



Preliminary Research to Assess the Impacts of a Ban or Restrictions in Sale in Wales of Items in the EU's Single Use Plastics Directive

Summary

1. Research aims and methodology

- 1.1 The Single-use Plastics Directive (EU/2019/904) was adopted by the EU in June 2019¹. The Directive highlights the environmental impacts of single-use plastics and fishing gear, and sets out measures for Member States to reduce their impact. One of the measures is a market restriction that prohibits placing particular single-use plastic products on the market, effectively forming a ban on the import and sale of these products. The Directive lists nine categories of single-use plastic products earmarked for prohibition from the market², all of which are consumer products or packaging which have readily available non-plastic alternatives.
- 1.2 This report presents findings on the potential economic, social, and environmental impacts in Wales of a ban or restrictions in sale of items in the EU Directive. It is not a full policy impact assessment. The research is intended to be used as an evidence base for the Welsh Government and to support any future public consultation.
- 1.3 Desk-based research methods were used to explore the potential environmental, economic and social impacts of the ban or restriction in sale, and unintended consequences that will need to be considered. It builds upon previous work conducted by the researchers^{3,4,5}, with additional research undertaken through a literature review, consultation with 29 key stakeholder organisations, and a quantitative model to understand the potential impacts in Wales.

¹ [EU Directive](#)

² Cotton bud sticks; cutlery (forks, knives, spoons, chopsticks); plates; straws; beverage stirrers; sticks to be attached to and to support balloons; food containers made of expanded polystyrene; beverage containers made of expanded polystyrene, including their caps and lids; cups for beverages made of expanded polystyrene, including their covers and lids

³ [A preliminary assessment of the economic, environmental and social impacts of a potential ban on plastic straws, plastic stem cotton buds and plastics drinks stirrers](#)

⁴ [A preliminary assessment of the economic impacts of a potential ban on plastic cutlery, plastic plates and plastic balloon sticks](#)

⁵ [A Preliminary Assessment of the Economic Impacts of a Potential Ban on Expanded Polystyrene Food and Beverage Containers](#)

2. Key findings

Environmental impacts

- 2.1 The literature review showed that a diverse group of items are found as marine litter, including products from public consumption, fishing, aquaculture, farming, plastics production, and other industries. Specific products are targeted in the EU Directive, largely based on their prevalence in beach litter surveys. These products are among the 10 single-use plastic products most often found on Europe's beaches and seas.
- 2.2 Not all of the products in the research scope are separately categorised and recorded in marine litter surveys. Of the products recorded, a recent survey by the Marine Conservation Society found that cotton bud sticks, and plastic/polystyrene cutlery, trays, straws, food containers and cups account for 3.8% of beach litter by item count. By far the most common beach litter problem is small plastic or polystyrene pieces (18%), which are often the result of plastic products degrading and fragmenting into small pieces. It is particularly difficult to identify the source and product from which small polystyrene pieces originate, but the data suggests that around 30% of all beach litter comes from public littering behaviour.
- 2.3 The impact of marine litter on the environment, the ecosystems it supports, and human health is the subject of ongoing scientific research, and the potential threat from microplastic pollution is a particular source for concern. As the full impact and costs are not known, many organisations adopt the precautionary principle in their approach to marine litter.
- 2.4 Litter is a form of pollution and reflects failures both to manage resources and waste responsibly and to limit end of life impacts. In economic terms, litter creates an external cost known as a 'negative externality'. A negative externality exists when the activity of one agent (such as the producer and/or end user of a product) cause a loss of welfare to another agent, which is not compensated. In these circumstances, because of the negative externalities associated with the product, the marginal societal costs of producing the product exceed the private costs faced only by the producer/supplier of the product, and a 'market failure' is said to have occurred. Without government intervention the good or service will be under-priced, or over-produced, or both, and the negative externalities will not be taken into account. Overall, there is a loss of economic welfare.
- 2.5 Single-use products are typically sold to consumers at a low price or provided 'for free' as part of a general product or service, such as drinking straws provided in fast-food restaurants and disposable plates at outdoor events. The external cost created by litter is not reflected in the product market price, and receptors and people affected by the litter (including the public and wider environment) are not compensated. The free market does not lead to an efficient outcome, so there is an economic rationale for some form of government intervention to address this market failure. The implementation of a legislative ban or restriction in sale is one of the key options available.
- 2.6 Through the desk-based research, non-plastic alternatives were found for all products available to the Welsh market, with the exception of beverage carton straws which are also used to pierce the seal on the drink. The most common alternatives for the other products are manufactured from paper, wood, and bagasse. These materials decompose much faster than plastic in the marine environment⁶, and so the marine litter impacts will be reduced if the market switches from plastic to non-plastic single-use items as a result of the ban or restriction in sale.
- 2.7 Life cycle analysis can be used to understand the impact of a product across a wide range of environmental concerns and considering the full product life cycle from production to end of life. Whilst life cycle analysis does not measure impacts on litter or levels of consumption it does

