Marine Scotland commissioned research on the plastic value chain in Scotland

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Marine Scotland commissioned research on the plastic value chain in Scotland to understand the trade-offs and key decision points of businesses. The aim of this was to identify opportunities for effective Scottish Government actions to tackle the marine plastic problem. Whilst consumer behaviour receives regular attention in the littering and plastic pollution policy discussions, little is known on the options, drivers and barriers faced by businesses that indirectly or directly lead to marine plastic pollution. The specific objectives of the research were to:

- Identify key points and decisions in the supply chain where plastic leakages occur or are derived from and a review of why this happens.
- Provide a review of the drivers, barriers and current support provided towards preventing marine plastic pollution.
- Present conclusions on effective levers for the Scottish Government to reduce marine plastic pollution.

Resource Futures were commissioned to carry out this research project. The research would not have been possible without the stakeholder engagement across industry and third sector organisations.

Research Approach

The project used interviews and workshops with businesses and stakeholders to develop flow charts of marine plastic pollution appended with detail on key decision points, groups involved, pressures faced and potential solutions to the marine plastic leakages across the different product supply chains. Reasons for the pollution in each case were explored and mitigation options were discussed.

The research focused on a handful of problem products, chosen based on potential opportunities to influence in Scotland and an assessment of impact in terms of contribution to the marine plastic problem. The products were:

- commercial fishing gear
- artificial grass pitch
- menstrual products
- crisps, snack and sweet wrappers.

The project reports consists of a summary document, a literature review and individual reports on commercial fishing gear, artificial grass pitch, menstrual products and crisps, snack and sweet wrappers. These documents are available in the Supporting documents.

Research Findings

Overview

Of the products studied, key pollution points in the supply chain commonly occur during their use and at the end of life. Considering this in isolation would suggest the consumer or end user is responsible for stemming the tide of marine litter. The research found that the drivers for this pollution were heavily influenced by decisions made further up the supply chain. For example, the loss of microplastic crumb from artificial pitches during use could be avoided or reduced through different design and procurement decisions. There is a disconnect, however, between who bears the additional cost of the mitigations and the wider society who benefit from the reduced microplastic (or the avoided cost of not dealing with the clear up).

Commercial fishing gear

Commercial fishing gear is regularly found in marine litter surveys and is particularly problematic due to the long lasting impacts of ghost fishing, ingestion and entanglement. Modern nets and fishing gear typically contain a mixture of different plastic polymers. Gear may be lost accidentally but there are also reports of it being intentionally dumped at sea or sabotaged by other users of the marine environment. The research found stakeholders, including large and small fishing groups, ports and harbours, environmental groups and academic researchers, net producers and waste management businesses were positive about taking action to tackle marine plastics from fishing.

Fishing is a dangerous activity and risks of injury or worse are increased when handling damaged gear, therefore it is not always possible to recover lost nets or gear, even if the gear hasn’t yet been swept away. However, much of the gear used by Scottish vessels is expensive to dispose of both in terms of cost, time and access to appropriate infrastructure. No strong incentive currently exists, other than environmental stewardship, to dispose of nets appropriately. This increases the risk of nets being lost at sea or being stored indefinitely in secure or insecure locations (sheds or on the harbour side).The Scottish Government is working as part of our British Irish Council commitment to improve recycling opportunities for fishing gear and to address the knowledge gap around how much fishing gear is in storage, how much is bought each year and how it is managed around Scotland.

Peterhead Port was an exemplar in this area. A pilot was underway raising awareness of the problem with fishers and the local community. Infrastructure and space was provided for vessels to land their waste and a ‘leader board’ was used to recognise good behaviour among the fish vessels operating from the port. Harbour dues include a flat fee for waste disposal meaning that fishers aren’t penalised for responsible waste disposal.

Not all ports however can afford to offer this services on a flat fee or indeed have the infrastructure required to handle large quantities of waste such as fishing nets at end of life. Furthermore, even if waste is managed appropriately the vast majority currently ends up in landfill.

