

Measures to Prevent Marine Plastic Pollution

The Trouble with
Targets and the
Merits of Measures

About Eunomia

Eunomia is one of the leading research organisations focusing on the sources and impacts of waste in the marine environment. We have undertaken a range of studies in this area, investigating the sources, pathways and impacts of marine litter, and exploring the effectiveness of preventative and removal measures.

Clients in this field include the UN, European Commission and the Clean Europe Network. Our work has given us a detailed knowledge of the relative strengths of different monitoring approaches, a solid understanding of the extant literature (and areas where research is lacking), and excellent contacts with academics and practitioners across the globe.

Eunomia Research & Consulting Ltd
37 Queen Square
Bristol
BS1 4QS
United Kingdom

Tel: +44 (0)117 917 2250
Fax: +44 (0)871 714 2942
Web: www.eunomia.co.uk
E-mail: mail@eunomia.co.uk

Disclaimer

Eunomia Research & Consulting has taken due care in the preparation of this report to ensure that all facts and analysis presented are as accurate as possible within the scope of the project. However no guarantee is provided in respect of the information presented, and Eunomia Research & Consulting is not responsible for decisions or actions taken on the basis of the content of this report.

Contents

- 1.0 Introduction 1**
- 2.0 Background 1**
- 3.0 The Trouble with Targets 2**
 - 3.1 Current Targets 2
 - 3.1.1 *Marine Strategy Framework Directive* 2
 - 3.1.2 *The Circular Economy Package* 3
 - 3.1.3 *UN Sustainable Development Goals*..... 3
 - 3.1.4 *Recent Calls for New Targets* 3
 - 3.2 The Challenge of Monitoring 4
 - 3.2.1 *The Scale of the Monitoring Challenge* 4
 - 3.3 Conclusions 4
- 4.0 The Merit of Measures 4**
 - 4.1 Are Drastic Measures Called For? 5
 - 4.2 Can a More Measured Response Be Effective? 5
 - 4.3 Acting in Union While Maintaining Subsidiarity 7
 - 4.4 Conclusions 7

1.0 Introduction

Marine plastics are an emerging issue that policy makers are beginning to grapple with. However, the information we currently have on the extent – and ultimately the cost – of their impacts is limited. This makes it challenging to identify what a '[socially optimal](#)' level of marine plastic pollution would be.

While we may not yet know enough to understand the full scale of the problem, it seems unlikely that future research will lead to reduced cause for concern. However, the lack of information at present seems to be encouraging a wide spectrum of policy responses, ranging from a complete ban on many kinds of plastic at one extreme, to “do nothing until we’ve improved our data” at the other.

In this document we reflect upon the data challenge and explain why detailed monitoring of marine litter is difficult, expensive and ultimately, perhaps, unnecessary. We argue that setting reduction targets for marine plastics is unlikely to be effective policy. Instead, we propose a “Best Available Technique” approach to the selection of measures that could be adopted by the European Commission, similar to the way in which industrial emissions are addressed.

Adopting this approach will allow effort and resources to be focused on measures that are very likely to reduce the problem instead of being diverted into simply assessing how much worse it is getting.

2.0 Background

It seems that every month new academic publications suggest further ways in which plastics are damaging the marine environment, and compounding issues such as ocean acidification and over-fishing.

Many of the more obvious impacts of larger plastic items – whales being entangled in fishing nets, turtles ingesting plastic bags – are known, even if their scale isn't yet fully understood. Other possible impacts with far wider implications, such as the ingestion by marine fauna of plastic items on which persistent organic pollutants (POPs) have become concentrated, are emerging.

There has been considerable discussion of how to prevent *primary* microplastics, such as those found in cosmetic products, entering the marine environment; rather less about *secondary* microplastics, which result from the fragmentation of larger plastic items already in the marine environment. Concerns relating to microplastics include:

- their reported effects on shellfish reproduction and growth, and what this might mean for the ecosystem services they provide, including nutrient and sediment removal from the water column, and storm surge protection for coastal areas;

- their impacts on coral nutrient uptake, and the ramifications of this for tourism, marine life and fisheries that depend upon these habitats; and
- the ingestion of microplastics by zooplankton, which harms their energy uptake, and may therefore affect commercial fisheries and the wider marine food web.

