

Is banning single use plastic products the answer to the world's plastic crisis?

2018-19 M5X01238 Design for Manufacture
Georgia Hatton
BSc Product Design & Technology

Since the 1950s the production of plastic products has outpaced that of most other materials, a large proportion of which was designed to be disposed of after its first use. This frivolous attitude has meant that in the last 60 years we have produced a massive 6.9 billion tonnes of plastic waste globally, 6.3 million tonnes of which was never recycled or repurposed leaving it in landfills, dumps and strewn throughout the ocean, Parker (2019).

In 2017 40% of plastic produced worldwide was used to make products and packaging that were discarded after their first use according to Parker (2019), to combat this issue a European directive has been backed by UK MEP's to ban single use plastic products that have a readily available alternative already on the market. The bill still needs to pass additional procedural measures before it can go into effect, but officials say its chances look good and could begin enforcement as early as 2021. plastic straws, stirrers and cigarette filters will all be amongst the disposable products covered by the proposed legislation as they account for around

70 per cent of marine litter, according to the European Commission, Parker (2018), Belgian MEP Frédérique Ries, who originally proposed the bill, called it "a victory for our oceans, for the environment and for future generations," BBC News (2018).

However, a ban on single use plastic products will cause the consumer to seek alternatives, sometimes these alternative options aren't always necessarily less environmentally damaging just because they're composed from non-plastics. For example, if a ban on plastic shopping bags were to be introduced then the popularity and consumption of paper bags would increase, though paper shopping bags are in fact more damaging to the environment when the entire life cycle of the bag is considered. The raw materials, energy used to make the bag, transportation emissions and environmental costs of storage are all factors that affect the carbon footprint of the product and when these factors are considered wholly then the paper bag trails in comparison to the plastic shopper. From raw material to final product it takes almost four times as much energy to manufacture a paper bag as a plastic bag, Howard (2019). Additionally Paper-bag manufacture uses 20 times as much water and requires more energy to be recycled when it reaches the end of its life. In this instance the plastic shopping bag should not be banned but instead integrated into a circular economy

where expired old bags are recycled and made into new.

An alternative to the banning of single use plastics as proposed by the European directive would be to introduce a levy on harmful single use items that are usually given as a complimentary in order place greater importance and a monetary value on the items that are usually disregarded straight after use. This methodology was employed by the uk when they introduced the 2015 shopping bag levy. The introduction of the 5p charge per plastic bag proved extremely successful as the following year the number of bags used was reduced by 80%, Barkham (2011), the success of the scheme was largely attributed to the cost of the bag making people think twice about the value of the bag rather than viewing it as a disposable item. Of the seven major food retailers in the uk, six still offer single-use bags that are 0.07mm thick (still deeming them 'single-use'). Sainsbury's has replaced all of its plastic bags with stronger, reusable carrier bags that are slightly thicker than the 0.07mm "single-use" standard, additionally they offer free replacements when the thicker variants wear out. Interestingly the thicker bags fall outside of the new law, meaning they are not reported in the annual figures - thus Sainsbury's seeming to have sold 585 million fewer 'single-use' plastic bags in 2016, than the previous year, Smithers (2016).

The very idea of manufacturing plastic items like shopping bags, which we use for an average of 12 minutes Newsroom (2017) but can remain in the environment for nearly half a millennium—is arguably an incredibly irresponsible exploitation of technology. In India, "The Coimbatore Corporation" has produced an eco-friendly alternative to plastic bags made from tapioca, potato, banana peel and sugar cane which completely dissolves within water after just a few minutes and is 100% naturally biodegradable, 5Gyres (2019), this new innovative technology is being adopted by some of India's biggest corporations and will massively reduce the mass of plastic waste in India per year. Unfortunately, as the tapioca bags are still made using fairly new technology the cost per unit is still pretty high, as a result there has been substantial difficulty in getting the bags to be used throughout India due to the price per unit being significantly higher than its plastic predecessor.

Though "The Coimbatore Corporation's" tapioca bag is naturally biodegradable, other products which are labelled as just 'biodegradable' are often not as easy to dispose of, but in fact require the 130-degree heat of an industrial composter, Coinbatore (2018). Even then, most industrial composters only accept plastics of a certain standard in order to ensure that they leave no fragments behind that can harm the environment or human health, thus a vast proportion of rejected plastics end up

returning to landfill anyway, rendering the whole process futile. In 2015 the United Nations Environment Programme disregarded the development of processed biodegradables as an impractical solution to the world's plastic crisis and declared that it would not reduce the amount of plastic flowing into oceans nor would it prevent physical harm to marine life, but instead encourage a culture of littering, National Geographic (2019).

In 2018, two hundred and fifty organisations responsible for 20% of the world's plastic packaging waste joined together as part of the "new plastics economy global commitment" (12), the initiative is a collaborative deal with the United Nations to promote a circular economy of plastic waste and to encourage the reuse and repurpose of plastic before it reaches landfill. By creating a circular plastics economy stewardship over the product is placed back on the original manufacturer, this system is far more successful as the original producer is given incentive to operate in a more environmentally conscious manner. Corporations joining the commitment must also begin to phase out single use plastic packaging or ensure that they can be re-used within the circular economy by 2025, this vow will significantly reduce the usage of virgin plastics for unnecessary products and packaging.

With the shift towards large corporations being encouraged to take greater responsibility for the end of life of their products, by 2020 Starbucks

plans to replace straws with a plastic, straw-less lid called 'Sippy cup'. By their calculations, this switch actually adds between 0.32 and 0.88 grams of plastic per drink, compared to the weight of their current plastic lid and straw combo. Though their argument is that although the new Sippy cup lids are greater in plastic consumption, they are now recyclable, whereas the plastic straws currently in use are not. The switch has been heavily criticised as Starbucks has not yet specified whether the new 'Sippy cup' lid will be made of a recycled composite or of entirely virgin plastic which would have an extremely detrimental effect if the lids do not to re-enter the circular economy, Ellen McCarthy Foundation (2017).