Menstrual products

In the 2018 MCS Great British Beach Clean survey[1], sewage related debris (menstrual products included) accounted for 12.6% of coastal litter in Scotland, compared with a UK average of 6.2%. In a survey of the public conducted as part of this research, 24% of respondents indicated that they always or frequently flushed tampons and 9% always or frequently flushed sanitary towels. Once flushed down the toilet they can cause blockages in the sewage network and may be discharged to waterways either via combined sewage overflows or occasionally from passing through waste water treatment. Plastics are found in the actual tampons and pads, as well as in applicators and wrappers. Plastic-free versions are available but are less popular in Scotland, potentially due to convenience, habit and marketing behaviour. Similarly, reusable cups and period pants are available but their market share is so far small.

The upfront cost of reusable cups and pads are higher than single use products but over the length of time in use are significantly cheaper. Whilst this is good for the consumer over the longer term, if the upfront cost is affordable, this represents a significant revenue loss to suppliers in this market. This is illustrated by the research findings around the number of new businesses supplying the reusable and plastic free menstrual product market compared to the incumbent suppliers largely resisting changing their main offer. Further, competitive advantage is gained by including plastic elements to increase perceived user convenience.

Zero Waste Scotland recently ran the “Trial Period” campaign[2] which aimed to raise awareness of and encourage the use of reusable menstrual products. The campaign also involved distributing 2,000 reusable products for people to trial and encouraging them to complete a survey to gather experiences.

Artificial Pitches

Artificial grass pitches are a valuable resource in Scotland helping to keep our population fit and active all year round. Modern pitches are manufactured using plastic-based crumb to improve the playing surface for performance and safety. This plastic-based crumb can be lost from pitches on players boots and clothes or by wet and windy weather. It can then find its way down drains either in the street or through

[1] https://www.mcsuk.org/clean-seas/great-british-beach-clean-2018-report
[2] https://www.trialperiod.scot/

showers and washing machines. Losses also occur at the end of pitch life during removal, transportation and storage – if not handled and managed appropriately.

A key issue was highlighted regarding improper waste management of these pitches. It was suggested that some companies are transporting and disposing of pitches illegally in storage facilities. Better enforcement and audit of waste transfer notes could reduce the incentives of managing waste in this way.

Mitigations are available in the form of: designs to minimise the loss of the plastic-based crumb during use i.e. barriers and scrapers for shoes; alternative materials, and; next generation pitches. However, these mitigations are not being implemented as there is little understanding of the problem at the key points in the value chain.

The installation and disposal of pitches in Scotland is largely procured by local authorities. Maintenance may also be included as part of the same contract. Discussions at the workshop suggested that procurement exercises are driven almost entirely by cost whilst environmental issues are not valued. This puts any suppliers wishing to improve the sustainability of pitches at a competitive disadvantage. Even if the mitigations are cost neutral, the understanding is not there to counter the risk of a slightly different product.

Fidra[3], a Scottish environmental charity based in East Lothian, together with KIMO International[4] have produced best practice guidelines for minimising plastic loss from artificial pitches. They have also developed “Pitch In!”, a community toolkit to engage the public and users of pitches and provide some practical examples of ways to reduce plastic loss.[5] The research highlighted the need for better standards on environmental requirements in procurement and pitch management since the industry is so cost competitive.

Crisps, snack and sweet wrappers

Wrappers are consistently one of the top categories identified in marine litter surveys. They are mostly used on products that are designed to be eaten on the go meaning that packaging is required per serving and must be designed to keep the product fresh, protected from damage, light-weight and appetising. These attributes mean that materials containing plastic are most commonly used and unfortunately these materials are also very difficult to recycle and therefore have little value after being used as a wrapper.

