



ALL-PARTY PARLIAMENTARY GROUP ON MICROPLASTICS

MICROPLASTIC POLICIES FOR THE GOVERNMENT

FIRST REPORT

This is not an official publication of the House of Commons or the House of Lords. It has not been approved by either House or its committees. All-Party Parliamentary Groups are informal groups of Members of both Houses with a common interest in particular issues. The views expressed in this report are those of the group.

We thank the many varied organisations who have come together and recognised the importance of addressing the impacts of microfibres on the environment.

We recognise that with such a wide-ranging report it has not been possible to reflect exactly the views of all participants but we welcome the commitment all members have shown to developing practical solutions to this huge problem.

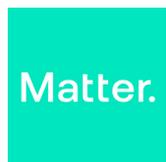


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Foreword



“I want to thank the National Federation of Women’s Institutes for first alerting me to their excellent campaign ‘End Plastic Soup’ in 2017. It was through their campaign that they brought to the attention of MPs the problem with plastic microfibres. Microplastic pollution is a growing problem, with plastic microfibres playing a large part in this. These small pieces of plastic shed from our clothes into the air and they also work their way into our waterways through the domestic and commercial washing of clothes, which has been found to have an effect on marine life. Recent evidence also suggests that microplastics have been found entering into the human food chain with potential negative health effects on humans. The Government should consider implementing changes to significantly reduce and help mitigate the harmful effects humans have in disposing microplastics in our environment and specifically our marine environment.”

Alberto Costa MP, Chairman



“The Women’s Institute has been working to protect and conserve our oceans from pollution since 1927. Since the start of our ‘End Plastic Soup’ campaign in 2017 to eliminate microplastic pollution from laundry, we have written and published our ‘In a Spin’ report. Across England, Wales and the Islands, WI members have raised awareness of the problem of plastic microfibres within their own communities, and championed best practice clothes- washing behaviours. The APPG on Microplastics’ holistic recommendations aim to deliver concrete changes across the life-cycle of a garment to help clean up our environment. 2021 is a huge year for climate and environmental action in the UK, and we urge the UK Government to use our thorough policy recommendations as a solid foundation to stem the tide of plastic microfibres into Britain’s seas and waterways.”

Ann Jones, Chair of the National Federation of Women’s Institutes

Our members

Mark Pawsey MP

Liz Twist MP

Sir Oliver Heald QC MP

Kerry McCarthy MP

Douglas Chapman MP

Cherilyn Mackrory MP

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ALL-PARTY PARLIAMENTARY GROUP ON MICROPLASTICS

MICROPLASTIC POLICIES FOR THE GOVERNMENT

Introduction

The UK Parliament's All-Party Parliamentary Group on Microplastics (The Group) works to raise awareness of the effects of microplastics on the environment. The Group works together to discuss issues related to microplastics and steps needed to tackle the issue and prevent harmful impacts on the environment, riverine and marine life and human health.

In this first report, the Group has been focussing on the issue of plastic microfibres; these are plastic fibres defined as 5mm or smaller that are shed from clothing when worn and laundered.⁽¹⁾ Due to their size, they are too small to be caught by standard washing machines and can end up in the wastewater system where they are either caught or remain in sewage sludge or are released into rivers and eventually into marine environments. This potentially damages riverine and marine species and can subsequently enter into the human food chain.⁽²⁾

For this inquiry, the Group sought to understand plastic microfibre release during the laundry process – considering the scale of the problem, its impacts and possible solutions.

The Group was founded by Chairman Alberto Costa MP in September 2020. The Group's Secretariat is provided by the Women's Institute.

This document has been produced as a result of a series of stakeholder roundtables. The Group's Chairman and Secretariat invited contributions from over thirty relevant organisations between January and June 2021. These included global washing machine manufacturers; leading academics with specialist expertise in microfibre plastic release; industry and retail representatives; environmental groups working on microfibre plastic release, and those with a wider interest in rivers and ocean conservation and plastic pollution.

As the APPG on Microplastics, this report refers to the environmental harms caused by plastic microfibre release from clothing. However, the Group are clear that both natural and synthetic fibres are polluting the natural world. Concerted action is needed on all microfibre types to ensure that our seas, waterways and food chain are clear from damaging pollutants.

During the roundtables, stakeholders informed Parliamentarians of current research and what some believe to be the main issues surrounding microplastics. During the meetings, potential policy solutions to mitigate against pollution were discussed.

The Group also received written submissions from relevant stakeholders on feasible, holistic policy proposals that if implemented by the Government could significantly reduce microfibre plastic released into our environment.

EXECUTIVE SUMMARY OF RECOMMENDATIONS

Education and Awareness

1. Emphasise the role of education and awareness of microplastics.
 - a) The UK Government to coordinate targeted public behaviour awareness communication campaigns on the environmental impacts of plastic microfibre release from the laundry and wastewater treatment cycle.
 - b) The UK Government to work with curriculum leads, academia, citizen science facilitators and on-the-ground educators to provide teachers and educational professionals with researched and evidenced 'microplastic action packs' for use in schools and youth groups. This is in order for young people to be aware of the problem and the steps they can take to mitigate their own impact.
2. Appoint a designated 'Minister for Plastics Pollution' (MOPP): a new cross-departmental Minister with a clear remit for the control and prevention of plastic pollution, as well as oversight of environmental policies that concern plastics and their polluting effects on the land and aquatic environments.

Textiles

3. Introduce an Extended Producer Responsibility scheme for textiles from 2023.

Filtration and Wastewater

4. Introduce legislation and standards which require microfibre filters to be fitted into all new domestic and commercial washing machines from 2025.
5. Creation of UK microfibre recycling technology.
 - a) Incentivise the establishment of recycling technology for microfibres with funding through Innovate UK to enable UK businesses to deliver viable microfibre recycling solutions at scale.
 - b) Washing machine manufacturers and/or filter manufacturers are mandated to communicate how microfibre waste should be correctly recycled or disposed.
6. Create an Environmental Quality Standard for plastics.

