine litter, from which 83% was plastic and 5,000kg of fishing nets were upcycled.<sup>47</sup>

### 5.1.5 Summary

In summary, there are a number of practices, policies and initiatives in place in Greece which seek to either influence or directly address marine plastic pollution. Crucially, the majority of municipal waste goes to landfill, whilst HERRCO is the key stakeholder with regards to EPR and separate collection of plastic packaging waste. Private and voluntary initiatives are also working to both prevent plastic waste and to clean up marine plastic pollution.

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<sup>45</sup> Healthy Seas (2019) *Greece: Divers pull out 2 tons of ghost nets from highly biodiverse area*, accessed 11 May 2020, <https://www.healthyseas.org/2019/05/21/greece-divers-pull-out-2-tons-of-ghost-nets-from-highly-biodiverse-area/>

<sup>46</sup> BlueCycle (2019) *BlueCyle*, accessed 11 May 2020, <https://bluecycle.com/en/bluecycle-lab/>

<sup>47</sup> Enaleia *Enaleia – Επαναπροσδιορίζοντας την Αλιεία*, accessed 11 May 2020, <https://enaleia.com/en/homepage/>

## 6.0 Policy Measures

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Based on the review above, and drawing on sources in the literature (including Eunomia and WWF Greece's previous work in this area), a longlist of measures to improve the circularity of plastics in Greece was developed for Greece to address. Plastic packaging and single use plastics were the main categories of plastics in scope, though measures to tackle other key sources of plastic (fishing gear, agricultural plastics, microplastics) were also assessed. In terms of the point of application for the measures considered, a value-chain approach was taken, focussing on improvements in the end of life management of plastics, and including actions that could be implemented higher up in the supply chain (consumption and production stages) to prevent plastic waste generation. In addition, horizontal measures to improve waste collection services and treatment options in line with the waste hierarchy were also included.

The longlist was refined through a strategic analysis of the need for implementation in Greece's particular context, the likely impacts of measures, and the feasibility of implementation in the short/ medium term. The final shortlist of measures (17), as listed in Table 3, was established through discussions with WWF Greece, and was based on the following key principles for prioritisation:

- Prevent plastic waste being generated in the first place;
- Encourage higher levels of recycling of plastic; and importantly;
- Prevent plastic waste becoming littered.

The sections below include a brief description of the specific actions proposed in the Greek context under each shortlisted measure, as well as the rationale for their inclusion, the likely impacts, and the key elements for successful implementation. It is noted that the design of specific measures, and a detailed impact assessment of each one is beyond the scope of this work.

Thus, the section below is structured as follows:

- Summary of Shortlisted Policy Measures presented in Table 3;
- Section 6.1 Measures to Reduce Consumption;
- Section 6.2 Measures to Improve End of Life Management of Plastics;
- Section 6.3 Measures to Improve Circularity I Production;
- Section 6.4 Horizontal Waste Management Measures.

**Table 3 Summary of shortlisted policy measures**

Note: It is worth noting that the impacts are likely to be felt across the supply chain in most cases – we’ve just classified here on the basis of the main point of impact.

Point of application	Measure	Description	Relevant plastics	Priority
Consumption	<a href="#">SUP Bans with Levies on SU Alternatives as per Directive (EU) 2019/904</a>	Best practice in the implementation of the Directive regarding the enforcement of bans (transparent, phased approach with good enforcement), charges/ levies to reduce consumption of single use alternatives (and incentivise multi-use that can be managed in local waste systems), and supply chain engagement to minimise adverse impacts and monitoring/ evaluation of activities.	SUPs	High
Consumption	<a href="#">Nationwide Potable Water/ Refill Schemes</a>	Increase access to/ quality of potable water (piped + public access) to reduce reliance on SUP water bottles.	SUPs	Medium
Consumption	<a href="#">Microplastic Prevention/ Reduction Measures</a>	Develop understanding of scope and scale of microplastic pollution issue in order to develop framework of solutions for particular types.	Micro-plastics	Low
Consumption	<a href="#">Reduce SUP Consumption through Green Public Procurement</a>	Implementation of legislation to underpin development of standards/ guidelines incorporating CE principles– reusability, recyclability, recycled content, consideration of applicable sectors (direct/ indirect procurement), available end of life management options and full lifecycle costs of different alternatives.	SUPs	High
End of Life Management	<a href="#">Improve Existing EPR Scheme for Packaging</a>	Current proposals for reform should include increase in and modulation of fees, expansion of scheme to cover all producers and prevent freeriding, reconfiguration of operational/ financial roles and responsibilities to improve efficiency.	Packaging	High
End of Life Management	<a href="#">DRS for Beverage Containers</a>	Implementation of DRS is linked to its likely impact – a well-designed scheme can have significant benefits in the form of increased recycling rates, reduced littering of deposit-bearing containers, a reliable supply of high-quality recycled material, reduced greenhouse gas emissions and air pollutants; and increased employment.	SUPs	High

<b>End of Life Management</b>	<a href="#">Agricultural plastics EPR</a>	Recommendations for improved implementation of current proposals, including expanding EPR to cover end of life costs of agriplastics beyond bottles/ some kinds of films (e.g. drums, sacks, piping, etc.). Also suggests careful consideration of design of DRS mechanism within EPR scheme to support material take back and system uptake in geographically remote contexts. .	Packaging	Medium
<b>End of Life Management</b>	<a href="#">Fishing Gear (Nets) EPR</a>	Improvement in existing collection systems and upscaling of current programmes to recycling fishing gear to enable EPR.	Fishing Gear	Medium
<b>End of Life Management</b>	<a href="#">Improve Non-Packaging Plastic Waste Collections</a>	Improvement of systems/ infrastructure for waste collection at port reception facilities, bulky waste management systems and seasonal waste management plans to handle increase in waste arisings during tourism peak.	All Plastics	Medium
<b>End of Life Management</b>	<a href="#">Develop 'On-the-Go' Waste Collection for Recycling</a>	Improve street cleansing (frequency of street sweeping), as well as provision of high-spec on-the-go recycling bins.	Packaging	Low
<b>End of Life Management</b>	<a href="#">Maximise Sorting of Plastics from Residual Waste</a>	Consider most suitable treatment processes, for example, maximizing 'sorting' in waste treatment facilities would consequently result in lower plastic content of the outputs/ residues.	All Plastics	Low
<b>Production</b>	<a href="#">Financial Incentives for Producers</a>	Incentivising recycled content uptake/ innovation in plastic alternatives (e.g. through taxes/ tax rebates/ grants).	Packaging	Medium
<b>Production</b>	<a href="#">Improve Packaging Labelling Standard</a>	Ensure alignment with national waste management operations, reduce consumer confusion regarding recyclability/ compostability.	Packaging	Medium
<b>Horizontal</b>	<a href="#">Tax Incentives in Line with Waste Hierarchy</a>	Repeal of environmental fee and implementation of landfill tax.	All Waste	High
<b>Horizontal</b>	<a href="#">Accountability Mechanisms for Mis-managed Waste</a>	Channelling additional funding from PAYT, EPR, landfill tax, etc. to improve enforcement and increase penalties associated with illegal dumping, fly-tipping, and other forms of waste crime. Improvement of monitoring systems including digital tracking of waste.	All Waste	High

<b>Horizontal</b>	<a href="#">Scale up Pay as you Throw Initiatives</a>	Recommendations regarding the design and implementation of PAYT in Greece to improve recycling performance.	All Waste	High
<b>Horizontal</b>	<a href="#">Implement National Packaging Register</a>	Development of national registry to incorporate information needed for EPR scheme as well as additional information to improve monitoring/ compliance checks/ research.	Packaging	High

## **6.1 Measures to Reduce Consumption**

### **6.1.1 Implement SUP Bans with Levies on SU Alternatives as per Directive (EU) 2019/904**

As set out in Section 4.2, the Greek government is currently in the process of transposing the EU SUP Directive into national law in Greece. In doing so, it is likely that the bans on specific items proposed by the SUP Directive under Article 5 (Appendix A.2.0) will be implemented, alongside consumption reduction measures for food containers and beverage cups as stipulated under Article 4 (Appendix A.1.0). The success of these measures will be directly linked to their implementation and enforcement.

Consequently, the subject of this measure is the proper implementation of the Directive and what supporting instruments might be needed to ensure the best overall outcome.

It is noted that while bans are a common intervention aiming to reduce the use of, and pollution from, SUP products in countries around the world, there is a widespread evidence-gap on their effectiveness. There are significant differences in their impacts which are correlated to a number of variables including implementation and enforcement. There is no scope for raising any revenue through bans, with the exception of financial penalties for offending organisations. However, there could be significant costs of the ban arising through its implementation and enforcement. These might be direct costs such as policing and indirect costs such as the loss of jobs. However, the impact assessment of the SUPD found that overall net benefits would be generated from the specific bans included in the Directive.