⁶ [Marine Debris Report](#)

highlight other key environmental risks. It is common for life cycle analysis to reveal a compromise or trade-off between products, with one performing better against one impact area and worse in others. The results can help prevent 'burden-shifting' from one impact area to another, e.g. reducing marine litter but increasing greenhouse gas emissions or shifting impacts from end of life to the production or use phases.

- 2.8 Two recent life cycle analysis studies compared the environmental impacts of single-use plastic and non-plastic products for many of the items covered by the ban in the EU Directive, one study commissioned by the European Commission⁷ and one by the Danish EPA⁸. On the whole, the studies found that the single-use non-plastic products analysed performed better or on the same level as single-use plastic products. Sensitivity analysis highlighted the need to optimise and lightweight non-plastic products wherever possible, particularly with regards to impacts on indirect land use changes from biomass production.

Social impacts

- 2.9 The EU Directive contains certain exemptions from the ban, e.g. where specific groups would be disproportionately impacted, and requests for further exemptions were raised in the Defra consultation⁹. These include medical-enabling straws used to administer pre-dosed granular medicines in hospitals and homes and flexible plastic straws used to assist/enable drinks and liquid food consumption in patient groups with specific needs.
- 2.10 Stakeholders contacted for the research discussed potential social impacts, particularly with regards to vulnerable groups such as people with disabilities or decreased mobility. There was overwhelming support for exemptions for such groups and for medical applications. While some argued for an exemption if food safety issues could be proven, others believed that no exemptions should be allowed to avoid loopholes and distortion of the market. Public consultation would help to identify all such cases for exemption.
- 2.11 The need to communicate any new rules and regulations in several languages was highlighted by stakeholders in respect to the different languages spoken in Wales. Customer product preferences and the potential loss of utility in switching to non-plastic alternatives were also raised as considerations.

Market research

- 2.12 Limited data was found relating to the quantity of products placed on the market for the items in scope of this research. Estimates for Wales were made by scaling previous estimates for England on a population pro-rata basis. Of these estimates, the products sold in the largest volumes were 226 million units of cutlery sold each year and 199 million drinking straws, and the smallest product markets were 11 million drinks stirrers and 1 million balloon sticks by volume.
- 2.13 Estimates of the current market split between plastic and non-plastic products were triangulated from previous research and stakeholder comments. A large number of cotton buds are now sold with non-plastic stems and drinking straws have also experienced a strong shift away from plastic due to recent public and media attention. Beverage carton straws on the other hand are still almost entirely manufactured using plastic for the reasons stated above in section 2.6.