WHY NOW

The Environment Bill

Following the UK's departure from the European Union, there remain legislative opportunities for the UK Government to legally enshrine world-leading environmental targets designed to protect and preserve our environment for generations to come.

One of these opportunities was the recent Environment Bill.

The Environment Bill has been designed to set out a framework by which ministers can put in place new targets on vital issues like air pollution, water quality, waste and resource use and biodiversity.⁽³⁾

Whilst the Group welcomed the scope of the Environment Bill and the ability to set waste reduction and resource efficiency targets, the Bill does not refer to microplastics or their associated pollution.

The resource efficiency targets in the Environment Bill are also intended to be measured primarily by the energy or weight of materials used. This makes it trickier to address microplastic pollution, due to their lightweight nature and because they involve less energy use than many other materials.

It is vital that the UK Government does not miss a further opportunity to tackle the pervasive problem of microplastics.

Resources and Waste Strategy

The Resources and Waste Strategy for England sets the direction of travel for a host of future policy and legislative changes. The Resource and Waste Strategy sets out measures to uphold the so-called 'polluter pays' principle, minimum requirements on eco-design, policy measures to support re-use and closed loop recycling, and requirements to provide more product information to influence consumer behaviour.

The Resources and Waste Strategy outlines the Government's commitment to supporting voluntary industry action, in addition to the role of wider policy measures to support reuse and closed-loop recycling to reduce the environmental impacts of clothing.⁽⁴⁾

However, the Group believes that this current commitment does not offer the complete solution to the release of microfibre plastics into the UK's waterways and marine environments.

In order to take substantive action on the release of plastic microfibres, the Government needs to take a more holistic and ambitious approach across the life-cycle of a garment to limit the release of any plastic microfibres into the environment.

2018 Ban on Microbeads

The 2018 UK-wide ban on the manufacture and sale of personal care products containing microbeads was welcomed by plastic pollution and ocean conservation campaigners.⁽⁵⁾

The ban on the sale of personal care products containing microbeads signalled a broader commitment from the UK Government to help stem the tide of microplastic released into the UK's marine and land environments.

This ban stopped the selling of personal care products which contained microbeads, which were common in face scrubs, toothpaste, soaps and shower gels.⁽⁶⁾

Whilst a positive step, microbeads within personal care products only represent 2% of microplastics released into the world's oceans.⁽⁷⁾ Recent research by the University of Manchester has shown that the microbead problem has not gone away. Some of our rivers are still very heavily polluted with microbeads from the discharge of trade effluents.⁽⁸⁾ Microbeads are still used in huge quantities in blast cleaning processes. These industrial uses are not covered by the 2018 ban.⁽⁹⁾ It is clear that more needs to be done to find ways to clean up our rivers and seas to safeguard people and the planet for years to come.

Currently, it is estimated that 12.2 million tonnes of plastic enter the ocean globally every year, 0.95 million tonnes of this entering as primary microplastics.⁽¹⁰⁾ Primary microplastics are those which are intentionally produced as 5 mm or less, unlike secondary microplastics which are the result of larger items breaking down.⁽¹¹⁾ Microfibres are an example of secondary microplastics, with larger fibre strands breaking down to produce microfibres.

Models have estimated that 15-31% of all microplastics in the ocean are primary; with the laundering of textiles accounting for up to 35% of the total microplastic load in the ocean.⁽¹²⁾ This modelled contribution of fibres is likely to be a severe underestimation, as fibres accounted for 70-100% of all microplastics in deep sea sediments.⁽¹³⁾

There remains a huge opportunity for the UK to tackle pervasive microplastic pollution by working in partnership with key actors across supply chains, plastic life cycles and wastewater treatment practices to meaningfully reduce and prevent the release of microplastic pollution.

HOW DO MICROPLASTICS ENTER THE ENVIRONMENT?

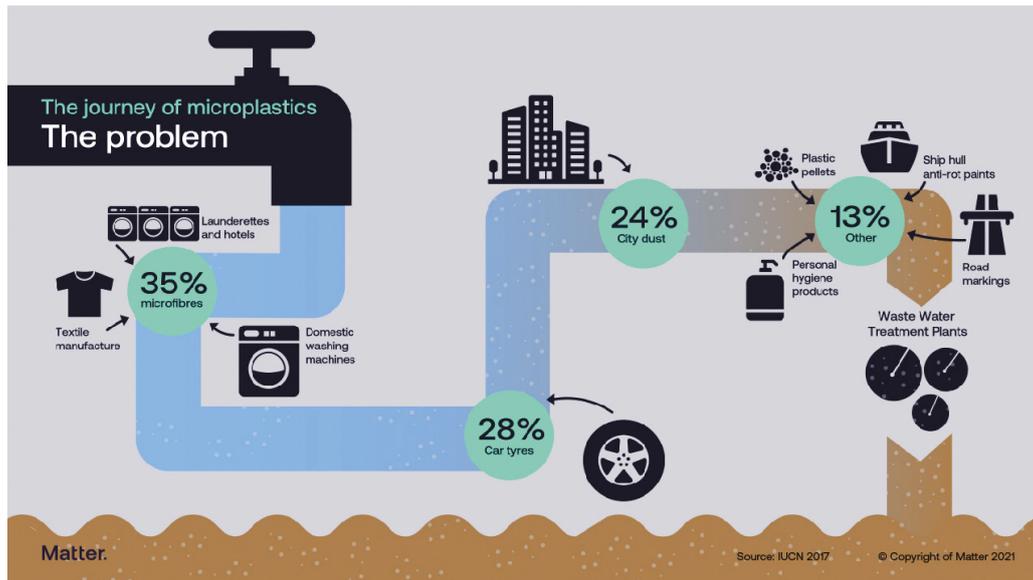


Figure 1 - This Graphic by Matter shows the journey of microplastics

Microplastics can enter the environment from a number of sources. As illustrated above, research from Matter demonstrates that 35% of total microplastics are released from clothing microfibres. This is through textile manufacture process and through the laundry cycle. When washed, clothes can shed hundreds of thousands of microfibres. These are not captured by washing machines and can pass through our water treatment system into our water environments.