The implementation of SUP bans alongside a system of levies to nudge consumer behaviour towards preferred alternatives can mitigate against some of the risks associated with bans, such as a move to other single use alternatives that are subject to littering, and potentially cause problems for existing waste management processes. Levies can also be introduced in a phased, flexible manner (as has been the case with carrier bag charges), to ensure incremental impact over time and responsiveness to wider economic considerations.

An important further point is that a levy will align the interests of the retailer with those of the Government in seeking to reduce consumption. Taking single-use coffee cups as an example, a charge that encourages customers to bring their own will mean the retailer saves money for each disposable cup they are not required to 'give away'. In some places, smaller retailers are able to keep the proceeds of the charge, which would be additional to the saving from the avoided provision of a disposable cup. This means that the greater the reduction, the greater the benefit to the retailer (plus the consumer should ultimately see a reduction in the price of the coffee as cost of the 'free' disposable cup provided would have been covered by the overall cost). By contrast, where certain SUP items are banned, the apparent single-use alternatives, such as biodegradable or compostable cups are often more expensive, meaning that the ban

would lead to a negative financial impact for the retailer, as well as for waste management systems that are likely to struggle to manage such waste streams.

Consequently, the following actions are proposed for Greece:

- 1) Consideration of similar consumption reduction measures for SUP items beyond the scope of the SUP Directive should be given, based on the presence in beach litter and/or national consumption patterns, and the availability of alternatives.
- 2) Ensuring that the relevant bans are fully implemented and strictly enforced – the ban should apply to the manufacture, production, distribution, sale, possession and import of the relevant items and should be brought into force in a phased, transparent manner to allow the market sufficient time to adjust and engage with the policy. It is important to note that the correct enforcement of bans is often costly, and is reliant on the availability of suitable alternatives as well as careful consideration of the likely impacts of the ban on different groups in society.
- 3) Ensuring that incentives are in place to ensure that demand for the relevant SUP items is not simply shifted to other, potentially damaging single use products and that multi-use alternatives are prioritised. This could include the introduction of charges/ levies on single use non-plastic alternatives (e.g. paper straws that replace plastic ones) to encourage consumers to switch to reusable/ bring-your-own systems (e.g. stainless steel straws). The revenue from such levies could be used to offset the costs to retailers associated with the reduction of SUPs, or could be ringfenced to support enforcement of the measure.
- 4) Consulting the waste management sector regarding the alternatives being incentivised. As certain SUP products are banned/ reduced, national waste management processes must be able to effectively manage their replacements. This may require further regulatory guidance, standards, or infrastructure, such as facilities for industrial composting or anaerobic digestion.
- 5) Putting in place a clear, transparent system for data collection and monitoring regarding the effectiveness of specific measures, as presented under Section 1.3.4 Implement National Packaging Register.

### **6.1.2 Implement Nationwide Potable Water/ Refill Systems**

In order to reduce the consumption, waste and litter associated with on-the-go single use plastic bottles in Greece, particularly during the tourist season, this measure proposes the nationwide expansion of existing programmes that focus on the development of refill networks and access to public drinking water, such as water fountains (e.g. see section 0, Clean Blue Paros). On a larger scale, this includes improvements in existing potable water systems to eliminate the need for plastic water bottles for domestic consumption. This is particularly relevant on Greece's islands,

where the installation of small-scale community desalination plants in cooperation with bottlers can have significant results, as has been the case in Lipsi municipality.<sup>48</sup>

No data was available/accessible regarding the impacts of introducing a potable water supply on the consumption of bottled water, and hence, on the waste generation of plastic beverage bottles. However, the literature does suggest some of the key elements of such programmes that increase their uptake. For example, a study was undertaken to compare consumer attitudes towards tapped water in Riga, Latvia where there are issues with water quality, and Nicosia, Cyprus where continuity of supply is an issue. This study found that for the most part, reliability of supply takes precedence over water quality, but when reliability is no longer in question, quality becomes the most important factor in determining uptake of a potable water system.<sup>49</sup>

This suggests that the installation of fully functioning and properly maintained potable water supply systems that provide a reliable and clean supply of water, considering including water mineralises, supplemented by information campaigns that highlight the quality of the water, will ensure the greatest uptake. Similarly, refill programmes are likely to be successful when networks are widespread and reliable, and where effective signposting of refill locations exists, through the use of apps or window signs for instance.

It is noted that the impacts of such measures are likely to be most significant for bottlers and retailers, who will experience reduced sales of bottled water. For retailers, this may be offset by the increased customer footfall associated with participating in refill schemes. Additionally, costs to municipalities will increase, associated with the improvement and maintenance of public water and potable water systems – though in Greece, such costs may be passed on to consumers in the form of tariffs. Finally, it is noted that these measures will impact the consumption of plastic water bottles only – plastic bottle consumption for soft drinks, etc. is unlikely to be impacted, though incentivising the uptake of soft drink refill stations and technologies like sodastream<sup>50</sup> for households may change this.

In summary, the following actions are proposed for Greece:

- 6) Improve network of refillable stations through nationwide expansion of existing programmes that focus on the development of refill networks and access to public drinking water, such as water fountains;

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<sup>48</sup> <https://www.newgreektv.com/news-in-english-for-greeks/greece/item/25961-lipsi-is-the-first-city-in-greece-to-remove-plastic-bottles>

<sup>49</sup> Chenoweth, J., Barnett, J., Capelos, T., Fife-Schaw, C., and Kelay, T. (2010) Comparison of Consumer Attitudes Between Cyprus and Latvia: An Evaluation of Effect of Setting on Consumer Preferences in the Water Industry, *Water Resources Management*, Vol.24, No.15, pp.4339–4358

<sup>50</sup> <https://sodastream.co.uk/>

- 7) Ensure reliability of supply through the Regional or Local Authority and water quality through the Association of Municipal Water Companies (E.Δ.E.Y.A)<sup>51</sup> and the General Chemical State Laboratory of Greece<sup>52</sup>;
- 8) Incorporate actions in municipalities' Local Action Plans, aiming to reduce plastic waste and litter;
- 9) Ensure installations of potable water systems on islands & remote areas;
- 10) Introduce awareness raising campaigns that highlight the quality of the water to ensure the greatest uptake. Introduce effective signposting of refill locations, through the use of apps or window signs for instance;
- 11) Refill programmes are likely to be successful when networks are widespread and reliable.

### 6.1.3 Implement Microplastic Prevention/ Reduction Measures

This measure encompasses a range of actions to tackle the issues associated with microplastic pollution in Greece. While the available literature (see Section 3.1.2) suggests that microplastics are a significant source of pollution along Greek coastlines, there are currently no policy measures in place to tackle the issue, and national research into the sources, types and pathways of such pollution is limited. Therefore, as a preliminary step to any policy action, there is a need for detailed studies and stakeholder engagement to understand the issue of microplastic pollution in Greece, including consideration of the stocks and flows of both intentionally added sources of microplastics (e.g. microbeads in cosmetics/ detergents) and unintentionally produced microplastics (e.g. tyre dust).

Previous high-level estimates have suggested that tyre dust is a significant source of plastic pollution in Greece, even when compared against macroplastics like carrier bags and beverage bottles. In addition, clothing fibres and microbeads were identified as potentially significant sources of microplastic pollution in the country.<sup>53</sup> Therefore, subject to further research to refine these estimates, short/ medium term policy actions could include limiting microplastic pollution associated with microplastics intentionally added to products, such as a ban on microbeads in hygiene products, as well as a supply chain approach to developing pre-production plastic pellet handling regulations.

Pre-production pellet handling regulations would incorporate the best-practice measures and standards identified in Operation Clean Sweep and would apply to producers, converters and transporters of pellets, potentially including:

- regulation on the transport of pellets, which would see all operators undertaking transportation of pellets required to implement best practice approaches e.g. use

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<sup>51</sup> <https://edeysa.gr/>, <https://edeysa.gr/>

<sup>52</sup> [http://www.gcsf.gr/index.asp?a\\_id=3](http://www.gcsf.gr/index.asp?a_id=3)

<sup>53</sup> Eunomia for Common Seas (2019), Plastic Drawdown, accessible at <https://commonseas.com/projects/plastic-drawdown>

of appropriate storage containers that prevent leakage/ residual leakage of pellets during transport, loading and unloading;

- regulation on plastic converters, aimed at ensuring best-practice measures are put in place to prevent pellet loss e.g. at loading and unloading points and during storage in facilities;
- regulation requiring supply chain accreditation of adherence to best-practice. This regulatory measure would require those placing plastics on the market (large businesses in the first instance) to ensure their entire supply chain demonstrates best practice in the prevention of pellet loss.