Very little of the value chain for this product category is located within Scotland. Initial research identified few opportunities for Scottish Government to act on marine plastic originating from this industry. International brands are less likely to voluntarily

[3] https://www.fidra.org.uk/
[4] kimointernational.org/
[5] http://www.kimointernational.org/pitch-in/

modify product design to suit one market and so international collaboration would be required to create change in this industry. Scotland could take the opportunity to show leadership in this area by engaging international action.

As with other products there is no single silver bullet and any intervention would benefit from a holistic approach. The research identified the following recommendations for crisp, snack and sweet wrappers: voluntary agreements, packaging innovation, increasing recyclability and extended producer responsibility. A pan-UK consultation on reforming the UK packaging producer responsibility system closed in May 2019, the research noted that industry are currently waiting for a clear steer from government on future directions.

Recommendations and next steps

Key conclusions and recommendations;

a. Points of pollution commonly occur during product use and at the end of life. Considering this in isolation would suggest the consumer or end user is responsible for stemming the tide of marine litter. Whilst consumers hold a lot of purchasing and lobby power, **tackling the problem further up the supply chain can be much more efficient and can make it easier, and more likely, for the consumer to do the right thing**.

b. **Innovation in fishing gear materials and recycling is needed to avoid the majority of waste ending up in landfill or as marine litter. Funding from the Scottish government could be directed towards innovation**. The research identified spillover benefits from such innovation due to the global nature of fishing and the marine litter problem and therefore a potential opportunity for international collaboration.

c. **With menstrual products the research found consumer behaviour, habits and norms are formed at an early age and are influenced by parents, friends and education received**. It was noted in the stakeholder workshop that the majority of classroom education on periods is sponsored by the big brands at which point free samples are provided. There is a potential option to support behaviour change by providing alternative products and incorporating key messages on disposal at this first point of use.

d. A representative from Cyrenians[6], an Edinburgh based charity involved in distributing free sanitary products to those in need, highlighted the impact of the cost difference between reusable and single-use products. The funding they receive is limited and over a relatively short time period they can reach more people by providing single use products compared to reusable products. **This could be addressed by increased funding or by ring-fencing some funds for reusable products given the longer term cost-effectiveness assuming that any immediate risk of Period Poverty is also addressed.**

e. As long as the producers and brand owners of tampons and pads do not face the negative impacts (blockages in the sewage network, losses to our tourism industry, environmental consequences of microbial contamination and the transport of invasive species) **single-use menstrual products will continue to dominate the market.**

f. **In general there is a strong appetite across industries to help tackle the marine plastic problem.** Businesses are, however, driven by profit and so competitive fairness is important, alongside perception of risk and dependence on norms or traditions. **Accreditation and a green procurement framework were suggested as options to reduce plastic loss from artificial pitches**. Any standards would need to work in parallel with those used by FIFA and World Rugby and would also need to account for cost, safety and performance. Creating the right incentives are key to allow the market to innovate and develop the solutions.

g. **Appropriate waste management infrastructure and enforcement is essential for the majority of product types**. This was exemplified by end of life management of artificial pitches as it was suggested that some waste is stored indefinitely or handled illegally.

Whilst the products researched all share the common problem of being a marine litter pollutant, the research highlights the need to design solutions around the particular barriers and drivers faced in different product areas in order to be effective. The four shortlisted products were used as examples of how solutions differ depending on the make-up of the sector and the reasons for the plastic ‘leakages’. When considering other problem products this research could be used to assess similarities across attributes and the transferability of potential solutions.

[6] https://cyrenians.scot/

The findings of this research contribute to a better understanding of the types of levers available to tackling the marine plastic problem in Scotland beyond both consumer behaviour change and progress made so far on certain products.

Understanding business behaviours and motivations is crucial to designing effective interventions and this research provides that initial foundation for expanding the effort on stemming the plastic tide in Scotland.

This publication is available at **www.gov.scot**

Any enquiries regarding this publication should be sent to us at

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