Whilst microfibres from clothing are the largest overall source of microplastics, microplastics are released into the environment from a number of other sources. For example, 28% of microplastics are released from tyres and brake pads as they wear down, while a further 24% come from city dust. The city dust itself comes from a variety of different sources including the abrasion of objects such as the soles of footwear and synthetic cooking utensils and the abrasion of infrastructure like household dust and artificial turf. It also includes particles from the blasting of abrasives, weathering of plastic materials and the use of detergents.⁽¹⁴⁾ It has also been found that 13% of microplastics come from other sources including road markings, marine coatings, personal care products and plastic pellets.⁽¹⁵⁾

Microplastics can enter the environment through a number of different routes. This includes direct littering and later plastic fragmentation; wastewater effluent; surface runoff into soils, lakes and rivers; transportation by wind; and through maritime activities, i.e fishing and shipping, caused by lost fishing gear, cargo and other litter.⁽¹⁶⁾

Microplastics can also enter the environment through sewage sludge. Sewage sludge is a by-product of the wastewater treatment process, with the treatment itself generating sludge, a semi-solid material. In the UK, a large majority of treated sludge is applied to agricultural land.⁽¹⁷⁾ Whilst this sewage sludge acts as a source of nitrogen and phosphorous and can act as a soil conditioner, the sludge also contains known contaminants, amongst these are microplastics.⁽¹⁸⁾ Treated sludge is estimated to contain 69%-80% of the microplastics which enter through the wastewater treatment works.⁽¹⁹⁾

Marine Life and the Environment

Microfibres and microplastics have been discovered by researchers everywhere they look including in the air, soil, rivers and deepest oceans around the world. Lusher et al (2013) found that out of 504 fish examined from the English Channel, over one third of fish had ingested plastic. This included commercially important species.⁽²⁰⁾ The ingestion of microplastics by organisms shows that it negatively impacts feeding behaviour, growth, development, reproduction and lifespan.⁽²¹⁾ Ingestion of microplastics by aquatic fauna also takes place in our rivers and lakes.⁽²²⁾

Natural and semi-synthetic fibres will also pose environmental concerns due to the chemicals associated with them.⁽²³⁾

Plastic microfibre pollution has also been discovered in snow close to the peak of Mount Everest. The highest concentration of plastic microfibre pollution was found around Everest Base Camp, where climbers and trekkers spend most of their time.⁽²⁴⁾ The fibres were most likely to have come from the clothing, tents and ropes used by mountaineers.⁽²⁵⁾ Other recent discoveries of plastic microfibre pollution in remote parts of the Swiss Alps and French Pyrenees indicate the particles can also be carried by wind further afield.⁽²⁶⁾

Recent research by Professor Jamie Woodward and others at The University of Manchester has shown that many urban and semi-urban river beds in the UK are heavily contaminated with microplastics.⁽²⁷⁾

Researchers also found plastic pollution in the depths of the Mariana Trench in the Western Pacific ocean, near Challenger Deep, which is the lowest place on the face of the planet. They found the highest levels of microplastics yet found in the open ocean.⁽²⁸⁾

Potential effect on human health

The prevalence of microplastics in our environment has caused concern about the possible impacts on human health. The size and shape of plastic microfibres means that they are easily ingested by aquatic fauna, and could therefore end up in the human food chain. There is a real need for more research into the possible impacts of ingestion of microplastics on humans.

Concerns have also been raised about the impact of breathing in airborne microfibres. In 2021, van Dijk et al isolated lung cells by putting them in a petri dish and growing them into 'mini-lungs' - tissue that replicates much of the complexity of lungs. The research team found that these 'mini-lungs' reacted strongly to nylon fibres, and stopped forming new 'mini-lung' cells.⁽²⁹⁾

Findings from this study are also evidenced in real-life examples amongst textile workers, with Lai and Christiani (2013) demonstrating that organic dust exposure in the textile industry can lead to obstructive lung disease that has features of both asthma and chronic obstructive pulmonary disease.⁽³⁰⁾ Researchers also found that dependent on the duration of the exposure to microfibres, any lung damage was reversible should a worker reduce/stop their exposure to microfibres.⁽³¹⁾

Microfibres have the potential to leach chemicals into the environment, and to pick up viruses and bacteria. Lavery (2018) found more than a dozen species of *Vibrio* bacteria holding onto microplastics, including microfibres.⁽³²⁾

As the effects of the COVID-19 health emergency have brought into sharp focus the importance of good respiratory health and the public health impacts of viruses, there is a huge opportunity for the UK Government to take action and implement strategies to prevent microfibre release into the environment and to examine the potential impacts of the presence of these fibres on human health.

Textiles

Textiles are estimated to be the largest source of synthetic fibres in our seas, with microplastics shedding into the water system every time garments are washed. Microfibres from textiles enter rivers via discharges from wastewater treatment plants, and are then transported to the ocean. Napper and Thompson (2016) found that a single 6kg domestic wash has the potential to release as many as 700,000 fibres.⁽³³⁾

Coupled with findings by the Women's Institute that UK households are doing as much as 68 million loads of laundry per week, this has the potential to have huge implications for our environment.⁽³⁴⁾ An additional robust measurement for microfibre release has recently been devised by Tiffin et al (2021).⁽³⁵⁾ Microfibres are released from all textiles, and can be comprised of both synthetic (plastic) and natural (cellulose/protein) materials.⁽³⁶⁾

A number of factors can affect the extent to which microfibres shed from clothing, including the raw materials used to create a garment; the fibre type in use; the yarn in use; the fabric in use; the colour used; the garments' finish; the clothing care practices used by the consumer, and the age or condition of the garment.⁽³⁷⁾

Increased fibre shedding is seen in particular within the fast fashion industry. The accelerated 'fast fashion' linear business model involves increased numbers of new fashion collections every year with very quick turnarounds from design to end-of-life. The short lead times mean that wash tests and wearer trials are often not feasible.