These regulations would involve regular audits along the entire supply chain to ensure that best practice measures to prevent pellet loss, and clean up any pellet spills, are being implemented and adhered to. If implemented well and applied to all producers (including SMEs) placing plastic on the market, Eunomia's previous work or the European Commission on Options to Address Microplastic Release<sup>54</sup> suggests that this could lead to a ~95% reduction in emissions, depending on implementation. Should the intervention be enforced well but only to large handlers of plastic pellet and their supply chains, or enforced moderately across all producers (including SMEs) the impact is likely to depend on the structure of the market in terms of the size of the supply chain and producers within it, and could result in a ~50%-70% reduction in plastic pellet emissions.

Regarding a ban on the manufacture, sale and import of products containing microbeads, a 100% reduction in emissions could theoretically be expected, though the success of the measure is linked to a number of variables. Key among these is the availability of suitable alternatives. For example, following the UK ban on the sale and manufacture of microbeads in rinse-off cosmetics, manufacturers began investigating natural alternatives. These included nut shells, salt and sugar.<sup>55</sup> When considering the available alternatives, it must be noted that many items labelled as being "biodegradable" do not decompose, or at least at considerably slower rates, in the marine environment. Indeed, the UK ban on microbeads in cosmetics also includes biodegradable plastics, as there is some evidence to show that bio-plastics do not degrade quickly enough in marine environments to prevent damage.<sup>56</sup>

In the longer term, further action could be taken to ban intentionally added microplastics in the form of artificial turf, as has been proposed by the European

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<sup>54</sup> Eunomia & ICF (2018), Investigating Options for Reducing Releases in the Aquatic Environment of Microplastics Emitted by Products, accessible at <https://www.eunomia.co.uk/reports-tools/investigating-options-for-reducing-releases-in-the-aquatic-environment-of-microplastics-emitted-by-products/>

<sup>55</sup> Department for Environment Food and Rural Affairs; (2016) *Microbead ban announced to protect sealife*, accessed 8 November 2018, <https://www.gov.uk/government/news/microbead-ban-announced-to-protect-sealife>

<sup>56</sup> UK Statutory Instruments 2017 No. 1312, The Environmental Protection (Microbeads) (England) Regulations 2017, accessible at <https://www.legislation.gov.uk/uksi/2017/1312/made>

Chemicals Agency (ECHA)<sup>57</sup>, and to develop standards and thresholds for acceptable levels of microplastic release from unintentional sources (such as clothing fibres and tyre dust), as suggested in previous work for the European Commission<sup>58</sup>. However, these are relatively novel measures at present, the impacts of which have previously been estimated to range from a 5%-50% reduction in emissions depending on implementation and enforcement.<sup>59</sup>

In summary, the following actions are recommended for Greece in the short term:

- 12) Carry out detailed studies and stakeholder engagement to understand the issue of microplastic pollution in Greece's context;
- 13) Implement pre-production pellet handling regulations; and
- 14) Introduce a ban on the manufacture, sale and import of products containing microbeads.

#### **6.1.4 Reduce SUP Consumption through Green Public Procurement**

Green public procurement (GPP) can be a powerful tool to reduce plastic waste, stimulating demand for recyclable, reusable alternatives and models and recycled content uptake. It is understood that at present, Greek ministries are currently in the process of preparing legislation underpinning green public procurement practices in the country, though the country had yet to implement a GPP national Action Plan in 2018.<sup>60</sup> A consultation process on GPP will commence shortly and it will be accompanied by the draft national Action Plan for GPP.

When introducing green public procurement standards and guidelines in Greece, it is proposed that improved circularity in plastic consumption be considered not only in the procurement of products (packaging, furniture, office supply and IT), but also services (such as cleaning services, waste management services, etc.). This should include indication of clear preference for materials that are reusable (e.g. glasses in place of disposable cups), readily recyclable in local waste management operations, and which include recycled content. In addition, clear methods for verification of such criteria should be developed, as well as monitoring of the impacts (a high collection and recycling target for publicly procured plastics).

It is noted that the inclusion of such criteria can be associated with increased short-term costs, though in the long term, the business case for change and subsequent

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<sup>57</sup> European Chemicals Agency (ECHA), Registry of Restriction Intentions – Microplastics, accessible at <https://echa.europa.eu/registry-of-restriction-intentions/-/dislist/details/0b0236e18244cd73>

<sup>58</sup> Eunomia & ICF (2018), Investigating Options for Reducing Releases in the Aquatic Environment of Microplastics Emitted by Products, accessible at <https://www.eunomia.co.uk/reports-tools/investigating-options-for-reducing-releases-in-the-aquatic-environment-of-microplastics-emitted-by-products/>

<sup>59</sup> Eunomia for Common Seas (2019), Plastic Drawdown, accessible at <https://commonseas.com/projects/plastic-drawdown>

<sup>60</sup> [https://ec.europa.eu/environment/gpp/pdf/GPP\\_NAPs\\_June\\_2018.pdf](https://ec.europa.eu/environment/gpp/pdf/GPP_NAPs_June_2018.pdf)

procurement decisions should consider environmental and social impacts as well as financial costs. In many cases, evidence suggests that the increased costs associated with a switch from disposable plastics to reusable alternatives are recovered after a relatively low number of uses. While the direct impact of public procurement measures on plastic consumption and circularity varies from case to case, it provides a mechanism for taking responsible action on plastic by supporting the decision-making processes within the public sector, sending a clear signal to incentivise producers/ consumers to change their practices. It can also be an area for relative “quick wins”, providing public authorities with opportunities for engagement with and understanding of the issues associated with plastics.

In summary, the following actions are recommended for Greece:

- 15) Improve circularity in plastic consumption not only in the procurement of products (packaging, furniture, office supply and IT), but also services (such as cleaning services, waste management services, etc.) via development of standards and guidelines.
- 16) Indicate clear preference for materials that are reusable (e.g. glasses in place of disposable cups), readily recyclable in local waste management operations, and which include recycled content.
- 17) Develop clear methods for verification of such criteria, as well as monitoring of the impacts (i.e. a high collection and recycling target for publicly procured plastics).
- 18) Build business case for change and subsequent procurement decisions should consider environmental and social impacts as well as financial costs.
- 19) Provide public authorities with opportunities for engagement with and understanding of the issues associated with plastics, via guides and seminars/webinars, knowledge sharing opportunities/ networks, etc.

## 6.2 Measures to Improve End of Life Management of Plastics

### 6.2.1 Improve Existing EPR Scheme for Packaging

As described in Section 5.1.1, the current EPR scheme for packaging waste has made significant progress in Greece, though currently undermined by limited consumer engagement and producer representation. The scheme is currently being revised accordingly and is a political priority.

Concerning fee modulation, It is difficult to determine the extent to which fee modulation to date has contributed to stimulating changes to product or packaging design. In part this is due to the limited application of fee modulation, and also a lack of detailed evaluation. France, modulated fees have been associated with an increase in

the use of packaging with sorting instructions attached, while the use of PVC bottles has declined<sup>61</sup>.

It is proposed that the system could be significantly improved if the existing requirement for all producers to register with a PRO and contribute fees was better enforced (including for importers), including for all forms of packaging (primary, secondary and tertiary). Particular actions should be taken to reduce the amount of freeriding of the system that currently takes place. In addition, considerable improvements shall be made to the current collection system by increasing the fees charged to producers (currently some of the lowest in Europe) to cover the full costs of end of life management, including litter (in line with EU policy). These should be further modulated so that producers of the least recyclable forms of packaging are charged at a higher rate to properly reflect the polluter pays principle and to incentivise packaging design changes that incorporate recycling, recycled content, and reuse.

These actions would significantly increase the amount of funding available for the optimisation of existing waste collection and management systems in line with the needs of municipalities. In this regard, the development of optimal waste collection systems should not be constrained by the funds made available by producers – conversely, the fees charged to producers should be determined on the basis of the necessary costs required to deliver a well-functioning waste collection, transport, and treatment system, which should be determined by municipalities.

Such improvements in waste service delivery should be accompanied by consumer awareness programmes, as well as incentives to ensure correct waste separation by households (penalties/ fines for repeated offences related to contamination of recyclables/ lack of separation, pay as you throw schemes (see Section 6.4.3), etc.).

In summary, the following actions are recommended for Greece:

- 20) Increase in and modulation of fees to achieve full cost coverage in line with EU requirements;
- 21) Expansion of scheme to cover all producers and importers/ online retailers in order to prevent free riding (with no exemptions regardless of business size)
- 22) Reconfiguration of operational/ financial roles of key stakeholders
- 23) Assign clear responsibilities (MoEE, EOAN, Waste Management Authorities, Local Authorities, Waste Treatment Plant operators) to improve efficiency.
- 24) 100% geographical coverage of the packaging waste system (blue bin system) to increase accessibility

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<sup>61</sup> European Commission (2020), Study to Support Preparation of the Commission’s Guidance for Extended Producer Responsibility Schemes, accessed 8 June 2020, [https://ec.europa.eu/environment/waste/studies/pdf/DG%20Env%20EPR%20Guidance%20-%20Final%20Report\\_FOR%20PUBLICATION.pdf](https://ec.europa.eu/environment/waste/studies/pdf/DG%20Env%20EPR%20Guidance%20-%20Final%20Report_FOR%20PUBLICATION.pdf)

- 25) Improve/Upgrade equipment for all municipalities (where containers are lost or damaged)
- 26) Update/Improve awareness raising through national/local campaigns and/or programmes

## 6.2.2 Ensure Implementation of DRS for Beverage Containers

As the MoEE (ΥΠΕΝ) is currently preparing the adoption of the SUP Directive, the introduction of new economic instruments, including a DRS for one-way (non-refillable) beverage containers is being incorporated in the upcoming national legislation.