⁷ [Life Cycle Inventories of Single Use Plastic Products and their Alternatives](#)

⁸ [Life Cycle Analysis of Single Use Plastic Products in Denmark](#)

⁹ [Consultation on proposals to ban the distribution and/or sale of plastic straws, plasticstemmed cotton buds and plastic drink stirrers in England](#)

- 2.14 Preliminary market research identified manufacturers of both plastic and non-plastic items for these products in Wales, indicating that a ban or restriction in sale will create both opportunities and challenges for businesses in Wales. Market leaders in the manufacturing sectors relating to the products in scope were also researched and one potential site identified in Wales (a major manufacturer of EPS food containers, amongst other products, with a site in Newport). It will be important to continue to engage manufacturers and conduct a public consultation to further understand the impacts of the ban or restriction in sale on the Welsh economy.
- 2.15 A ban or restriction in sale will also affect Welsh businesses where they use or sell the products. There will be transition costs (sourcing new products, adjusting processes and equipment), but stakeholder engagement revealed that overall impacts for these business are likely to be small if non-plastic products are a comparable cost and where these products represent a relatively small proportion of business costs as a whole.
- 2.16 Of the 21 stakeholders providing an opinion on whether their organisation would be likely to support a ban on the proposed products, 14 stakeholders indicated that they would generally be supportive of a ban. Another three stakeholders supported the ban but provided some remarks to qualify their response. Most of these centred around doubts that the full range of implications to business (and manufacturers particularly) had been considered, and that these businesses need expert support when going through the process of changing product lines. A further two stakeholders said they would not support a ban if it included oxo-biodegradable plastics. Two stakeholders indicated that they would not support a ban, on the grounds that the products in question make up a small proportion of the quantities of plastic waste in the terrestrial and marine environment. They felt that the ban would further “demonize” plastic, taking attention away from the fact that the root cause of the problem is littering and using single-use items generally. Defra conducted a public consultation on the proposed ban of the distribution and/or sale of plastic straws, plastic-stemmed cotton buds and plastic drink stirrers in England in 2019. The large majority of respondents supported a ban (80-90% in favour, depending on the product)¹⁰.

Economic impact estimates

- 2.17 Estimates were made of economic, social and environmental impacts of a ban using a quantitative model and presented in monetary terms of net present value over a 10-year period from 2021 to 2030. The greatest economic impacts estimated were seen in the increased sales value, which increased by 11% (£14 million) across the product group as a whole, driven by the price difference between plastic and non-plastic products. It is not clear the degree to which these increased costs would be absorbed by Welsh businesses and the degree to which they would be passed on to the consumer.
- 2.18 The revenue to UK manufacturers is the second most significant economic impact estimated in the model, increasing by 46% (£9 million). This revenue could be retained in the Welsh economy if Welsh manufacturers respond to the demand for non-plastic products. Indeed, as these products are also likely to be banned across the EU there are significant opportunities for an export market. However, manufacturers of plastic products will lose revenue, and these losses are accounted for in the model.
- 2.19 Visual disamenity costs were estimated in the model for terrestrial and beach litter. The terrestrial visual disamenity costs were highest (£24 million) but the impact of the ban was relatively small (£0.4 million reduction in costs) because most terrestrial litter is cleaned up quicker than the decomposition time of the non-plastic materials. Beach litter visual disamenity costs are smaller (£2.6 million) but a ban could reduce this by 91% (£2.4 million reduction in costs). Switching from

¹⁰ [Consultation on proposals to ban the distribution and/or sale of plastic straws, plasticstemmed cotton buds and plastic drink stirrers in England](#)

plastic to materials that degrade quicker in the marine environment will reduce the amount of litter accumulating over time and therefore reduce these impacts.