In addition to this having implications for garment quality, this can mean millions of microfibres are being released through domestic wash cycles that would otherwise have been prevented at a commercial stage.

The fast fashion industry also relies on use of virgin plastic production to enable the growth of the industry. The 2017 Ellen MacArthur Foundation report 'A New Textiles Economy: Redesigning Fashion's Future' estimates that 63% of materials used for clothing in 2015 were virgin plastic, compared to less than 3% being recycled material.⁽³⁸⁾

Of the synthetic contribution already outlined alongside natural materials above, a recent Ellen MacArthur report estimates that only 3% of these are from recycled materials.⁽³⁹⁾ Although the impact of using recycled synthetic yarns has been researched in regard to this topic, there is currently no conclusive data that can indicate if using recycled synthetic raw materials contributes or not to the loss from textiles. Further work is underway to work to clarify this.

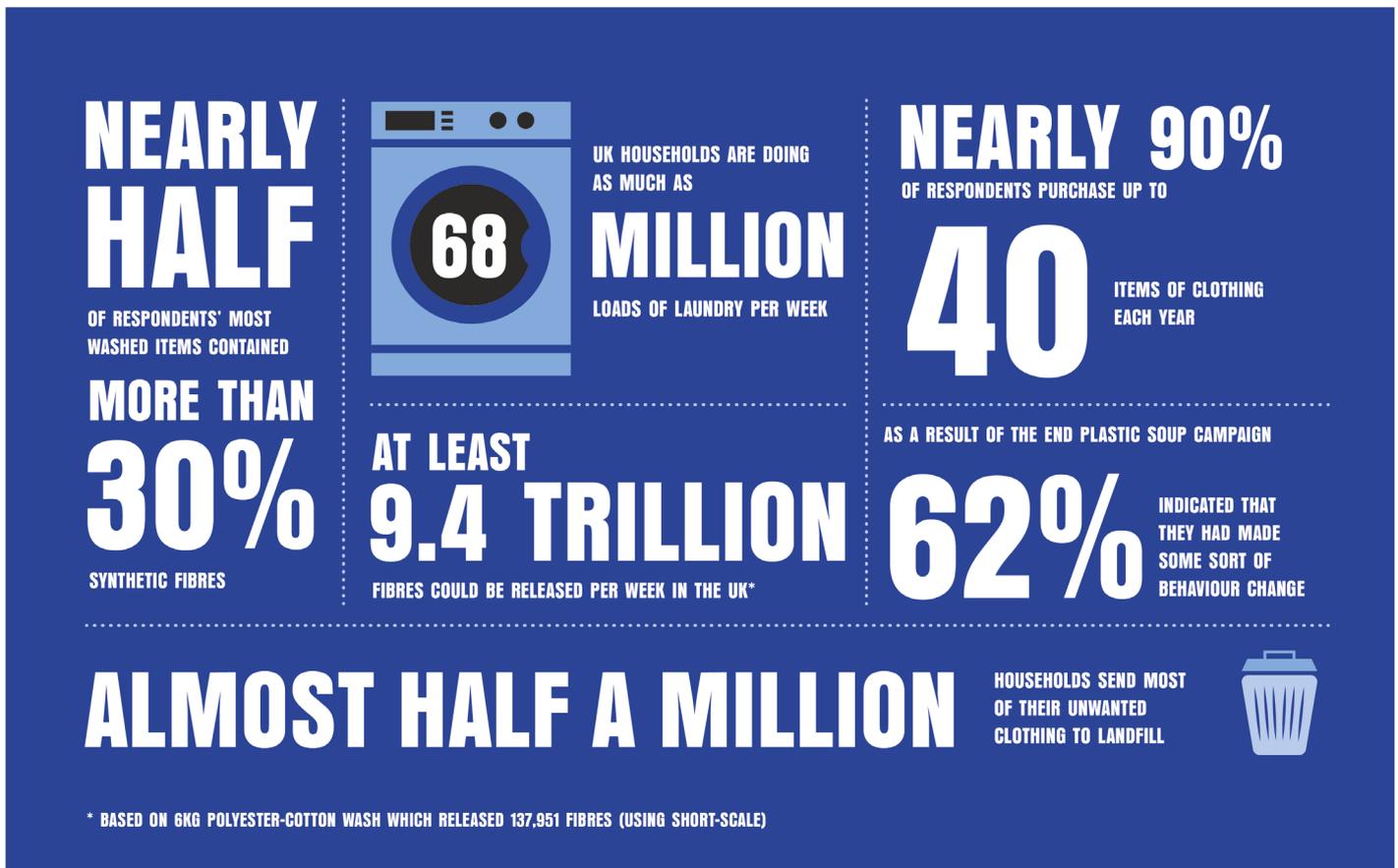


Figure 2 - Findings from the WI's 'In A Spin' report

With the growth of the UK retail market for fast fashion, the average consumer buying 60% more clothing than they did 15 years ago, and the release of at least 9.4 trillion microplastic fibres per week from laundry in the UK⁽⁴⁰⁾, there is an urgent need for Government and garment producers to work together to identify and implement strategies to mitigate microfibre plastic release as much as is feasible.