The implementation of DRS is linked to its likely impact – a well-designed scheme can have significant benefits in the form of increased recycling rates, reduced littering of deposit-bearing containers, a reliable supply of high-quality recycled material, reduced greenhouse gas emissions and air pollutants; and increased employment.

The success of a system depends on the design chosen and the introduction of collection or return rate targets. Generally, however, the return rate will primarily depend on the value of the deposit to the consumer and the ease of returning the used beverage containers for a deposit refund.

The most effective systems are run by the beverage industry as a form of producer responsibility, with a minimal role for the Government. In many cases, the Government legislates to require a deposit to be charged on certain beverage containers and sets a minimum recycling target but the remaining details are left to the system operator to determine.

When introducing a DRS, the industry must be given time to agree on the selected design, to put in place the necessary systems, infrastructure and people, and to change the container labels to incorporate the deposit logo. It is also important to communicate the benefits to producers, particularly in terms of the positive reputational image and increased supply of material for new containers. Time is similarly needed to communicate with consumers, both the reasons for introducing the DRS, the benefits it will bring for the country and how they can claim a full refund on the deposit.

In summary, the following actions are recommended:

- 27) Clearly design, through roundtable discussions and a feasibility study the DRS and the introduction of collection or return rate targets, having assessed a) the value of the deposit to the consumer and b) the ease of returning the used beverage containers for a deposit refund;
- 28) Allow time to consult and agree on the selected design, to put in place the necessary systems, infrastructure and people, and to change the container labels to incorporate the deposit logo;
- 29) Allow time to communicate with consumers the process, benefits and ways of participation.

Specifically, the actions for a successful DRS cover:

- Beverage producers initiate the deposit by paying it into the system operator's account.
- Retailers pay the deposit to producers/ distributors at the wholesale stage.
- Consumers pay the deposit to retailers, along with the price of the beverage.
- Consumers claim a full refund when they return their used beverage container to a designated return location.
- The return location is reimbursed for the refunded deposit from the deposit account.
- The returned used beverage containers are transported to a central location to be processed and recycled. The material can be used to manufacture new containers.

### 6.2.3 Implement EPR Scheme for Agricultural Plastics

Section 5.1.1 outlines that several pilots are already underway for the development of a dedicated agri-plastics EPR scheme in Greece. This has included consideration of key streams like plastic bottles and films, and included deposit return scheme elements, though the results of such pilots suggest limited success so far. This can largely be attributed to the lack of end of life waste management options (mainly burning/landfilling) and collection infrastructure at present, though the forthcoming legislation should change this.

The Ministry of Environment and Energy (ΥΠΕΝ) (with support from the Ministry of Agricultural Development and Food) will be leading the revision of the national legislation in order to introduce new EPR schemes for pesticide plastic packaging and greenhouse films (the latter via a Joint Ministerial Decision).

The Ministry of Energy & Environment is in the process of drafting a Joint Ministerial Decision (JMD) that will enforce producers' responsibility according to EU Directives and national legislation and will provide the framework for the creation of an EPR scheme for agricultural film producers. Producers have formed a working group team under the auspice of the Association of Hellenic Plastic Industries to prepare the establishment of such a scheme.

The Hellenic Recycling Agency (EOAN) will approve the introduction of two EPR schemes for pesticide plastic packaging and greenhouse films.

To ensure that the EPR scheme developed has a strong positive impact in reducing mismanaged waste and promoting recyclable formats, it will be important for the collection system to be designed to include waste producers in remote locations/ islands that currently have no access to separate collection points. In addition, the focus at present is on agricultural films and pesticide packaging, though other forms of agricultural plastic could be considered for inclusion upfront to ensure that the collection scheme designed is efficient from the outset (e.g. twines, nets, piping, drums, etc.). As with the packaging EPR scheme, all producers should be included, and smaller retailers could additionally be engaged to provide collection points/ take-back schemes. The issue of unavoidable contamination and the limited recycling options this presents will have to

be considered (particularly for films), as well as the role of biodegradable plastics in this regard.

In summary, the following actions are recommended:

- 30) Introduction of EPR scheme for agricultural films and pesticide packaging following full assessment of the design, key stakeholders involved, implementation, associated costs, collection/recycling/recovery of agrifilms and pesticide packaging waste;
- 31) Closely monitoring /verification by EOAN (via the Electronic Registry);
- 32) Ensure EPR scheme is designed to provide 100% geographical coverage - include waste producers in remote locations/ islands that currently have no access to separate collection points;
- 33) All producers should be included, and smaller retailers could additionally be engaged to provide collection points/ take-back schemes;
- 34) Consider for inclusion upfront to ensure that the collection scheme designed is efficient from the outset (e.g. twines, nets, piping, drums, etc.);
- 35) Exchange of good practices with EU MS that have successfully implemented similar EPR schemes (i.e. France, Ireland, Spain)

#### **6.2.4 Implement EPR for Fishing Gear (Nets)**

Section 5.1.3 sets out a range of voluntary initiatives that are currently in place in Greece to recover and treat end of life fishing gear – these are largely focussed on the recovery of fishing gear that has already been discarded in the marine environment, with limited initiatives focussing on the prevention of fishing gear loss. In line with the EU plastics strategy, it is proposed here that an EPR scheme for fishing gear should be considered in Greece, as should the development of domestic collection/ recycling infrastructure to facilitate this (at present the fishing gear collection. Recycling systems in Norway and Iceland accept some material from Greece).

Section 6.4.4 outlines the need for improved separate waste collection and storage facilities at port reception facilities, which should be considered alongside the current structure of contracts in place for the transport and treatment of waste collected at port facilities. Engagement with the current voluntary programmes that are collecting and processing such waste will be important in identifying end markets and identifying the streams that could be collected in the short terms (nets, but could also include buoys, traps, etc.). In addition, because of the relatively high value for some retrieved materials, the fee structure for any such EPR scheme should be innovative, focussed on incentivising improved fishing gear design and gear retrieval options, alongside a DRS approach to ensure collection efficiency. The informal fishing sector in Greece, as well as the geographical distribution of the sector will be important considerations in ensuring uptake of the scheme.

In summary, the following actions are recommended:

- 36) Introduce EPR scheme for fishing gear following full assessment of the design, key stakeholders involved, implementation, associated costs, collection/recycling/recovery of the fishing gear;

- 37) Close monitoring /verification by EOAN ( via the Electronic Registry);
- 38) Engagement with current voluntary programmes that are collecting and processing such waste will be important in identifying end markets and identifying the streams that could be collected in the short terms (nets, but could also include buoys, traps, etc.);
- 39) Fee structure for any such EPR scheme should be innovative, focussed on incentivising improved fishing gear design and gear retrieval options, alongside a DRS approach to ensure collection efficiency.

The informal fishing sector in Greece, as well as the geographical distribution of the sector will be important considerations in ensuring uptake of the scheme.

## 6.2.5 Improve Non-packaging Plastic Waste Collection Systems

Alongside the proposed improvements to household waste collection systems included here, this measure includes actions to improve the collection and recycling of non-household plastic streams, including separate collection and storage of shipping/ fishing waste plastics and bulky waste (such as furniture, toys, etc.).

In the case of the former, this includes alignment with the measures set out in the Commission's revised PRF Directive<sup>62</sup>, which address sea-based sources of marine litter (including plastic household waste from ships and derelict fishing gear) with measures to ensure that this waste is not discharged at sea, but landed in ports to adequate waste reception facilities. This includes provisions for separate collection to facilitate reuse and recycling of waste from ships in ports, which will be particularly relevant for plastics.

As regards bulky waste collections, at present these tend to be mixed with green/garden bulky waste and disposed of at landfill (in the majority of the cases). Currently, efforts are made towards separate collection of bulky waste with respect to the development of municipal/ local 'green points' where sorting of bulky waste per stream may be provisioned. In this context, it is proposed the separate collection of bulky waste in the planned 'green points' or other appropriate facilities aiming at maximizing sorting, reuse and recycling of materials including plastics.

Finally, this could also include the development of guidelines for municipalities to manage seasonal increases in municipal waste generation associated with tourism, including, for example, guidelines on implementing the waste hierarchy and case studies of best practice for tourist accommodation, events and spaces. On a larger scale, waste collection service contracts could be modified to include enhanced service provision during peak tourism months (including more frequent collections, increased bin provisions, etc.). However, it has long been recognised that improved infrastructure for final waste treatment (focussed on recycling) is crucial to ensuring Greece can continue to cope with the high levels of tourism it experiences annually.