An estimated 12 million tonnes of plastic per annum continues to flow into the oceans. In the absence of substantive action, this amount is forecast to increase, adding to the existing stock of debris that litters our beaches, and reaches all corners of the ocean – at the surface, in the water column, and on its floor.

3.0 The Trouble with Targets

One of the principal tools that legislators use to drive change is to set targets. A significant advantage of using targets is that they specify the outcome to be achieved, but leave individual actors free to decide how best to achieve them. This is important for European legislation, where the principle of subsidiarity must be respected, and can unleash creative solutions that are tailored to specific circumstances.

3.1 Current Targets

At present, there are no binding, quantitative targets for European countries to reduce marine litter, although a number of pieces of legislation and international agreements have a bearing on the issue.

3.1.1 Marine Strategy Framework Directive

Under the [Marine Strategy Framework Directive](#) (Directive 2008/56/EC) (MSFD), Descriptor 10 of ‘good environmental status’ (GES) concerns marine litter. It states:

“Properties and quantities of marine litter do not cause harm to the coastal and marine environment”.

GES must be achieved by 2020. [A commission decision](#) set out criteria for measuring the descriptor, based on four types of marine litter indicator:

- 1) beach litter;
- 2) floating/water column litter;
- 3) micro-plastics; and
- 4) the impacts of litter on marine life.

Member States are required to assess trends in amount, composition, spatial distribution and (where possible) source of marine litter, set the targets necessary for achieving good environmental status, and monitor progress towards these goals.

However, when, in 2014, the Joint Research Centre (JRC) reviewed what Member States had submitted, it was [found](#) that only 15 states had actually set targets and indicators, and many did not address all four GES criteria. Moreover, the targets set were found not to allow comparisons between countries.

Table 1: Number of Member States Setting Marine Litter Targets

Criterion	Number of Member States
Coastline	15
Water Column	8
Microplastics	6
Impacts on Marine Life	12

75% of Member States included a definition of what good environmental status means in terms of “causing no harm”; only 25% provided definitions for good environmental status based on the four criteria and only 15% for specific indicators. Only 10% defined a baseline for determining good environmental status and none had included thresholds in their definition.

[Only 8](#) states have [submitted](#) their Programmes of Measures to the Commission as required by the MSFD. Even where states are in formal compliance with MSFD requirements, it does not necessarily mean they are taking action. The UK’s programme, for example, [relies wholly](#) on initiatives that were already in train, and which (by their [own assessment](#)) are not likely to achieve the marine litter goals.

3.1.2 The Circular Economy Package

The European Commission’s [circular economy action plan](#) retains [an aspirational target](#) from the previous draft, namely:

“reducing marine litter by 30% by 2020 for the ten most common types of litter found on beaches, as well as for fishing gear found at sea, with the list adapted to each of the four marine regions in the EU.”

While this may sound significant, for the land based sources it broadly represents the expected benefits from the improvement in waste management due to the 2008 revised Waste Framework Directive, rather than an additional goal.

3.1.3 UN Sustainable Development Goals

The [2030 UN Sustainable Development goals](#) include an unquantified target to:

“by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.”

3.1.4 Recent Calls for New Targets

There have been various calls for 50% reduction targets, notably from the European Parliament ([50% reduction by 2025 on 2015 levels](#)) and from [NGOs](#). This was reiterated in Amendment 13a of the European Parliament’s [comments on the proposed Waste Framework Directive revisions](#). It is unclear whether these calls will be taken forward.

3.2 The Challenge of Monitoring

If targets are to be effective as a means to stimulate action, we need reliable monitoring. In the case of litter, and marine litter in particular, this is easier said than done.

Questions that are easy to ask are hard to answer, such as:

- Where does litter come from?
- How much is there?
- Where does it end up?
- How much harm does it cause?
- What is the cost of the harm it causes?

The problem is, monitoring litter is technically difficult, and therefore expensive.

