

Microplastics

Why and when are they a problem?

- Microplastics can be found wherever we choose to look, from remote Arctic locations to marine organisms and in the air we breathe.
- So far, there is no body of evidence that clearly demonstrates there is a negative effect on human health or the environment. However, microplastics continue to be generated, are persistent in the environment and research is ongoing as to their impact.
- It is a widely shared view that allowing plastic waste to build up in the environment will have consequences. However, the use of plastic is interconnected with other sustainability issues where plastic may be helping – using plastic film in agriculture can minimise pesticide use, plastic packaging can reduce food waste, so an holistic approach is required.
- While waiting for evidence to be gathered and understood, there are actions that can be taken, such as reducing the use of plastic and using replacements where it makes sense, and taking more concrete steps towards enabling a circular economy for plastics.



What is a microplastic?

A particle or fibre less than 5mm in size made of 'plastic' is defined as a microplastic

However microplastics are not a uniform category of materials, there is variation in:

- ✓ **Polymer type**
Plastic is not a well defined term so microplastics can cover a wide range of materials
- ✓ **Size**
From 5mm microplastics that are clearly visible to the naked eye down to tiny nanoplastics
- ✓ **Shape**
Microplastic particles can be round or jagged or even contain holes in. Microplastics can also be found as long thin fibres

It is therefore difficult to generalise their behaviour and we don't know if any particular types are worse than others.



Biodegradable polymers are often suggested as part of the solution but it is important to note that these polymers can still form microplastics depending on the speed and conditions under which they biodegrade

Microplastics are likely to become a bigger issue



Microplastics are on the radar of a wide range of sectors: food and beverage, personal/home care, agriculture, speciality chemicals, packaging, home storage, automotive, textiles, waste water etc.



The current emphasis of regulation is on intentionally added microplastics, not those that are generated in use or present by accident, but as this is scrutinised where will it go next?



Microplastics risk becoming a significant issue for many sectors. Tracking and assessing new research on their impact as it comes out will be important.



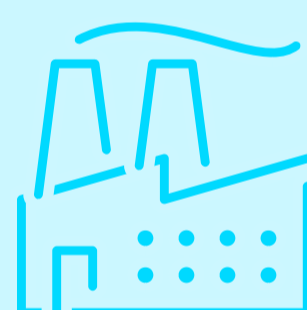
Mismanaged plastic waste is a major source of microplastics and is a pressing issue generally. Given the ubiquity of plastic materials in our lives, what can be done?

How do we interact with microplastics and where do they come from?



Generation from plastic pollution

A considerable amount of MPs are generated from mismanaged large plastic waste that breaks down over time i.e. plastic bottles and fishing nets in the ocean, agricultural film left on fields.



Accidental inclusion

Microplastics are present in air, water, or ingredients used when a product is made and can be incorporated.