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<sup>62</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0883&from=IT>

In summary, the following actions are recommended:

- 40) Improve/increase the collection, sorting and recycling of non-household plastic streams, including separate collection and storage of shipping/ fishing waste plastics and bulky waste (such as furniture, toys, etc.);
- 41) Alignment with the measures set out in the Commission's revised PRF Directive: ensure that this waste is not discharged at sea, but landed in ports to adequate waste reception facilities;
- 42) Introduce separate collection of bulky waste in the planned 'green points' or other appropriate facilities aiming at maximising sorting, reuse and recycling of materials including plastic;
- 43) Develop guidelines for municipalities to manage seasonal increases in municipal waste generation associated with tourism, including, for example, guidelines on implementing the waste hierarchy and case studies of best practice for tourist accommodation, events and spaces;
- 44) Improve Green Procurement for C&D plastic waste – introduce/embed strict specification criteria in construction contracts.

## 6.2.6 Develop and Implement 'On the Go' Waste Collection for Recycling

This measure includes actions related to the provision of separate bins for recyclable waste generated on-the-go in public areas, to prevent littering and to encourage separation from other, non-recyclable forms of waste. This includes the provision of regular maintenance services (to empty bins and provide street sweeping) as well as a minimum standard for the bins themselves to prevent breakage, vandalism, litter leakage (due to uncovered bins), etc. The provision of suitable collection vehicles (to allow separate storage of recyclable and non-recyclable street waste) should also be considered, as should additional sorting of wastes collected from such streams to maximise recycling, if the business case can be made for the same.

It is noted that on-the-go recycling bin provision, though associated with reduced littering, has rarely been associated with increased recycling rates, since the stream often remains too contaminated with food, liquids and non-recyclable wastes. In addition, issues with service provision have often arisen in areas that are prone to seasonal tourism activity, with overflowing bins and insufficient collections. Recent advances are being made in both these regards through the introduction of "smart bins" such as the big belly bin<sup>63</sup> and Bin.E.<sup>64</sup>

Accordingly, key actions for success in the design of 'on the go' recycling schemes are:

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<sup>63</sup> <https://bigbelly.com/>

<sup>64</sup> <http://www.bine.world/>

- 45) Identify appropriate bin location, preferably in the most convenient positions, both in terms of access for users and for ease of collection, with adequate signage and close to foot traffic;<sup>65</sup>
- 46) Develop appropriate design for public litter and recycling bins in windy areas, such as covered areas, and also to minimize vandalism or entry by animals;
- 47) Engage with packaging beverage producers to improve efficiency and finance the system.
- 48) Introduce different bins appropriate for different waste types such as cigarette bins;
- 49) Consider high density of bins. Especially important for innovative bins, such as the Ballot Bins, as this increases familiarity;
- 50) Develop simultaneous behaviour change campaigns in order to increase the use of public bins;
- 51) Ensure regular and frequent collection times;
- 52) Ensure regular reporting and monitoring to ensure effectiveness of the service.

The provision of such enhanced waste management services are associated with additional costs to municipalities, though these could be offset by funding from a range of sources, including pay as you throw schemes, and EPR provision for waste collections (both of which are explored above). Engagement with the packaging beverage companies would be recommended to potentially finance the scheme.

## 6.2.7 Maximise Sorting of Plastics from Residual Waste prior to Landfill/ Recovery

While other proposed measures to improve the packaging EPR scheme and associated household waste separate collection system are likely to be the most significant in boosting recycling rates in Greece, 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 in Greece with respect to the average of EU member states and the landfill target of 10% or less, priority should be given to ensuring maximum recycling rates in the existing and planned waste treatment (e.g. MBTs) /recycling infrastructure in the country with the aim of reducing residues (and plastics) to landfill. In particular, in line with the Circular Economy context, options higher in the waste hierarchy such as recycling of plastics versus recovery/disposal should be prioritized.

Thus, considering most suitable treatment processes, for example, maximizing 'sorting' in waste treatment facilities through advanced sorting technologies (e.g. infrared, x-ray, machine learning etc.) would consequently result in lower plastic content of the outputs/ residues. However, it is important to consider the quality and market price of recycled

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<sup>65</sup> Aras, F.K., and Anarat, C. (2016) Relative Location of Bins and Its Effects on Recycling in Campus, *International Journal of Waste Resources*, Vol.6, No.2

plastics as well as of the available outlets in the country for the recyclates produced, otherwise there is a risk that recycled plastics of low quality/ price may be stockpiled and/or subsequently disposed of.

In summary, the following actions are recommended:

- 53) Give priority to ensure maximum recycling rates in the existing and planned waste treatment/recycling infrastructure in the country with the aim of reducing residues (and plastics) to landfill;
- 54) Identify and prioritise options higher in the waste hierarchy such as recycling of plastics versus recovery/disposal;
- 55) Identify funding options to upgrade existing waste treatment facilities such as, EU level: European Regional Development Fund (ERDF), European Fund for Strategic Investment, the Facility for Euro-Mediterranean Investment and Partnership (FEMIP) Trust Fund, or the FTF and at national level: Greek Operational Program 'Competitiveness, Entrepreneurship & Innovation' (EPAnEK), which has a € 4.72 billion public expenditure budget and states that its strategy is to 'enhance the competitiveness and extroversion of enterprises, to facilitate transition to quality entrepreneurship with innovation and the growth of domestic added value'.

## 6.3 Measures to Improve Circularity in Production

### 6.3.1 Implement other financial incentives for producers

The proposed improvements to the packaging EPR scheme highlighted above, focussed on increased fees and the modulation of fees in particular, provides a clear incentive for producers to internalise the end of life costs associated with the packaging they place on the market. This should provide an incentive for producers design packaging that is recyclable, and potentially include more recycled content and reusable design, to some extent (where possible). An additional significant financial incentive could be provided to encourage the uptake of recycled content in particular, such as the introduction of a tax on virgin plastic (to allow recycled plastics to become more price competitive), or the introduction of a tax on packaging that is not recyclable in current systems by 2030. A tax could also be levied on packaging that contains less than a determined threshold amount of recycled plastic, though this requires the establishment of a system to track, calculate and verify the amount of recycled content in packaging, which is currently lacking.

In the short term, further measures to encourage innovation in the development of circular plastics could also be provided in the form of innovation grants to small businesses, and tax rebates to companies that incorporate recyclability and recycled content into their designs. Over time, the necessity for such measures to stimulate the market should reduce.

In summary, the following actions are recommended:

- 56) Introduce eco modulation fees, as it provides a clear incentive for producers to internalise the end of life costs associated with the packaging they place on the

market. This should provide an incentive for producers to design packaging that is recyclable, and potentially include more recycled content/ reusable design.

- 57) Encourage the uptake of recycled content in particular, such as the introduction of a tax on virgin plastic (to allow recycled plastics to become more price competitive), or the introduction of a tax on packaging that is not recyclable in current systems.
- 58) Consider a tax that could be levied on packaging that contains less than a determined threshold amount of recycled plastic, though this requires the establishment of a system to track, calculate and verify the amount of recycled content in packaging, which is currently lacking.
- 59) In the short term, further measures to encourage innovation in the development of circular plastics could also be provided in the form of innovation grants to small businesses, and tax rebates to companies that incorporate recyclability and recycled content into their designs.

### **6.3.2 Implement Packaging Labelling Standard to reflect National Waste Management Conditions**

This measure proposes a revision of packaging labelling standards, recognising issues associated with consumer confusion regarding recyclability and the correct disposal route (not just in Greece, but across the EU). Plastic packaging poses a particular problem in this regard, with only particular polymers and formats being recyclable. In addition, bio-plastic packaging labelled as compostable/ biodegradable is increasingly a problem, with consumers often wrongly assuming such materials will degrade in natural conditions, and therefore littering, while others dispose of these with food waste/ plastic waste, causing issues for waste managers due to contamination.

While wider EU policy to address these issues is forthcoming, specific actions in Greece can be taken to ensure any new requirements are implemented with the maximum impact. Key amongst these is the need for plastic packaging labelling to reflect national waste management conditions and clearly convey information to consumers, as well as the types of packaging on the market. Tailored awareness programmes and clear signposting for guidance at the municipality level are also important.

The impact of such measures could be significant in increasing not only the quantity of, but also the quality of plastic recycling, and reducing costs to waste managers.

In summary, the following actions are recommended:

- 60) Ensure plastic packaging labelling to reflect local waste management conditions.
- 61) Seek a dynamic system that can respond to changes in waste management infrastructure, as well as the types of packaging on the market.
- 62) Tailor awareness raising programmes and clear signposting for guidance at the municipality level.
- 63) Convey clear and concise labelling information to consumers.