It is thus unsurprising that, as of 2013, [only 10 Member States out of 20](#) had data in even *some* of the MSFD categories (e.g. coastline, water column). The many data gaps (both temporal and geographic) were primarily due to a lack of *data* and of *methodological knowledge*. Although fruitful effort has been [invested in devising frameworks](#) for [good quantitative monitoring](#), these methods are not yet sufficiently widely used to allow monitoring of EU-wide marine litter targets.

3.2.1 The Scale of the Monitoring Challenge

The biggest problem with getting good data is the massively varying abundance of litter depending on when and where you measure. Litter moves between beaches, the water column, and the sea bed depending on the season and the weather.

In order to identify trends in such ‘noisy’ data, a significant number of data points, spread out in time and location, are required. Statistical analysis [suggests](#) that, in order to detect a 50% increase in microplastic litter floating in the Northeast Pacific with 80% probability would require 250 samples. Monitoring on this scale simply isn’t taking place, and would be enormously expensive to do widely.

It is easier and cheaper to monitor litter levels on land; and with, globally, [around 80% of marine litter coming from land](#), and if targets are to be set, it may be the best place to set them.

3.3 Conclusions

Although some target-based policies are being implemented in Europe, they appear to have limited potential. We need to be realistic about what monitoring effort is achievable and what purpose it can usefully serve. Robust marine litter monitoring is difficult and expensive, which poses challenges for target-based measures.

4.0 The Merit of Measures

Targets clearly have their limitations. Especially where baseline information on the social, environmental and economic consequences is in short supply, the level at which a

target is set can be somewhat arbitrary. The difficulty of monitoring marine litter also makes establishing compliance with a target problematic.

This is not to say targets have no role. The European Parliament's call for a target to reduce land-based litter by 50% by 2030, exemplified by their [proposed amendments to the Waste Framework Directive revisions](#), could lead to significant reductions in marine litter, while being easier to monitor. Importantly, individual Member States would also have greater control over the achievement of such a target, because the marine litter found in an individual Member State's waters can come from many nations.

However, targets often function simply as a driver for the implementation of effective measures. The European Commission has already acknowledged the importance of requiring Member States to adopt specific measures to tackle litter. This can be seen in the proposed Circular Economy Package revisions to the Waste Framework Directive; and – with a greater focus on marine litter prevention – in the responses to it by the [European Parliament Committee on the Environment, Public Health and Food Safety](#) and individual MEPs. However, there is little clarity as yet regarding what measures might be needed or how the legislation might best be framed.

4.1 Are Drastic Measures Called For?

Despite our expanding awareness of the problems caused by marine plastics, the flow of material into the ocean continues. If we want to truly cut the problem off at source, there is an argument for applying the precautionary principle: we know the impacts are negative, and expect to discover additional damage and few (if any) benefits, as our knowledge develops, so we should do all we can to address the problem.

There are, indeed, [calls](#) for us to [abandon plastics](#) altogether. However, the campaigners who attempt to live without plastics describe the almost insurmountable [obstacles this poses](#) to carrying out normal daily tasks. Moreover, not all plastics (or types of plastic item) are equally likely to end up in the marine environment.

Plastics are ubiquitous for good reason. They bring considerable benefits in many applications, including helping keep food fresh and enabling products to be delivered safely. On balance, turning our backs on *all* plastic is unlikely to be beneficial.

4.2 Can a More Measured Response Be Effective?

If targets are not the whole answer, and a wholesale move away from plastics would be to throw the baby out with the bathwater, an alternative approach is needed. The best balance of costs and benefits is likely to be delivered by a proportionate response, based firmly on circular economy principles such as:

- preventing waste;
- incentivising the use of durable products; and
- ensuring materials are returned for high quality recycling.

With the right measures in place, plastics could become the poster child rather than the black sheep of the [circular economy](#).

Eunomia advocates implementing a series of ‘best in class’ measures addressing specific items that are clearly identifiable as contributors to marine litter. This approach is akin to the concept of Best Available Technique (BAT), used in the Industrial Emissions Directive (IED). It would mean each nation doing all that it reasonably can to prevent the key sources of marine plastics – and would not create a huge burden of monitoring, which could fall disproportionately on maritime Member States.