Generation through intended use

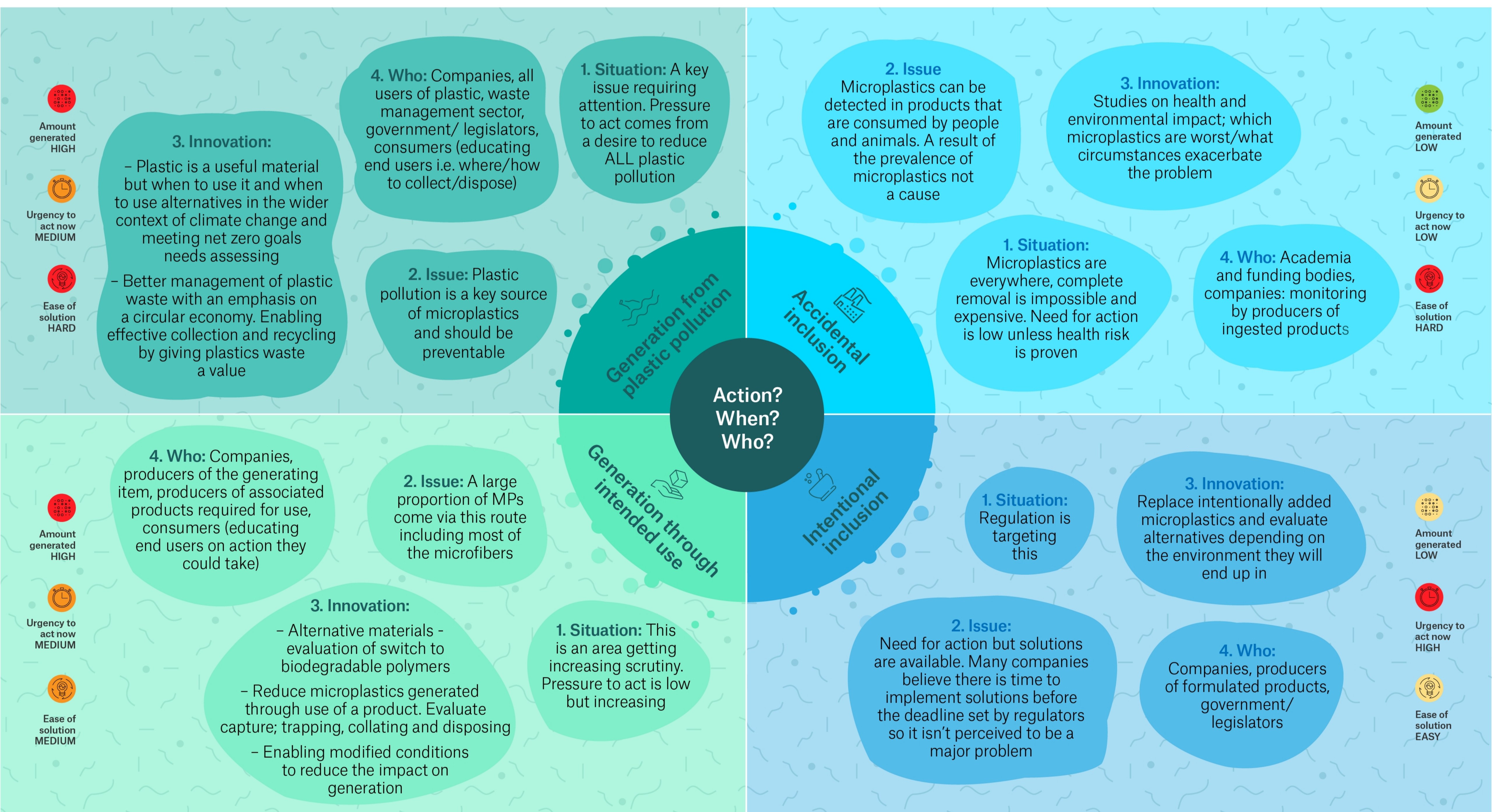
Microplastics can be generated by using products as intended i.e. car tyres degrading or machine washed textiles.



Intentional inclusion

Microplastics that perform a function i.e. microbeads in cosmetics or polymers for controlled release in formulated products.

Responsibilities and actions depend on the source of microplastics



Are you ready to act on microplastics?

Regulators and consumers are increasingly aware of microplastics. As more research is published, this awareness will grow and the level of concern will increase. Although there is currently areas that need the most attention. Removal of microplastics that are already in the environment is almost impossible, so there is a need to take a broader view and assess the use of plastic, not to eliminate the use of plastic but to tackle how and where plastic is used, and ensure it is disposed of, and used better.

Some of the approaches that could be key:

- ✓ **Enable a circular economy** for plastic to dramatically reduce mismanaged plastic waste by insuring there is value in plastic waste - without this the drive for plastic to stay in use is much reduced.
- ✓ **Consider alternatives** to single use plastic through re-use and different business models.
- ✓ **Consider the best use of plastic:** where there might be effective replacements and where not. Switching to biodegradable polymers can make sense, but they often require specific conditions for degradation to take place, which means they are not always the best solution.
- ✓ **Reformulate** and replace intentionally added microplastics.
- ✓ **Tackle the difficult problem of microplastics generation resulting from using products exactly as intended.** This can include targeted filtration strategies to remove microplastics at source as long as the collected material can then be recycled. It can also include changing conditions to reduce generation such as low temperature washing.

How we can help

- > Horizon scan for future regulation and its impact
- > Navigate the complexities of plastic use, waste and alternative materials to generate innovation strategies
- > Advise on the progression of science in terms of human health and environmental impact and consequent action needed
- > Design mitigation system such as filtration
- > Support companies response to regulation such as REACH through reformulation and assessing regulatory compliance

Visit our website for more information, we'd like to talk to you about your sustainability goals and microplastic issues: sagentiainnovation.com/consulting-sustainability/