Wastewater treatment

Wastewater treatment works have been found to be very efficient in removing microplastics from final treated effluent, with removal rates of between 80 – 99%.⁽⁴¹⁾ However, this still means an estimated that 65 million microplastics particles are discharged every day in the effluent from each treatment plant.⁽⁴²⁾ Generally, there are three stages of the waste water treatment process. These are known as the primary, secondary and tertiary stage.⁽⁴³⁾ Each stage purifies the water to a higher level. The level of treatment necessary depends on the water's intended use case and what environment it will be discharged into. Not all waste water treatment plants require the tertiary stage.⁽⁴⁴⁾

Despite being captured in the process, the overwhelming majority of microplastics still end up back in the environment.⁽⁴⁵⁾

One of the ways this happens is that microplastics can be released from treatment plants through wastewater as not all particles are captured by the treatment process. Where solid materials, including microplastics, are captured by treatment processes, they remain within the final treated sewage sludge. Many plastic microfibrils are high density and therefore, likely to settle out in the sludge capture stages.⁽⁴⁶⁾

Further, solid materials, including microplastics, are captured and remain within the final treated sewage sludge. Treated sewage sludge is routinely spread on agricultural land, which although providing nutrients and organic matter, also contains the chemicals and microplastics which are captured during the treatment process.⁽⁴⁷⁾ It has been estimated that approximately 50% of microplastics that are disposed of down the drain are subsequently released to the environment and 86% of these releases are to agricultural soil via sewage sludge.⁽⁴⁸⁾ Repeated sludge applications on soil leads to the accumulation of more microplastics over time which then results in higher concentrations. Microplastics in sewage sludge applications are available for transport to an aquatic environment. The Marine Conservation Society has proposed that the UK Government introduce monitoring and research programmes from source to sea for contaminants.⁽⁴⁹⁾

What action is already underway to tackle the plastic microfibre problem?

- The Sustainable Clothing Action Plan (SCAP) 2020 commitment co-ordinated by the Waste & Resources Action Programme (WRAP) brought together 85 clothing retailers in a collaborative effort to reduce the environmental footprint of the clothing industry.⁽⁵⁰⁾ However, the SCAP 2020 plan did not include an action point for mitigating and researching microfibre plastic release.
- Whilst the follow-up plan, the Textiles 2030 Action Plan, makes a commitment to use improved and recycled fibres, and asks its signatories to move towards a circular product life cycle, the Plan still does not make reference to fibre release. WRAP has also faced funding cuts, which could hamper the efficacy of the Textiles 2030 Action Plan.⁽⁵¹⁾
- The Microfibre Consortium (TMC) facilitates the development of practical solutions for the textile industry to minimise microfibre release into the environment from textile manufacturing and product life cycle. To date, the work carried out by TMC has included the development of a standardised test method, and research regarding shedding behaviours of various production parameters.⁽⁵²⁾

- A Cross Industry Agreement, endorsed by the European Commission, was created in January 2018 and includes the European Textile and Apparel Confederation, the International Association for Soaps, Detergents and Maintenance Products, the European Outdoor Group, the European Man-Made Fibres Association and the Federation of European Sporting Goods Industry. These industry stakeholders have agreed to work together to combat the release of microfibre plastic into the marine environment in order to contribute to the development of an international standardised test method to identify and quantify microfibres present in water and the environment.⁽⁵³⁾
- The Environmental Audit Committee has recommended the publication of a comprehensive strategy for researching and mitigating sources of microplastic pollution, particularly in relation to synthetic fibres.⁽⁵⁴⁾
- Thames Water is one of the water companies participating in UK Water Industry Research (UKWIR) 'Sink to River- River to Tap' research that is using a sampling and analysis methodology developed by the UK Centre for Ecology and Hydrology in order for the water industry to better understand how much microplastic is present in its wastewater treatment works and its sludge. The research aims to work out how best to quantify the amounts which will enable a direct comparison of wastewater treatment.⁽⁵⁵⁾
- In 2019, Arcelik, the parent company of Beko and Grundig, announced that the world's first washing machine with a microfibre plastic filter will be available for purchase in 2021. The filter will block 90% of microfibres from entering the wastewater system.⁽⁵⁶⁾
- In 2021 Xeros Technologies signed an agreement with the commercial laundry company Girbau to license the company's microfibre filtration technology XFiltra. The Girbau-XFiltra products have a microfibre capture rate in excess of 90% of all microfibres and are self-cleaning devices.⁽⁵⁷⁾

RECOMMENDATIONS FOR ACTION

The multiple point sources of microfibre plastic release into the environment from clothing requires a robust cross-sector approach from all stakeholders across the life-cycle of a microfibre. This includes, but is not limited to, designers and manufacturers of clothing, retailers, washing machine manufacturers, consumers and wastewater treatment plants.

Successfully addressing the issue will also require action from the Government through legislation and policy development. A number of countries around the world have already taken such steps, such as France and Australia. France has pledged that all new washing machines are to be fitted with a microfibre filter by 2025.⁽⁵⁸⁾ Australia is also working with industry to fit filters in washing machines by 2030.⁽⁵⁹⁾

The use of microfibre filters in washing machines would help stem the release of plastic microfibres into our rivers and marine environments. This would also help create consumer awareness around the harms of microplastics in the environment. However, reducing microplastic pollution must be approached holistically with a number of different policies which, when implemented together, would positively contribute to reducing microplastic pollution in the UK.

These actions must span the whole lifecycle of a microplastic fibre – including textile construction, design, use and disposal – not just the washing process.

To revolutionise our approach to microplastic pollution in the UK, fresh ideas are needed across the three broad themes of education and awareness, textiles and filtration and wastewater treatment. This will include building on the existing legal framework; ensuring that there are standards in place for the correct disposal of microplastics and microfibres; and introducing new initiatives at every level of Government which educate and incentivise the reduction of microplastic pollution.