## 6.4 Horizontal Waste Management Measures

### 6.4.1 Implement Tax Incentives for waste sector in line with Waste Hierarchy

As set out in Section 4.2, the implementation of the Greek landfill tax (starting at EUR 35/tonne, increasing by EUR 5/tonne every year up to a maximum of EUR 60/tonne) was postponed, due to concern that the tax would worsen the constrained financial situation of local authorities – implying that local authorities would have to pay for the landfill tax but would not be able to pass the extra costs through to their citizens. An increase in the cost of official waste disposal might also lead to a rise in illegal dumping of waste, thereby causing failure to achieve both environmental and revenue-raising objectives. Finally, the present lack of integration of collection services under one provider makes the application of a LFT somewhat problematic, since the collector is not necessarily the same as the disposal authority, and therefore not likely to be influenced to increase separate collections by the landfill tax.

Instead, an environmental fee to support circular economy has been introduced, replacing the landfill tax, payable by municipalities and applying to untreated municipal waste disposed of at landfill. However, there are several key differences, notably the lower rate of fee, as well as the decreasing nature of the fee over time, in relation to progress in the implementation of planned waste treatment plants. In addition, the environmental fee (Law 4555/2018) currently applies only to untreated waste sent to landfill, similar to the initially proposed landfill tax (Law 4042/2012), therefore limiting the provision of a much clearer incentive for diversion of waste from landfilling.

The aim of the environmental fee is therefore to promote the implementation of waste-treatment facilities generally (including MBT for mixed waste and plants for separate treatment of biowaste) that does not exist yet in Greece, which are planned according to regional and national WMPs (2016), but have not been developed yet. Thus, the environmental fee is meant to accelerate the implementation of necessary treatment infrastructure in order to achieve higher recycling rates and minimize landfilling.

However, this measure is unlikely to provide sufficient incentive to reduce landfilling and encourage recycling activities over the longer term. It is therefore proposed that the fee be scrapped in favour of the original landfill tax proposed, alongside measures to improve enforcement against waste mismanagement and restructure waste management services (focussed on EPR) to reduce the negative impacts that were originally associated with it.

In summary, the following actions are recommended:

- 64) Introduce landfill tax for all waste as the environmental fee is applied only to untreated MSW, while the landfill tax will be applied to all waste (treated or untreated) landfilled.
- 65) Apply measures to improve enforcement against waste mismanagement and restructure waste management services (focussed on EPR) to reduce the negative impacts that were originally associated with it.

## 6.4.2 Implement and Enforce Accountability Mechanisms for Mismanaged Waste

This measure relates to reducing the mismanagement of waste, including illegal dumping, fly-tipping and littering through rigorous enforcement. Greece's current trend in identifying and addressing illegal landfill sites should be maintained, while enforcement activity against other forms of waste crime are limited.

A key factor towards the success of this intervention is instatement of suitable penalties and fines that are high enough to act as sufficient deterrents; where these do not exist, the impact of the regulation is likely to be very low as there is no incentive to comply. This needs to be accompanied by effective monitoring and enforcement which can in many cases be aided by suitable digital systems, including traceability systems for waste at various stages in the management chain, registration of waste carriers, public reporting systems, consistent data gathering and reporting techniques, etc.

While such enforcement activity can often require significant funding, municipalities and national agencies could recover some of these costs through the funding sources identified in this report – including EPR schemes, pay as you throw systems, and levies on single use plastics.

In summary, the following actions are recommended:

- 66) Introduction of suitable penalties and fines that are high enough to act as sufficient deterrents.
- 67) Effective monitoring and enforcement which can in many cases be aided by suitable digital systems, including traceability systems for waste at various stages in the management chain, registration of waste carriers, public reporting systems, consistent data gathering and reporting techniques, etc.

## 6.4.3 Scale up Pay as you Throw Initiatives

Pay-As-You-Throw (PAYT) is a waste management approach whereby a business or individual is subject to a fee which is linked to a quantitative measure of waste set out for collection. A PAYT system works by creating an economic incentive to reduce waste, and/or creating an economic incentive to recycle waste. Such a charging scheme can also provide cost recovery, improve data collection and efficiency of waste collection.

As set out in Section 5.1.2, a number of pilots under the EU LIFE+ programme have already been carried out to test pay as you throw (PAYT) approaches to increase recycling at the local level in Greece. In addition, the European Commission's 2018 Early Warning Report for Greece suggests PAYT as a key measure for improving Greece's performance against future municipal waste recycling targets.<sup>66</sup>

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<sup>66</sup> Eunomia. (2018): Study to Identify Member States at Risk of Non-Compliance with the 2020 Target of the Waste Framework Directive, available at

The impacts of PAYT are linked largely to the design of the scheme in question, depending on, inter alia, the structure and level of the fee, the use of revenue, and the level of enforcement in place.

These are briefly discussed as the key elements for success of PAYT in Greece, which form the recommended actions:

- 68) Fee structure** - In general, the literature shows that weight-based schemes have the greatest impact on reducing total waste quantities and increasing recycling (total waste reduced by 38%), with payments for sacks also proving to be highly effective (36% reduction in waste when charges were also placed on compostable waste). On the other hand, a number of studies have found that volume-based systems, which use sacks and containers, have the weakest impact (6% reduction in total waste).<sup>67</sup> In Greece's context, a fee levied on the basis of prepaid bags/containers is preferable, as there are significant barriers for local authorities upgrading their waste fleet to include weighing scales, and sack-based schemes can achieve a similar high level of impact with lower upfront costs. The waste bags/containers should be clear in order to check contamination. Home composting bins should be available free of charge, as in the Elefsina pilot.
- 69) Level of fees** - The charge per bag/container for residual waste should be set according to each municipality (bearing in mind variations in separate collection services and frequency, as well as the population density and income levels in different localities). Bags/containers should only be purchased directly from the municipality and should be appropriately identified/labelled. The charge should be set, such that a proportion of the fee covers the cost of the waste collection system, with the other component of the charge significant enough to influence behaviour. The strongest impact of waste prevention may be expected where a charge is placed on all collection streams, including recyclable/ compostable materials.
- 70) Use of Revenue** - The charge should be levied so as to cover the full costs of the service provision. In order to prevent the scheme from becoming regressive, this could include an additional support service, such as discounted prices or provision of free sacks, for low income households and those with young children. It is recommended that any subsequent revenue raised by municipalities is first invested in improving the separate waste collection infrastructure/service, and second used to support other environmental projects.
- 71) Enforcement** – The service costs above should include consideration of the need for enforcement to ensure the success of PAYT programmes. This is because individuals may seek to evade payment through illegal behaviour and illegitimate disposal

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[http://ec.europa.eu/environment/waste/framework/pdf/Early%20Warning%20System\\_Final\\_Report.pdf](http://ec.europa.eu/environment/waste/framework/pdf/Early%20Warning%20System_Final_Report.pdf)

The early warning report for Greece, available at

[http://ec.europa.eu/environment/waste/pdf/early\\_warning\\_report\\_EL.pdf](http://ec.europa.eu/environment/waste/pdf/early_warning_report_EL.pdf)

<sup>67</sup> Dutch studies by Dijkgraaf and Gradus looking at data from the Netherlands Waste Management Council (AOO) for 1998, 1999 and 2000

routes such as burning, flushing and fly-tipping of waste, or fraudulent activity such as incorrectly disposing of waste at civic amenity sites, using illegitimate sacks, disposing waste in another household or commercial property's bins, or to another municipality which does not implement a PAYT. In the case of multi-storey buildings, enclosed large containers should be provided with access only for the participating households. Charging for Civic Amenity sites, or a change in the nature/cost of bulky waste provision could also prevent against fraudulent activity (see Section 6.2.5).

#### **6.4.4 Implement National Packaging Register to Improve Supply Chain Validation/ Monitoring**

The issue of inadequate data availability and accuracy, particularly for packaging waste, is one that is widely recognised. At the EU level, a new methodology for the calculation of packaging waste recycling has been outlined in order to address some of the problems associated with the existing data on packaging placed on the market, and packaging recycled at present. This improved method is likely to make meeting the new recycling targets more challenging. Additionally, the development of policies related to packaging (including plastics) at the national level relies heavily on the quality and availability of data, which can be improved significantly.

This measure, therefore, proposes the development of a national packaging registry focussed on gathering the evidence required to monitor and enforce compliance with packaging regulations and targets related to recycling, reuse and recycled content use. Such a registry should be harmonised with the information currently gathered by EPR schemes to prevent duplication of effort (packaging quantities, weight, material composition. Producers could additionally be required to provide information (potentially through self-certification in order to reduce administrative burden) on the specific types and formats of packaging being placed on the market, their chemical composition/ use of hazardous content, the use of recycled content, the current rate of recycling for each, and reusability.

