

# Microplastic Legislation Report

Exeter iGEM 2019

We are a bioengineering research group from the University of Exeter taking part in a summer research project for the international iGEM (International Genetically Engineered Machine) synthetic biology competition. iGEM encourages multidisciplinary teams from across the world to collaborate and innovate to solve some of the world's biggest challenges. As a team we believe that the Government plays a huge role in facilitating the innovation that leads to complex problems being solved, so we are hoping to encourage you to put systems in place that would influence this.

This year the team have been looking to tackle the problem of microplastic pollution in our oceans. Our aim is to develop an enzyme-based microplastic filter that can be integrated into washing machines to trap and degrade plastic fibres that have been released from synthetic clothing during a washing cycle. Microplastic pollution, 35% of which originates from the washing of synthetic fibres, is an issue at the forefront of environmental conservation and protection. It is predicted that 700,000 fibres are released in a single wash. Both our food sources and a predicted 80% of drinking water contain microplastics, which are now making their way into the human body. The effects of this are as yet unknown, but are predicted to play a huge role in the future of medicine.

As part of our research we have been in contact with various stakeholders and academics, including washing machine companies, high quality fashion brands and research groups. In meetings we have held, we have been met with resistance regarding the integration of a microplastics filter into washing machines. As microplastics become a greater problem for our society and our planet, we need to innovate solutions to solve this problem and prevent it from escalating further. However, if these solutions cannot be implemented where they are needed most, the likelihood of this generation solving the microplastics problem is greatly decreased.

With the Government having declared a climate emergency, we believe that tackling microplastics pollution greatly supports this declaration. Microplastic pollution damages our ecosystems, our marine life and potentially in the future, human health. Therefore, action on this type of pollution needs to be prioritised. We believe that legislation and support from the government could significantly influence environmental change, especially within the area of microplastic pollution. Enforcing the self-regulation of washing machine companies to include microplastics filters within their machines could make a substantial difference to solving the microplastics problem. After consulting washing machine manufacturers and clothing brands, we have found that the main barrier to companies integrating this filter is the economic cost. To encourage companies to comply with potential self-regulation targets set by the Government, incentives such as tax breaks or subsidising the initial cost of the integrating filters into the machines could be employed. This would make it more economically feasible for companies to integrate the filters directly into their machines and would result in the reduction of microplastics being released into the water system.