As an island nation, the UK has a strong responsibility to protect and conserve our seas. With upcoming global environmental leadership opportunities for the UK, strong legislative action on microfibres could help to set the tone for robust and ambitious agreements at COP26.

POLICY RECOMMENDATIONS

Education and Awareness

Introduce new initiatives at every level of government which educate about the effects of microplastic pollution as part of wider environmental awareness and create clear incentives for protecting the environment from plastic.

1) Emphasise the role of education and public awareness

Work with educational and cultural institutions to achieve widespread public awareness of the issue of microplastic pollution.

Problem

Whilst every point in this report requires government action, such action will only provide part of the solution to marine and environmental protection until there is widespread public awareness of the issue, and acknowledgement that it must be dealt with as a matter of urgency. This includes awareness all the way across the supply chain, including a focus on raising awareness amongst manufacturers and retailers in addition to public behaviour campaigns.

Policy Response

a) The UK Government to co-ordinate targeted public behaviour awareness communication campaigns on the environmental impacts of plastic microfibre release from the laundry and wastewater treatment cycle.

These public behaviour awareness campaigns should aim to raise awareness of plastic microfibre release throughout the supply chain of a garment, from its creation to the end of its lifecycle, and should encourage interim best practice measures on the care of a garment until longer-term measures can be implemented. The public behaviour campaign could also include purchasing habits, drawing attention to the scale of clothing bought in the UK, and tips for garment care.

Any best practice communications campaign should be delivered in consultation with environmental organisations already working on this issue, and with partners across the lifecycle of a garment.

b) The UK Government to work with curriculum leads, academia, citizen science facilitators and on-the-ground educators to provide teachers and educational professionals with researched and evidenced 'microplastic action packs' for use in schools and youth groups.

This would be linked to the existing curriculum in order to make it easier to incorporate education on microplastics into a range of lessons from KS1 to GCSE level. These microplastic action packs should also be made available to educators and educational institutions within the devolved administrations. Content within the microplastic action packs should balance the environmental effects of microplastics, and practical ways to reduce microplastic emissions into the environment.

2) Appoint a designated ‘Minister of Plastics Pollution’ (MOPP)

Appoint a Minister of Plastics Pollution, with a clear remit for the control and prevention of plastic pollution.

Problem

Plastic pollution is a serious and complex issue and is responsible for harm to wildlife and ecosystems at all scales from local to global level. There is increasing evidence that it also poses a risk to human health, which will become increasingly serious as emissions continue to rise. There are many sources of plastic pollution, with impacts varying greatly with more still to learn. Solutions to microplastic pollution will evolve over time, with some ready to be implemented today, and others needing further years of research.

Policy Response

In response to this, it is recommended that a new cross-departmental Minister should be given a clear remit for the control and overall prevention of plastic waste.

The Minister would be tasked with working across Government to set an overarching policy on tackling plastic pollution with the aim to reduce all forms of plastic pollution, and would place a duty on all public bodies and Government departments to reduce plastic pollution annually as part of the UK Government’s wider environmental action strategy.

The Minister would also have responsibility for the creation of a Microplastic Action Plan (MAP). This would set out an overall strategy for Government to help tackle microplastic release into the environment from all sources, including plastic microfibre release from garments and the washing cycle, and outline key steps to achieve a substantial reduction of plastic microfibre release into the environment.

The publication of a comprehensive strategy for the research and mitigation of sources of microplastic pollution, particularly in relation to synthetic fibres, has also been recommended by the Environmental Audit Select Committee.⁽⁶⁰⁾

This would be in addition to the measures outlined in the Environment Bill, and the Minister could work alongside the newly-established Office for Environmental Protection.

Textiles

Microfibre pollution comes from the shedding of textiles, tackling the issue at source would have long term environmental benefits.

3) Extended Producer Responsibility for Textiles from 2023

Introduce Extended Producer Responsibility (EPR) for textiles from 2023: work with the textiles industry and carry out a consultation on how best to introduce an EPR system.

Problem

One of the main sources of microfibre plastic pollution originates from the shedding of textiles.

All fabrics and fibres shed, whether natural or synthetic. A number of factors can affect the extent to which microfibres shed from clothing, including the raw materials used to create a garment, the fibre type used, the fibre used, the colour used, the garments' finish, the clothing care practices used by the consumer, and the age or condition of a garment.

Increased fibre shedding is seen in particular within the fast fashion industry due to the often lower quality of the garment. This can mean millions of microfibres are being released through domestic wash cycles rather than prevented through changes made at the commercial stage.

Textile production contributes more emissions to the climate emergency than international aviation and shipping combined. A study from CIE-MAP and Green Alliance (2018) demonstrated that an increased reuse of textiles and carpets, and a one-year increase in clothing lifespan would result in UK greenhouse gas emission savings of up to 1.8 million tonnes of carbon dioxide equivalent and 2.2 million tonnes of carbon dioxide equivalent respectively between 2023 and 2032.⁽⁶¹⁾

In real terms, enough resources would be saved to fill 800,000 Olympic sized swimming pools... the equivalent waste savings of nearly four blue whales.

Emerging research has demonstrated that simply wearing clothing can release microfibres and microplastics into the environment. A 2020 study by the University of Plymouth found that simply wearing clothing could release microfibres into the environment, even more so than washing them.⁽⁶²⁾

It is clear that a long-term holistic shake-up of the fast fashion industry would be beneficial in order to tackle the problem of microfibre plastic pollution at source. The UK Government needs to work with stakeholders at all levels of the UK fashion industry as well as encouraging best practice in other parts of the world to design sustainable, feasible and long-term answers that work for all stakeholders across clothing supply chains.

With the growth of the UK retail market for fast fashion and the average consumer buying 60% more clothing than they did 15 years ago⁽⁶³⁾, there is an urgent need for Government and garment producers to work together to identify and implement interim measures to mitigate plastic microfibre release as much as is feasible.