- 2.20 Carbon emission impact estimates modelled were on the whole minimal, with a small reduction in traded CO₂e emissions in the UK as the result of a ban, and an even smaller reduction in global emissions outside of the EU.
- 2.21 Limitations were identified in the market research, particularly relating to the availability of comprehensive and accurate data for Wales. Sensitivity analysis was therefore conducted in the model to test the impact of uncertainty in assumptions, data sources and approaches to forecasting the market response to a ban. Market growth sensitivity analysis highlighted the impact that the signalling effect of a ban could have, i.e. if demand for these single-use products is reduced, irrespective of the material choice, due to renewed public interest and environmental awareness. When estimating the impact of the ban in the model, the most pronounced effect of reducing consumption, for the values tested, is on terrestrial litter impacts (estimated benefits increase by 162%), sales value (reduced by £7.1 million) and revenues to manufacturing (reduced by £3.3 million). For further limitations of the data, please see the main report.
- 2.22 Other model sensitivity analysis tested uncertainty in the volume of sales units placed on market, unit weights and prices, the speed at which the market will shift voluntarily without a ban, and the litter impacts associated with these products. The results reflect the combined effect of sensitivity values tested, which do not act in the same direction for all impact areas. The main effect of this sensitivity analysis is upon sales value and revenues to UK manufacturing. For sales value, a key driver is the product unit prices. The modelled prices of non-plastic products were halved (e.g. through future market growth, economies of scale and increased competition), or doubled (e.g. if non-plastic alternatives are at least double the price of single-use plastic products and continue to be so for the next 10 years). This represents a very broad range of possible price points. In the lower sensitivity implementing a ban creates a cost saving to consumers and businesses purchasing these products. In the upper sensitivity, the overall market value increases but the impact of the ban is not significantly altered.
- 2.23 The sensitivity analysis also covered uncertainty in litter data (halving / doubling the proportion of litter made up of these products) and visual disamenity estimates (testing the upper and lower bounds derived from willingness to pay studies). The most profound impact of this is seen in the upper sensitivity results where terrestrial litter visual disamenity costs are increased and the ban creates a greater benefit (270% increase resulting in £1.4 million cost saving).
- 2.24 When interpreting the model impact estimate results, it is important to consider a number of methodological limitations. The key consideration in the economic impacts is that the full investment and transition costs could not be estimated for manufacturers in Wales until further detail is provided. This data gap could be addressed through a public consultation exercise. It is also important to bear in mind that visual disamenity is one aspect of marine litter that can be quantified and monetised but it does not encapsulate the full impact of plastic pollution on the marine environment, wildlife and ecosystems, which is still being investigated by the scientific community.

3. Conclusions

- 3.1 This preliminary research explores the economic, social and environmental impacts of a ban or restriction in sale in Wales. Readers should bear in mind the limitations of the data when interpreting the results of this research. For further information on these limitations, see the full report. The environmental benefits are partly represented in the visual disamenity cost of these products when found as beach litter, which the model estimates to fall by around 91% under a ban.
- 3.2 The main economic impact is an increased cost to those purchasing the products, although as this cost is spread across a very large number of individuals and businesses the marginal impact on each is small. The economic value generated by these products is expected to shift from the supply

chain of the plastic products to those producing non-plastic alternatives, with a net increase in revenue for UK manufacturing. This value, and the wider European market for non-plastic products, represents an opportunity for growth within the Welsh economy.

- 3.3 The supply chain for single-use plastic products will be the most severely affected by a ban. The preliminary research did not identify a substantial manufacturing base in Wales for these products, the majority of which are thought to be imported from overseas. The manufacturers in Wales that are affected will bear investment costs to adapt production or will suffer revenue losses.
- 3.4 Public consultation is recommended to seek further information from stakeholders on support for the ban, the likely impact on business, and further exemptions that should be considered to protect vulnerable groups and avoid unintended consequences.
- 3.5 Any legislation around a ban or restriction in sale of single-use plastics should be drafted to avoid confusion and ambiguity, and key issues to consider have been highlighted in the report. Communication and engagement around the ban and its setting in the wider context of work on environmental issues will encourage support from businesses and the public. A successful ban will contribute towards tackling marine litter in Wales, and help protect marine and terrestrial natural environments.

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Available at: <https://gov.wales/impacts-ban-or-restrictions-sale-items-eus-single-use-plastics-directive>

Views expressed in this report are those of the researchers and not necessarily those of the Welsh Government

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This document is also available in Welsh.