The banning of single use plastics will definitely have a beneficial effect on our global plastic consumption as by reducing the availability of harmful products people will be less inclined to see them as a necessity as they once did before, ultimately the irresponsible use and disposal of these plastic products can be blamed on uneducated consumer behaviour paired with the lack of alternative products of the same quality and price. Furthermore the items chosen to be banned must have less environmentally damaging replacements or the entire process would be deemed pointless, if there is no readily available replacement then the product should be assessed on how it could qualify for an end of life scheme so that it

doesn't end up in landfills or the sea as it does now.

If single use plastic products were to be banned outright then it would leave the impression on society that the plastic pollution problem has been solved without much discussion of systematic solutions to the damage that has already been caused. Though reducing the production of further unnecessary products is a step in the right direction, further projects like the next wave coalition, should be undertaken, Nace, T (2018). The next wave coalition works with major companies to redirect plastic streams away from the sea by employing people to collect discarded plastic within 30 miles of waterways, The collected plastic is then shipped to manufacturers which can reuse it in lieu of making new products for the future. The collection sites are chosen relative to where it will make the greatest impact, and what existing recycling plants are already available thus reducing infrastructure costs and transportation emissions. Multinational companies such as Ikea and Dell are all ready part of the next wave coalition and have vowed to move their companies towards a more sustainable future.

In order to truly curb the overwhelming production of further unnecessary plastic products and packaging greater emphasis needs to be placed on incentivised schemes which encourage not only big businesses but also the consumer at home to actively return expended

plastic products to designated points and to consider further ways of reducing the unnecessary plastic waste, this in turn will start to change frivolous attitudes towards single use plastic products and waste in general. Norway's plastic deposit scheme is a perfect example of an effective incentivised scheme as its success is unarguable, 97% of all plastic drinks bottles in Norway are recycled, 92% of which are recycled to such a standard that they can be re-used less than 1% of plastic drinks bottles consumed then end up in the environment, National Geographic (2019). If this sort of scheme could be extended further over a broader range of products, then there would be a collaborative effort between large corporations and normal people at home all working together to reduce the irreversible damage that plastic waste is currently doing to our planet

To successfully reduce harmful plastic waste in a constructive way, it would be naïve to think that we can just ban bad products, instead we must employ intelligent design and invest in viable alternatives that are of the same standard and quality. Only then we will be able to turn the tide on plastic pollution.

Bibliography

Parker, L. (2019) *National Geographic*. [Online] Available at: <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/>. (Accessed: 07/03/2019)

Parker, L. (2018) *National Geographic*. [Online] Available at: <https://news.nationalgeographic.com/2017/07/plastic-produced-recycling-waste-ocean-trash-debris-environment/>. (Accessed: 07/03/2019).

BBC News (2018) *Single-use plastics ban approved by European Parliament*. [Online] Available at: <https://www.bbc.co.uk/news/world-europe-45965605>. (Accessed: 11/03/2019).

Howard, B, Gibbens, S, Zachos, E and Parker L (2019) *Fast Facts About Plastic Pollution*. [Online] Available at: <https://www.nationalgeographic.com/environment/2018/07/ocean-plastic-pollution-solutions/>. (Accessed: 10/03/2019).

Barkham, P (2011) *Paper Bags or Plastic Bags: What are Best*. [Online] Available at: <https://www.theguardian.com/environment/shortcuts/2011/dec/20/paper-plastic-bags-which-best>. (Accessed: 12/03/2019).

Smithers, R (2016) *England Plastic Bag Usage Drops 85% Since 5p Charge Introduced*. [Online] Available at: <https://www.theguardian.com/environment/2016/jul/30/england-plastic-bag-usage-drops-85-per-cent-since-5p-charged-introduced>. (Accessed: 11/03/2019).

NewsRoom, E (2017) *Plastic bag charge: 10 fascinating facts about the scheme's sustainability success* [Online] Available at: <https://www.edie.net/news/5/Plastic-bag-charge-UK-sustainability-statistics-from-Defra-2017/>. (Accessed: 08/03/2019).

5Gyres (2019) *Take Action: Plastic Bags* [Online] Available at: <https://www.5gyres.org/plastic-bags/>. (Accessed: 09/03/2019).

Coinbatore (2018) *Plastic Waste* [Online] Available at: <https://www.ccmc.gov.in/ccmc/index.php/ccmcnews/use-alternatives-to-plastics>. (Accessed: 09/03/2019).

National Geographic (2019) *You Can Help* [Online] Available at: <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-solutions-waste-pollution/>. (Accessed: 08/03/2019).

Ellen McCarthy Foundation (2017) [Online] Available at: <https://newplasticseconomy.org/projects/global-commitment>. (Accessed: 12/03/2019).

(1) Nace, T (2018) *Starbucks to ditch plastic straws* [Online] Available at: <https://www.forbes.com/sites/trevornace/2018/07/10/starbucks-to-ditch-plastic-straws-worldwide-for-adult-sippy-cups/>. (Accessed: 11/03/2019).

National Geographic (2019) *Running list of action on plastic pollution* [Online] Available at: <https://www.nationalgeographic.com/environment/2018/07/ocean-plastic-pollution-solutions/>. (Accessed: 10/03/2019).

Taylor, M (2018) *Can Norway help us solve the plastic crisis* [Online] Available at: <https://www.theguardian.com/environment/2018/jul/12/can-norway-help-us-solve-the-plastic-crisis-one-bottle-at-a-time>. (Accessed: 10/03/2019).