In order to maximise the impact that could be associated with this measure, particularly in the case of self-certification of compliance against these criteria, producers should be required to supply all the necessary evidence of compliance to enable third-party auditing in order to validate the information (which could be either intentional or unintentional). Auditing should be undertaken rigorously and against set targets (e.g. each company at least once every 5 years) and minimum penalties for non-compliance should be outlined and enforced strictly. It is also noted that at present, there is no consistent nomenclature for various types and formats of packaging, so one would have to be developed to enable producers to report data consistently and in a comparable manner. Finally, non commercially-sensitive information on packaging could be made publicly available, not only to enhance producer accountability, but also to spread awareness among consumers regarding the types of packaging they use. This would also encourage scrutiny of the market and policies by academic, community and not-for-profit institutions, enhancing transparency in the legislative process. The costs

associated with the maintenance of such a registry at the national level could be offset by an annual registration fee charged to producers at the time of registration.

In summary, the following actions are recommended:

- 72) The National Electronic Registry for Producers (EMΠA)<sup>68</sup> should be harmonised with the information currently gathered by EPR schemes to prevent duplication of effort (packaging quantities, weight, material composition);
- 73) Producers could additionally be required to provide information (potentially through self-certification in order to reduce administrative burden) on the specific categories, types and formats of packaging being placed on the market, their chemical composition/ use of hazardous content, the use of recycled content, the current rate of recycling for each, and reusability;
- 74) Producers should be required to supply all the necessary evidence of compliance to enable third-party auditing in order to validate the information;
- 75) Auditing should be undertaken rigorously and against set targets (e.g. each company at least once every 2 years) and minimum penalties for non-compliance should be outlined and enforced strictly;
- 76) Non commercially-sensitive information on packaging could be made publicly available, not only to enhance producer accountability, but also to spread awareness among consumers regarding the types of packaging they use.
- 77) The costs associated with the maintenance of such a registry at the national level could be offset by an annual registration fee charged to producers at the time of registration.
- 78) Consider the National Electronic Registry for Producers (EMΠA) to be linked to the national tax authorities and national registry authorities to ensure validation of producers establishment.

## 7.0 Scorecard

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Following the description and outline of key policy measures and actions that should be prioritised in Greece a scorecard has been developed to measure achievement or progress towards reduction of plastic pollution in the short/medium and long term.

Table 4 below provides some guidance for the better use and completion of the scorecard which is subsequently presented in Table 5.

- **The importance/potential impact** has been described under Section 6.0 and ranges from low / medium /high.

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<sup>68</sup> <https://www.eoan.gr/el/content/17/mitroo>

- **All listed measures have** been shortlisted from a wider list of measures ensuring these cover the full value-chain of plastic pollution management;
- **The level of policy in place** has been defined based on whether there is or not any policy in place, or it has been planned.
- **The level of implementation** has been defined based on 4 different stages of implementation ranging from none all the way to good implementation / enforcement.
- **The Current policy performance in Greece** is calculated based on both the level of policy in place x the level of implementation providing a scoring of poor (1-4), average (5-9) and good (10-12).
- **The key elements for successful introduction or implementation** have been drawn from Section 6.0, presenting a clear list of actions that should be considered and assessed further to ensure reduction of plastic pollution in Greece.

**Table 4: Scorecard Guidance**

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance		Key elements for successful introduction or implementation
				Score	Performance	
High		1. No 2. No, but planned 3. Yes	1. None, needs immediate introduction 2. Policy adopted but not implemented, needs further revision/ implementation 3. Policy implemented but improvements/revision needed 4. Good implementation/ enforcement	1-4	Poor	
Medium				5- 9	Average	
Low				10- 12	Good	

