

Tackling single-use plastic items in the Mediterranean

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Abstract Overall, plastics are estimated to account for around 95% of the waste in the open sea, on the seabed and on beaches across the Mediterranean. In the Mediterranean, it is estimated an annual plastic leakage of 229,000 tonnes, made up of 94% macroplastics and 6% microplastics [1]. The scope of this paper is to support the development of policy measures and guidelines to reduce/prevent the negative impacts associated with Single Use Plastics (SUP), by presenting information on the production, consumption, end of life management and impacts associated with selected SUP items across the Mediterranean region at present and illustrating the potential effects of different policy measures to reduce these impacts in the Mediterranean context. The research and analysis presented focuses on key SUPs in four Mediterranean countries, namely: beverage bottles, inc. caps and lids; food containers (bowls, clamshells, trays); straws; and cigarette filters in Greece, Egypt, Morocco and Montenegro. The design of policy measures to eliminate or reduce the consumption of problematic single use plastics must, inter alia, take into account the necessity for the item in question, and, where relevant, the availability of alternative products and systems to switch to [2]. The overall recommendations to consider for the policy guidelines, cover: improving waste collection/ separation – particularly along coastal areas and waterways; the use of bans and levies of SUP products to maximise effect; ensuring implementation of Deposit-Refund Systems (DRS) for beverage containers to support 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.

Keywords: Single-Use Plastics, Marine Littering, Deposit-Refund System, recycling, microplastics

1. Introduction

The research and analysis presented in this paper focuses on key SUPs in four Mediterranean countries, namely: beverage bottles, inc. caps and lids; food containers (bowls, clamshells, trays); straws; and cigarette filters in Egypt, Morocco, Montenegro and Greece [3].

The method used for the development of this information document involved:

- A rationale for the selection of countries and selection of SUP items;
- The development of guidance on research and data collection for the national experts in Egypt, Greece, Montenegro and Morocco;
- The identification of a baseline for the selected SUP items in the four countries, on the basis of the information gathered by the national experts (production, consumption, waste management situation)
- The development of potential policy measures to reduce/prevent SUP pollution and an appraisal of their environmental and socioeconomic impacts relative to the business-as-usual scenario. The analysis utilised a model previously developed by Eunomia for DG Environment, European Commission.

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

The main types of alternatives available for consideration include single use, non-plastic alternatives (SUNPs), as well as multi-use alternatives (MUs). It is noted that “biodegradable” plastic, or “bioplastic” alternatives, including bio-based plastics and compostable plastics are not considered credible alternatives for single use plastics at present. This is due to widespread misconceptions regarding the options for their end of life treatment, which in reality, are limited and present no added benefit relative to SUPs, except in very few applications [4]. Further, it is noted that between SUNPs and MUs, only the use of MUs will result in the reduction of litter in the marine and terrestrial environment.

2. Methodology

Through a long list of policy the following list was selected to model, using the following criteria: scale effect (high or low), strength of market demand; the size of the market:

- Information campaigns
- EPR for litter costs - full cost of litter clean up to be covered by producers
- DRS for plastic beverage containers
- Consumption levies - predominantly for food packaging
- Bans

Firstly, the changes in plastic litter reaching the marine environment (in weight-based i.e. tonnage terms) are presented below. This figure clearly shows that, in terms of tonnage, Deposit Refund Schemes lead to the greatest reduction in (littered) marine plastics reaching the environment, in the order of 16 thousand tonnes/year. EPR schemes for litter, which are assumed to lead to a 50% increase in litter collection by 2030, are modelled to reduce marine littering by c. 10 thousand tonnes/year. The combined impact of DRS and EPR (c. 26 thousand tonnes), is equivalent to preventing the leakage of approximately 1,700 truck-loads of plastic waste per year (more than 4.5 trucks per day) into the environment¹.