Of course, we still need to know which measures are effective, but establishing this on a case by case basis is far easier than trying to make an overall assessment. In many cases, there will also be other good reasons to implement measures, for example because they may help reduce levels of litter in our streets and parks, even where the benefits to the marine environment are not fully quantifiable.

A list of measures could be developed by an expert committee, much as happens with the IED’s BAT Reference documents (BREFs) and associated BAT conclusions. Measures the committee might consider could include:

- A deposit-return scheme for single-use beverage containers, especially plastic bottles, to both bring about high levels of recycling and reduce littering.
- A levy on disposable items that contain plastic, such as single-use takeaway cups and cutlery, to incentivise reusables and reduce waste and the potential for littering.
- The phasing out of plastic cotton bud sticks, which can readily be replaced with paper-based alternatives.
- A levy on cigarettes to fund the cost of clean-up and incentivise a reduction in littering
- Addressing plastic pellet loss by establishing the prevention techniques recommended in [Operation Clean Sweep guidance](#) as BAT for plastics producers and converters.
- A comprehensive ban on microbeads in cosmetics products, which might subsequently be extended to other products that are sources of marine microplastics.
- The phasing out of plastic drinking straws and stirrers
- Using extended producer responsibility to require those placing plastics packaging on the market to bear the full economic cost of collecting and treating them, including the costs of litter collection. This approach is foreseen in the European Commission’s proposals for the revised Waste Framework Directive.
- Implementation of producer responsibility for fishing nets to incentivise both design for end-of-life management and high levels of recovery at end-of-life.

This list of measures could be expanded or adapted as new techniques are developed, or in response to newly identified sources of marine plastics. For example, artificial sports pitches and vehicle tyre dust are potential sources of marine microplastics that have received far less attention to date than have cosmetics. As more is learnt about these sources, best in class preventative measures can be identified.

4.3 Acting in Union While Maintaining Subsidiarity

It is important that all Member States implement these BAT-like measures if we are to be successful in tackling marine plastics. The problem cannot be effectively addressed one Member State at a time, or solely by maritime nations. Plastic litter does not respect national boundaries, travelling down rivers and swept by currents from one country's coastline to another. If some Member States implement best in class measures while others don't, the overall effectiveness will be reduced.

However, this presents a challenge. The [principle of subsidiarity](#) is central to the way in which the European Union works, and rules out Union intervention when an issue can be dealt with effectively by Member States at central, regional or local level. The Commission is therefore reticent about stipulating specific measures that Member States must apply.

There are reasons to think that setting aside subsidiarity issues might be justified in this instance because, in the words of the Commission's [Guidelines on Impact Assessment](#):

“the problem addressed has transnational aspects which cannot be adequately addressed by action by Member States” and “action at EU level would produce greater benefits compared with action at the level of Member States.”

However, legislation could be framed so as to allow subsidiarity to be respected, following the [approach taken](#) to reducing the consumption of lightweight carrier bags. Here, Member States were given a choice. On one hand, they could take a target-based approach, and implement their choice of measures to ensure that consumption of bags per person drops to specified levels; on the other, they could take a measures-based approach, and ensure bags are not given away for free at the point of sale.

Member States could thus implement the BAT measures, or provide evidence to demonstrate that their proposed alternative would achieve the same or better reductions. The Commission could thereby potentially avoid creating a blanket obligation to undertake difficult and expensive monitoring work that, given the mobility of marine litter, might not even reflect the success of the measures an individual Member State implements.

4.4 Conclusions

The urgent need to tackle marine plastics calls for legislation at a European level. The effect of any such legislation should be to stimulate the introduction of effective measures to prevent plastics reaching the marine environment, whether it does so indirectly (through targets) or directly (by specifying BAT-style measures).

The advantage of the latter approach is that it can quickly lead to the implementation of the most effective measures, and avoid diverting substantial resources into the potentially distracting issue of quantifying marine plastics.

Even working somewhat in the dark, we know enough to know there is a problem that merits urgent action. The key question now is what form that action should take in order to have the greatest effect. There is no time to waste.