



OPTIMISING BIORESOURCES: REDUCING WATER POLLUTION.

Reducing Chemical and Plastic Pollution of Wastewater

Executive Summary by Maya de Souza, Circular Economy Director at Business in the Community

This project highlights the threat from chemicals and microparticles to the use of biosolids - a valuable, but little-recognised bioresource - and to our water. The principles recommended will help reduce water and soil pollution, cut carbon emissions, and minimise resource costs. This will support greater economic and social well-being and increased environmental resilience.

What is the challenge?

A circular sustainable food value chain means returning nutrients and organic matter to the soil, replenishing it for future crops, and returning clean water to rivers and lakes. To date, this has involved applying biosolids - treated sewage sludge - to agricultural land and allowing treated effluent into our water bodies. This happens across the world.

There are many benefits to using biosolids. This boosts crop productivity, by maintaining soil nutrient levels and increasing water holding capacity. This reduces reliance on costly synthetic fertilisers which are highly carbon intensive, cutting carbon emissions and storing carbon at the same time. The value of biosolids is increasingly significant considering the presence of phosphates, a finite resource.

However, the increasing levels of contaminants in biosolids compromise their value for agricultural land. Contaminants include microfibres from textiles, microplastics from tyres and other products, heavy metals from vehicles, and chemicals found in household goods and pharmaceuticals. These harmful substances end up in water bodies through the discharge of effluent.

Why act?

If we don't take action to address this increasing contamination, this will impact the costs of food production as a larger proportion of synthetic fertilisers will be needed. With an expected cost of incineration in excess of £120 per tonne, the cost of water will rise as water companies will need to invest in large-scale incineration capacity. This will hurt ordinary households who already face a cost-of-living challenge. Carbon emissions will also increase.

We are at a crossroads in how we manage wastewater and sewage sludge, with a few countries shifting to the disposal of this valuable resource through incineration. The implications of the business-as-usual scenario and other scenarios are set out in the main body of the report.



To achieve these goals above, the key insight from this initiative is the importance of a clear hierarchy of actions on contaminants, based on legal and common-sense environmental principles. These include the polluter pays and preventative principles, also reflected in the waste hierarchy.

We stress the urgency of clear-sighted and long-term thinking: shifting to incineration will have high capital costs and once done can only be undone at the expense of stranded assets.

Who needs to act?

As these contaminants arise from a number of activities, a range of businesses will need to act. Relevant activities include manufacturing chemicals, manufacturing and selling products containing chemicals, and washing clothing that releases microfibres and heavy metals resulting from vehicle braking, amongst others. Other relevant players include policy-makers, regulators, buyers of products, and water treatment companies.

What should they do?

The hierarchy developed puts green chemistry principles at the top – the preferred option. We define this as the design of materials to exclude toxic substances, shifting away from manufacturing processes that produce wastes harmful to the environment, and the use of chemicals and other substances that degrade in a reasonable timeframe.

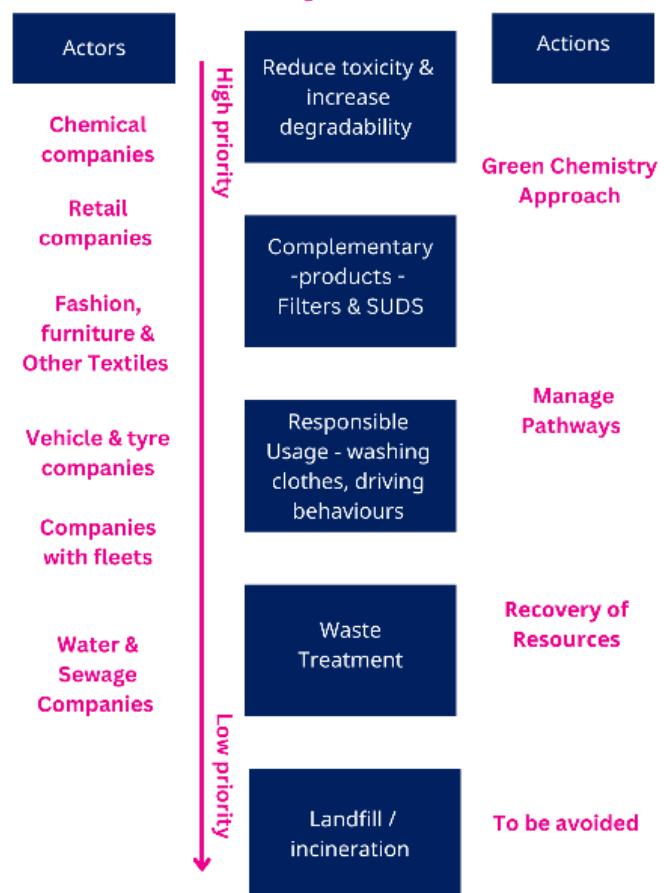
The second step is blocking routes to the water system through filters and sustainable drainage systems by highways. The third step is responsible usage by the user.

The fourth step is effective wastewater treatment that enables the recovery of problematic particles and other substances. Fine microplastics are very difficult if not impossible to recover at this stage of the cycle, and earlier action is important.

The fifth and least preferable step on the hierarchy is incineration, which should be minimised, if undertaken at all, considering the impacts of incineration on carbon emissions and soil health.

In relation to step one, upstream business innovation, for example, by the chemicals and materials industry can be supported and driven by corporate buyers and the end-user. Procurement policies enabled by clear information and labels

Hierarchy of Actions





can be effective. This is in line with corporate due diligence in relation to the supply chain.

Collaboration across the industry on collecting relevant data, understanding toxicity and transparency is important as is sharing best practice.

Further Research and Development (R&D) is also required to understand the relative toxicity of products enabling action by procurers.

It is important that policymakers consider how the costs of different processes are shared. For example, it may not be possible to stop the use of essential pharmaceuticals by finding alternatives. But action could be taken to share the costs of removal across the value chain, to create the right incentives, rather than leave it to the water companies and end users to foot the bill.

Business in the Community (BITC) members undertake activities where they sell products containing chemicals, use chemicals, or lease or own fleets that have an impact on biowastes. This is why we appeal in this report to BITC's network to act now.

Our approach

BITC's Circular Economy programme has taken a systems-thinking approach to help improve our circular system for human bioresources. This involves looking at the existing system, hearing many perspectives across different disciplines, and identifying ways to improve the system.

This meant understanding the relevant value chain, identifying the blockers, and establishing what each actor can do to achieve change, with the overall goal being to reduce pollution and achieve net zero quicker.

Accordingly, we brought companies together to explore how to protect the benefits of this circular regenerative approach and develop solutions together.

We organised a series of workshops bringing relevant players together in a safe space, informed by academics, to understand the problem and explore solutions.

How BITC can help you

- Get in touch with BITC's Circular Economy Team: [Maya de Souza](#), Circular Economy Director and [Emma Weaver](#), Campaign Officer.
- If you are not a member, [join us!](#)