Policy Response

In addition to Government consultations on proposals for reforming existing Producer Responsibility Schemes applying to electricals, vehicles, packaging and batteries in 2021, DEFRA has also indicated that it will consult on measures for five additional waste streams by 2025, including two by 2022.⁽⁶⁴⁾

Whilst we await the findings from the DEFRA consultation on Extended Producer Responsibility schemes for textiles, the Group would like to encourage the UK Government to work with garment producers, manufacturers and fashion and clothing brands, consumer groups, and other appropriate stakeholders to design a feasible EPR scheme that would work for all stakeholders across the life-cycle of a garment.

The Group is aware that in order for such an EPR scheme to be implemented, further research and cross industry adoption of baseline testing methods such as the developed The Microfibre Consortium (TMC) method '*Quantification of fibre release from fabrics during domestic laundering 2019*' should be adopted.⁽⁶⁵⁾

The method devised by TMC has been adopted by its members since 2018, and also used by third party laboratories.

The Group would welcome the introduction of an EPR scheme for textiles from 2023, a year following the DEFRA Extended Producer Responsibility consultation on textiles. For maximum efficacy, the Group is calling for an EPR scheme for textiles to be designed in such a way that would incentivise manufacturing best practice to create longer-lasting garments and the use of sustainable textiles and fabrics in order to produce garments with reduced microfibre plastic shedding rates.

The Group would like to call for an EPR scheme that is independently and transparently monitored and assessed.

As mentioned above, the Group is aware of the work conducted by TMC to create an industry test method and open source data on the rates of microfibre shedding from clothing to inform the material choices of clothing designers and manufacturers.⁽⁶⁶⁾ It is clear that the use of this open source data on microfibre shedding rates would be useful for use by clothing manufacturers and designers to get ready for an extended producer responsibility scheme from 2023. However, this work cannot be open-sourced without the required funds to do so.

We are therefore calling on the UK Government to fund the dissemination of key findings from TMC's Fibre Fragmentation Data Portal to facilitate further industry action on plastic microfibres.

We support the Environmental Audit Committee's call for a 1p levy per garment at the point of retail in order to fund £35 million a year for better clothing recycling and collection, and encourage further investment in domestic recycling and reprocessing⁽⁶⁷⁾. The Group is also supportive of this becoming 1% for larger retailers.

We encourage the UK Government and clothing retailers to encourage 'best practice' clothing care measures for consumers.

Filtration and Wastewater

Introducing measures focussing on filtration and wastewater would help to mitigate the amount of microplastics released into our rivers and oceans. The existing legal framework regulating plastic pollution is derived from statute and therefore can only be amended by Parliament. New legislation is therefore likely to be necessary to truly protect the UK Environment.

4) Introduce legislation and standards which require microfibre filters to be fitted into all new domestic and commercial washing machines from 2025

The UK should introduce legislation which would also outline standards to ensure all washing machines are fitted with microfibre catching filters.

Problem

Our clothes are made up of many different types of tiny fibres, including plastic fibres.

With every wash and even by wearing clothes, these microfibres shed and can end up in our environment. It has been found that a single wash can release up to 700,000 microfibres into wastewater and many of which can end up in the ocean and UK households are doing as much as 68 million loads of laundry per week.^{(68), (69)}

Washing clothes accounts for 35% of all secondary microplastics found in the environment. With an estimated 9.4 trillion fibres released from washes every week in the UK, billions of them subsequently end up in our rivers and in the ocean, and on our beaches.⁽⁷⁰⁾

Despite this, washing machines are not currently provided with microfibre filters as standard. Whilst we are seeing voluntary action from a selection of washing machine companies, faster and unified action is needed to help mitigate the worst effects of microfibre plastic pollution on our rivers, seas and waterways.

Policy Response

Introduce legislation which requires all new domestic and commercial washing machines to have a filter installed from 2025.

This would significantly reduce the amount of plastic microfibres which end up in our rivers and oceans. Introducing microfibre filters within washing machines would also empower the consumer to take appropriate action on microfibres within their home.

The Government should work with industry to introduce a standard filter that could be fitted either inside or on the outside of a machine, with a standard or instruction on how best to dispose of the microfibres from the machines.

The Group understands that ahead of the introduction of microfibre filters within washing machines, domestic appliance manufacturers would require agreed minimum technical and efficacy requirements for the performance of the washing machine filters.

In a domestic context, the setting of these standards could be determined through conversations between DEFRA, washing machine original equipment manufacturers, washing machine filters manufacturers, and with other relevant third sector stakeholders. It is suggested that taking submissions to an oral or written consultation would help to set these standards.

The Group is mindful that due to the international nature of domestic appliance markets, any standards devised in a UK domestic context would also need to be achievable and applicable on a pan-European level. In this instance, the Group urge the UK Government to ensure any standards are set in consultation with pan-European organisations and governments. These standards should seek to deliver, amongst other standards, an international agreement on the size of a microfibre, and should assess any negative unintended consequences for the environment and to the consumer.

Although we understand the standard-setting process is likely to take a minimum of between three to four years, and therefore represents a challenge of reaching the 2025 target, we believe this is an important and necessary step to take ahead of the roll-out of mandatory microfibre filters within washing machines, and would encourage Government and industry to collaborate on this as quickly as possible to ensure any delay beyond 2025 is minimised.

The Group would like to emphasise that any legislation in this area should be mindful of any future technological developments to combat microfibre emission release, and should not seek to constrain the implementation of these technological developments.

This legislation in the UK would be a very significant step to protect the UK environment and further build upon existing law changes.

5) Creation of UK microfibre recycling technology

This will include waste produced during the lifecycle of a domestic and commercial washing machine.