**Table 5: Scorecard**

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
High	Implement SUP Bans with Levies on SU Alternatives as per Directive (EU) 2019/904	2	1	2	<ul style="list-style-type: none"> <li>• Ensuring that the relevant bans are fully implemented and strictly enforced across the whole plastics value chain in a phased transparent manner (manufacture, production, distribution, sale, possession and import of the relevant items).</li> <li>• Ensuring that incentives are in place to ensure that demand for the relevant SUP items is not simply shifted to other potentially damaging single use products and that multi-use alternatives are prioritised.</li> <li>• Consulting the waste management sector regarding the alternatives being incentivised.</li> <li>• Putting in place a clear, transparent system for data collection and monitoring regarding the effectiveness of specific measures.</li> </ul>
High	Reduce SUP Consumption through Green Public Procurement (GPP)	2	1	2	<ul style="list-style-type: none"> <li>• Improve circularity in plastic consumption not only in the procurement of products (packaging, furniture, office supply and IT), but also services (such as cleaning services, waste management services, etc.). This should include indication of clear preference for materials that are reusable (e.g. glasses in place of disposable cups), readily recyclable in local waste management operations, and which include recycled content.</li> <li>• Clear methods for verification of such criteria should be developed, as well as monitoring of the impacts (a high collection and recycling target for publicly procured plastics).</li> <li>• Increased short-term costs, though in the long term, the business case for change and subsequent procurement decisions should consider environmental and social impacts as well as financial costs.</li> <li>• Providing public authorities with opportunities for engagement with and understanding of the issues associated with plastics.</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
High	Improve Existing EPR Scheme for Packaging	3	3	9	<p>Current proposals for reform should include:</p> <ul style="list-style-type: none"> <li>• Increase in and modulation of fees to achieve at least 80% cost coverage</li> <li>• Expansion of scheme to cover all producers to prevent free riding</li> <li>• Reconfiguration of operational/ financial roles</li> <li>• Assign clear responsibilities to improve efficiency</li> <li>• 100% geographical coverage of the packaging waste system to increase accessibility (Blue Bin)</li> <li>• Improve/Upgrade equipment for all municipalities (where containers are lost or damaged)</li> <li>• Update/Improve awareness raising</li> </ul>
High	Implement DRS for Beverage Containers	2	1	2	<p>The success of a system depends on:</p> <ul style="list-style-type: none"> <li>• The design chosen and mechanisms for supporting targets.</li> <li>• The return rate will primarily depend on the value of the deposit to the consumer.</li> <li>• The ease of returning the used beverage containers for a deposit refund.</li> <li>• If the beverage industry is running the DRS as a form of producer responsibility, with a minimal role for the Government.</li> <li>• The Government legislating to require a deposit to be charged on certain beverage containers and sets a minimum recycling target.</li> <li>• The industry must be given time to agree on the selected design, to put in place the necessary systems, infrastructure and people, and to change the container labels to incorporate the deposit logo.</li> <li>• Level of communicating the benefits to producers, particularly in terms of the positive reputational image and increased supply of material for new containers.</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
High	Scale up pay-as-you-throw initiatives	1	1	1	<p>A PAYT can provide cost recovery, improve data collection and efficiency of waste collection and reduce waste to landfill. Potential steps could include:</p> <ul style="list-style-type: none"> <li>• Fee structure;</li> <li>• Level of fees;</li> <li>• Use of revenue;</li> <li>• Enforcement;</li> <li>• Exchange of good practices with other EU MS having success PAYT schemes.</li> </ul>
High	Implement Tax Incentives for waste sector in line with the waste hierarchy	3	2	6	<ul style="list-style-type: none"> <li>• Introduce landfill tax for all waste as the environmental fee is applied only to untreated MSW, while the landfill tax will be applied to all waste (treated or untreated) landfilled.</li> <li>• Apply measures to improve enforcement against waste mismanagement and restructure waste management services (focussed on EPR) to reduce the negative impacts that were originally associated with it.</li> </ul>
High	Implement and Enforce Accountability Mechanisms for Mis-managed Waste	3	3	9	<ul style="list-style-type: none"> <li>• Introduction of suitable penalties and fines that are high enough to act as sufficient deterrents.</li> <li>• Effective monitoring and enforcement which can in many cases be aided by suitable digital systems, including traceability systems for waste at various stages in the management chain, registration of waste carriers, public reporting systems, consistent data gathering and reporting techniques, etc.</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
High	Implement National Packaging Register to Improve Supply Chain Validation/ Monitoring	3	3	9	<ul style="list-style-type: none"> <li>• The National Electronic Registry for Producers (ΕΜΠΑ) should be harmonised with the information currently gathered by EPR schemes to prevent duplication of effort (packaging quantities, weight, material composition);</li> <li>• Producers could additionally be required to provide information (potentially through self-certification in order to reduce administrative burden) on the specific categories, types and formats of packaging being placed on the market, their chemical composition/ use of hazardous content, the use of recycled content, the current rate of recycling for each, and reusability;</li> <li>• Producers should be required to supply all the necessary evidence of compliance to enable third-party auditing in order to validate the information;</li> <li>• Auditing should be undertaken rigorously and against set targets (e.g. each company at least once every 2 years) and minimum penalties for non-compliance should be outlined and enforced strictly;</li> <li>• Non commercially-sensitive information on packaging could be made publicly available, not only to enhance producer accountability, but also to spread awareness among consumers regarding the types of packaging they use.</li> <li>• The costs associated with the maintenance of such a registry at the national level could be offset by an annual registration fee charged to producers at the time of registration.</li> <li>• Consider the National Electronic Registry for Producers (ΕΜΠΑ) to be linked to the national tax authorities and national registry authorities to ensure validation of producers establishment.</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
Medium	Implement Nationwide Potable Water/ Refill Systems	3	2	6	<ul style="list-style-type: none"> <li>• Improve network of refillable stations.</li> <li>• Incorporate on municipalities Local Action Plans, aiming to reduce plastic waste and litter.</li> <li>• Increase awareness raising.</li> <li>• Ensure installations of refill systems on islands &amp; remote areas</li> <li>• Introduce information campaigns that highlight the quality of the water to ensure the greatest uptake.</li> <li>• Refill programmes are likely to be successful when networks are widespread and reliable, and where effective signposting of refill locations exists, through the use of apps or window signs for instance.</li> </ul>
Medium	Implement Packaging Labelling Standard to Reflect Local Waste Management Conditions	3	3	9	<ul style="list-style-type: none"> <li>• Need for plastic packaging labelling to reflect local waste management conditions.</li> <li>• Seek a dynamic system that can respond to changes in waste management infrastructure, as well as the types of packaging on the market.</li> <li>• Heightened awareness programmes and clear signposting for guidance at the municipality level.</li> <li>• Clearly convey information to consumers.</li> </ul>
Medium	Implement EPR Scheme for Agricultural Plastics	2	1	2	<ul style="list-style-type: none"> <li>• Introduction of EPR scheme for agricultural films and pesticide packaging.</li> <li>• Closely monitoring /verification by EOAN (via Electronic Registry).</li> <li>• Ensure EPR scheme is designed to provide 100% geographical coverage - include waste producers in remote locations/ islands that currently have no access to separate collection points.</li> <li>• All producers should be included, and smaller retailers could additionally be engaged to provide collection points/ take-back schemes.</li> <li>• Consider for inclusion upfront to ensure that the collection scheme deigned is efficient from the outset (e.g. twines, nets, piping, drums, etc.).</li> <li>• Exchange of good practices with EU MS that have successfully implemented similar EPR schemes</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
Medium	Implement EPR for Fishing Gear (nets)	2	1	2	<ul style="list-style-type: none"> <li>• Introduce EPR scheme for fishing gear following an assessment of the design, key stakeholders involved, implementation, related costs, collection/recycling/recovery of the fishing gear.</li> <li>• Close monitor by EOAN (Electronic Registry).</li> <li>• Engagement with current voluntary programmes that are collecting and processing such waste will be important in identifying end markets and identifying the streams that could be collected in the short terms (nets, but could also include buoys, traps, etc.).</li> <li>• Fee structure for any such EPR scheme should be innovative, focussed on incentivising improved fishing gear design and gear retrieval options, alongside a DRS approach to ensure collection efficiency.</li> <li>• The informal fishing sector in Greece, as well as the geographical distribution of the sector will be important considerations in ensuring uptake of the scheme.</li> </ul>
Medium	Improve non-packaging plastic waste collection systems	3	2	6	<ul style="list-style-type: none"> <li>• Actions to improve the collection and recycling of non-household plastic streams, including separate collection and storage of shipping/ fishing waste plastics and bulky waste (such as furniture, toys, etc.).</li> <li>• Alignment with the measures set out in the Commission's revised PRF Directive: ensure that this waste is not discharged at sea, but landed in ports to adequate waste reception facilities.</li> <li>• Separate collection of bulky waste in the planned 'green points' or other appropriate facilities aiming at maximizing sorting, reuse and recycling of materials including plastics</li> <li>• Development of guidelines for municipalities to manage seasonal increases in municipal waste generation associated with tourism, including, for example, guidelines on implementing the waste hierarchy and case studies of best practice for tourist accommodation, events and spaces.</li> <li>• Improve Green Procurement for C&amp;D plastic waste - introduce strict specification criteria.</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
Medium	Financial Incentives for Producers Incentivising recycled content uptake/ innovation in plastic alternatives	1	2	2	<ul style="list-style-type: none"> <li>• Fees in particular, provides a clear incentive for producers to internalise the end of life costs associated with the packaging they place on the market. This should provide an incentive for producers design packaging that is recyclable, and potentially include more recycled content/ reusable design.</li> <li>• Encourage the uptake of recycled content in particular, such as the introduction of a tax on virgin plastic (to allow recycled plastics to become more price competitive).</li> <li>• A tax could also be levied on packaging that contains less than a determined threshold amount of recycled plastic, though this requires the establishment of a system to track, calculate and verify the amount of recycled content in packaging, which is currently lacking.</li> <li>• In the short term, further measures to encourage innovation in the development of circular plastics could also be provided in the form of innovation grants to small businesses, and tax rebates to companies that incorporate recyclability and recycled content into their designs.</li> </ul>
Low	Develop and Implement on-the-go waste collection for recycling	3	3	9	<ul style="list-style-type: none"> <li>• Identify appropriate bin location, preferably in the most convenient positions, both in terms of access for users and for ease of collection, with adequate signage and close to foot traffic;</li> <li>• Develop appropriate design for public litter and recycling bins in windy areas, such as covered areas, and also to minimize vandalism or entry by animals;</li> <li>• Engage with packaging beverage producers to improve efficiency and finance the system.</li> <li>• Introduce different bins appropriate for different waste types such as cigarette bins;</li> <li>• Consider high density of bins. Especially important for innovative bins, such as the Ballot Bins, as this increases familiarity;</li> <li>• Develop simultaneous behaviour change campaigns in order to increase the use of public bins;</li> <li>• Ensure regular collection times;</li> <li>• Ensure regular reporting and monitoring to ensure effectiveness of the service</li> </ul>

Importance / Potential Impact	Measure	Policy in place	Level of implementation	Greece current policy performance	Key elements/actions for successful introduction or implementation
Low	Implement Microplastic Prevention/Reduction Measures	1	1	1	<ul style="list-style-type: none"> <li>• Need for detailed studies and stakeholder engagement to understand the issue of microplastic pollution in Greece, including consideration of the stocks and flows of both intentionally added sources of microplastics.</li> <li>• Short/ medium term policy actions could therefore include limiting microplastic pollution associated with microplastics intentionally added to products, such as a supply chain approach to pre-production plastic pellet handling regulations and a ban on microbeads in hygiene products.</li> </ul>
Low	Maximise Sorting of Plastics from Residual Waste	2	2	4	<ul style="list-style-type: none"> <li>• Give priority to ensure maximum recycling rates in the existing and planned waste treatment/recycling infrastructure in the country with the aim of reducing residues (and plastics) to landfill;</li> <li>• Identify and prioritise options higher in the waste hierarchy such as recycling of plastics versus recovery/disposal;</li> <li>• Identify funding options to upgrade existing waste treatment facilities such as, EU level: European Regional Development Fund (ERDF), European Fund for Strategic Investment, the Facility for Euro-Mediterranean Investment and Partnership (FEMIP) Trust Fund, or the FTF and at national level: Greek Operational Program 'Competitiveness, Entrepreneurship &amp; Innovation' (EPAnEK).</li> </ul>

# APPENDICES

## **A.1.0 Single-use plastic products covered by Article 4 on consumption reduction**

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European Commission (2019) Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment

Annex

Part A

- (1) Cups for beverages, including their covers and lids;
- (2) Food containers, i.e. receptacles such as boxes, with or without a cover, used to contain food which:
  - (a) is intended for immediate consumption, either on-the-spot or take-away,
  - (b) is typically consumed from the receptacle, and
  - (c) is ready to be consumed without any further preparation, such as cooking, boiling or heating, including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food.

## **A.2.0 Single-use plastic products covered by Article 5 on restrictions on placing on the market**

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European Commission (2019) Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment

Annex

Part B

- (1) Cotton bud sticks, except if they fall within the scope of Council Directive 90/385/EEC (1) or Council Directive 93/42/EEC (2);
- (2) Cutlery (forks, knives, spoons, chopsticks);
- (3) Plates;
- (4) Straws, except if they fall within the scope of Directive 90/385/EEC or Directive 93/42/EEC;

(5) Beverage stirrers;

(6) Sticks to be attached to and to support balloons, except balloons for industrial or other professional uses and

applications that are not distributed to consumers, including the mechanisms of such sticks;

(7) Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to

contain food which:

(a) is intended for immediate consumption, either on-the-spot or take-away,

(b) is typically consumed from the receptacle, and

(c) is ready to be consumed without any further preparation, such as cooking, boiling or heating,

including food containers used for fast food or other meal ready for immediate consumption, except beverage

containers, plates and packets and wrappers containing food;

(8) Beverage containers made of expanded polystyrene, including their caps and lids;

(9) Cups for beverages made of expanded polystyrene, including their covers and lids.