3. Result & Discussion

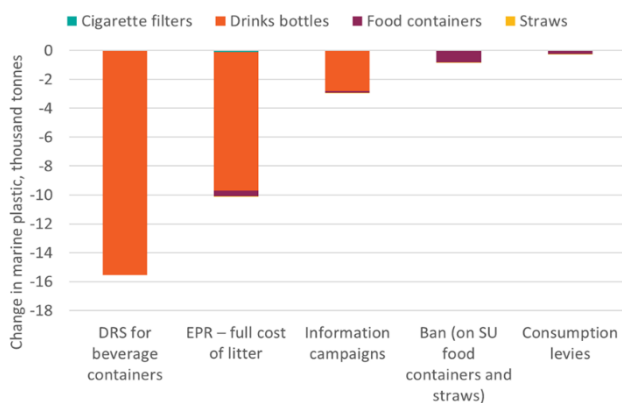


Figure 1: Change in Marine Plastic Litter, Thousand Tonnes, 2030

The modelled change in greenhouse gas emissions for the major sources of emissions throughout the product lifecycle are shown in the Figure below. In terms of greenhouse gas emissions, DRS schemes show the greatest environmental benefit, of approximately 0.6 million tonnes of CO₂ equivalent prevented each year. This is due to the carbon benefits of a significant increase in recycling of plastic beverage containers, with a further contribution from a reduction in plastic sent to incineration. This emissions saving is equivalent to the emissions produced by approximately 240 thousand citizens in one year (equivalent to 0.16% of the total population of the four countries modelled)².

1 Based on 15 tonnes per truck-load: Royal Society Te Apārangi (2019) Plastics in the Environment.

2 Based on emissions of 2.57 tonnes CO₂e per year (data for Greece, Egypt, Montenegro and Morocco, weighted

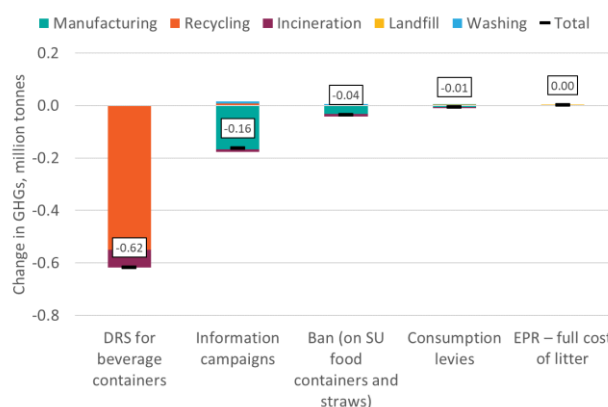


Figure 2: Change in Greenhouse Gas Emissions, Million Tonnes CO₂e, 2030

Concerning the economic impacts of the measures modelled, measures targeting consumption of SUP products (bans and consumption levies) can lead to either an increase or loss in sales, depending on the type of product that consumption is switched to. All measures lead to a loss for producers of plastic products, and net gains are only made by producers where the increased turnover for producers of alternative products is greater than this lost revenue. Producer fees for EPR schemes for litter are approximately €121 million/year, and €185 million for a DRS scheme (assuming a 1 Euro cent producer fee).

DRS schemes have the most significant positive impact on employment, with an estimated 11.5 thousand jobs (FTE) created. Over half these jobs are associated with the running of the scheme, including collections of DRS material, additional staff required by retailers (who are effectively reimbursed through handling fees), haulage, administration and counting centres. Significant jobs are also created through the additional requirements for plastic reprocessing capacity, which could be both at newly constructed domestic recycling facilities or abroad if material is exported. Approximately 3.3 thousand net jobs are created through bans on single use food container and straws. This is due to the implementation of refillable take-away box schemes for food containers, as they require reasonably significant numbers of staff to operate them, in relation to collection and washing. This increase in jobs significantly offsets reductions in manufacturing jobs due to decreased net consumption.

4. Conclusions

The overall recommendations to consider for the policy guidelines, cover: improving waste collection/ separation – particularly along coastal areas and waterways; the use of bans on SUP items to maximise effect; ensuring implementation of DRS for beverage containers to support increased recycling rates, reduced littering of deposit-bearing containers, a reliable supply of high-

by population): Worldbank (2019) CO₂ emissions (metric tons per capita), <https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=EG-ME-GR-MA>

quality recycled material, reduced greenhouse gas emissions and air pollutants; and increased employment. In addition, recommendations include supporting the implementation of Nationwide Potable Water/ Refill Systems, via installation of fully functioning and properly maintained potable water supply systems that provide a reliable and clean supply of water. Finally, improving data availability and data collection is recommended, via the development of a national packaging registry focused on gathering the evidence required to monitor and enforce compliance, as well as maximising sorting of plastics from residual waste prior to landfill / recovery.

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