Problem

The collection of microfibres in domestic and commercial washing machines by in-machine or external washing machine filters has the potential to significantly reduce microfibre release into the environment.

However, the incorrect disposal of collected microfibres can still lead to microfibres entering wastewater systems through household toilets, sinks or through landfill.

Current solutions to this problem are incomplete.

Some original equipment manufacturers leading action on mitigating the release of microplastic fibre release into the environment from the laundry cycle are using a returnable microfibre cartridge filter system. This may be a good interim solution whilst the national microfibre waste infrastructure does not exist, but emptying of the microfibre cartridges is often reliant on a paid, subscription model. Over the lifespan of the average washing machine, this is likely to incur significant costs to the consumer.

Another potential solution to the problem of microfibre disposal is incineration or burning the fibres. Whilst strict environmental controls are in place at environmental facilities, this should not be a long-term solution.

There is a clear opportunity for Government and industry to work together to find a viable, long-term microfibre recycling solution at scale.

Policy Response

a) Incentivise the establishment of recycling technology for microfibres with funding through Innovate UK to enable UK businesses to deliver viable microfibre recycling solutions at scale.

Whilst this would be a complex problem to solve, the Group believes that in order to provide sustainable, long-term solutions to microfibre waste collected from the laundry process, dedicated microfibre recycling solutions would have to be devised at scale.

Any washing machine filter efficient enough to capture microfibres at an acceptably high level is likely to capture natural and synthetic microfibres, in addition to dirt, dust, oils, food particles, undissolved washing powders and in some cases, human waste.

Due to this array of heterogeneous materials captured by microfibre laundry filters, collected microfibre waste is currently very difficult to recycle.

The Group would urge the Government to incentivise innovation in this area by providing interested businesses with allocated funding through the UK's Innovation Agency, Innovate UK, to devise ways for microfibre waste to be separated and recycled at scale.

b) Washing machine manufacturers and/or filter manufacturers are mandated to communicate how microfibre waste should be correctly recycled or disposed.

As a complementary, interim proposal during the long-term goal of devising and creating a dedicated recycling stream for microfibres, the Group would call on washing machine manufacturers and washing machine filter manufacturers to include in consumer communications the best ways for them to correctly recycle or dispose of their collected microfibre waste from the laundry cycle.

6) Create an Environmental Quality Standard for plastics

Introduce an Environmental Quality Standard for Plastic to allow the Environment Agency to set plastic emissions limits into waterways.

Problem

Whilst wastewater treatment plants have a high microfibre capture rate of up to 99%⁽⁷¹⁾, very large quantities of microplastics continue to be discharged into the environment. This is particularly the case during periods of dry weather, where wastewater is released into river flows that are too sluggish to disperse microplastics downstream⁽⁷²⁾. Even treated wastewater transports very large quantities of microplastics because the volumes of wastewater are so high.

Microplastics can settle into the UK's river beds and remain present on the river bed for weeks or months before they are flushed away by flooding. These microplastics can be ingested from the river bed by aquatic creatures.⁽⁷³⁾

As plastic is a pollutant, it can be subject to control by Water Discharge Activity permits which are issued by the Environment Agency.⁽⁷⁴⁾ However, there is currently no Environmental Quality Standard (EQS) for plastics, nor is microplastic mentioned within the Water Quality Directive.⁽⁷⁵⁾

EQS are legally binding limits from concentrations of individual substances, and can help limit significant risks to the environment. The lack of an EQS for plastic or microplastic release into the environment is already causing ecological damage to UK river beds, especially in urbanised areas.

In addition, while the Environment Agency grants permits to allow the discharge of untreated wastewater into rivers via storm overflows after heavy rainfall in exceptional circumstances, research from The University of Manchester demonstrates that water companies routinely breach this condition.⁽⁷⁶⁾

In 2021, the Environment Agency highlighted that water companies discharged raw sewage into rivers and coastal waters in England more than 400,000 times in 2020 for a total of 3.1 million hours.⁽⁷⁷⁾ Despite this, the Environment Agency only reported 160 breaches of permit.⁽⁷⁸⁾

In evidence to the Environmental Audit Committee, Professor Peter Hammond suggested that there could be ten times more permit breaches than currently identified by the Environment Agency.⁽⁷⁹⁾

Without these unlawful sewage discharges, the microplastic hotspots on river beds would occur much less frequently.⁽⁸⁰⁾ The problem is particularly acute in urbanised areas, which demonstrate that the UK's microplastic concentrations are the highest recorded anywhere in the world.

Recent Environment Agency data demonstrates that every single river in England failed to meet safe chemical standards, with 86% not in good ecological condition.⁽⁸¹⁾

Policy Response

As no such standard yet exists, it is clear that preparatory work would need to be undertaken ahead of the setting of the EQS.

To set a realistic EQS, baseline or initial monitoring of rivers and waterways across the UK needs to occur to further understand sources of plastic microfibrils. The Group acknowledges that the baseline monitoring of microplastic release could also be done by using end-of-pipe assessments of microplastic release. Further, the Group would recommend the monitoring of plastics in sewage sludge as part of the baseline monitoring with the need of an introduction of thresholds moving forward.

As Water Discharge Activity permits are issued by the Environment Agency, it is suggested that the Environment Agency could have overall responsibility for the measurement and ongoing monitoring of microplastic release into the country's rivers and waterways. Day-to-day monitoring and assessment of microplastic release could be administered by another relevant Government body as the Environment Agency's capacity and resources allow.

We also support The University of Manchester's request to lead a UK-wide survey of the microplastic burden on the UK's river beds, using the methodology outlined within their research papers.

We are calling water companies and water authorities such as Ofwat to ensure that all wastewater from treatment plants is thoroughly treated by water companies as we understand this is currently the best available means to reduce microfibre plastic release into UK rivers and our seas.

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APPG on Microplastics

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