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PLASTIC POLLUTION ATTACKING THE SOURCE

Water, an essential common good, is a key concern in this era of environmental transition. Protecting water resources means implementing sustainable development based not only on a more rational use of water but also on preserving its quality. Alas, we all have images in our mind of plastic waste floating in the oceans and clogging up river banks. We know the harmful consequences of this for biodiversity and for the quality of water and are now beginning to discover the impact on health.

This is not only an environmental but also an economic issue: a 2021 report by the United Nations evaluated the impact of marine pollution linked to plastic waste at between \$6 and \$19 million.

Now that Europe is committing to a more sustainable approach to water management, we need to reconsider our practices, our policies and our technologies; given the urgency of the situation, we need to harness all the tools at our disposal.

Combating plastic pollution on land to resolve water pollution

Plastic is now estimated to represent 85% of marine waste, i.e. 75 to 199 million tonnes. Waterways, far from being spared, are affected first and are at the origin of 80% of marine pollution.

Although it may seem obvious, it is worth reiterating that 80% of marine waste comes from land-based activities.

Add to this the fact that recovering waste from aquatic environments remains technically complex and costly.

Clearly, therefore, solving the problem of water pollution means addressing the source of the problem: preventing the production of plastic waste and improving its end-of-life management.

The first action we need to take is to reduce the production of plastic waste by reducing the use of plastic. Europe has been committed to this goal for several years now with the Green Deal, which led in 2019 to the adoption of the Single Use Plastic Directive and is soon set to be reinforced by the Packaging and Packaging Waste Regulation (PPWR).

Unfortunately, however, this will not be enough: according to the OECD, around 460 million tonnes of plastics are produced each year, despite efforts made, and this figure is set to rise to 1,200 tonnes by 2060. Less than 10% of plastic waste is currently recycled. Half of the rest ends up in landfills and, what is worse, almost a quarter is not disposed of via a waste collection system at all. In 2060, despite efforts made, a billion tonnes of plastic waste will have to be managed.

After raising awareness, now is the time for solutions

In addition to reducing the use of plastic, recycling is a powerful lever that has not yet demonstrated its full potential. European technological innovations are opening the way for new solutions for increasing the possibilities for recycling. One such innovation is enzymatic biorecycling technology, developed by the French company CARBIOS. This technology recovers polyethylene terephthalate (PET) waste (one of the most widespread plastics in the world), either in the form of plastics or textiles (polyester) and reinjects it into the production cycle as a primary resource. This makes it possible to recycle packaging not currently recycled using existing technologies (coloured or opaque bottles and food containers) to a high quality, which can then be used to manufacture recycled PET products suitable for food contact and of the same quality as the original petroleum-based products.

This technology also opens the way for the fibre-to-fibre recycling of polyester textiles, for which no end-of-life solution currently exists apart from incineration or landfill. Today, less than 1% of textiles are recycled; the margins of progress offered by this polyester circularity are therefore huge.

Waste will enable us to reduce our dependence on oil

The biorecycling technology that we are developing therefore opens the way for new solutions to deal with the problem of plastic pollution in our oceans and waterways at the source. It also offers new possibilities for reducing our use of oil and European dependence. 99% of plastics are currently produced from petrol. In the future, our waste will replace this petrol as the raw material. By breaking PET down into its basic components, biorecycling means no longer relying on petrol to manufacture packaging and textiles. In addition, recent life cycle analyses¹ have shown a 57% reduction in CO₂ emissions compared with the production of virgin plastic² and 1.3 tonnes of petrol avoided for each tonne of recycled PET produced.

European regulations, an accelerating force for the environmental transition

Regulations play a key role in accelerating recycling and the use of recycled materials within the European Union. The SUP Directive established a regulatory framework aiming to reduce the impact of single-use plastics on the environment. A key aspect of this directive is the obligation for plastic bottles to contain 25% recycled plastic by 2025 and 30% by 2030, an ambitious target that reflects the European commitment to reduce plastic pollution and promote recycling. Thanks to its regulations encouraging the incorporation of recycled materials into packaging, Europe offers fertile ground for this type of technological innovation, particularly as its widespread adoption is essential if we are to achieve and possibly even surpass the goals set.

Biorecycling is not only an innovation but an industrial reality embodied in the construction in France, on the border with Belgium and Luxembourg, of a first plant capable of processing the equivalent of 2 billion bottles or 300 million t-shirts. This first CARBIOS plant is set to open in 2025. By scaling up on an industrial scale innovations developed within its borders, Europe now has the means of achieving the environmental transition goals it has set itself.

Efforts by CARBIOS and other players in the sector to change European legislation to take these innovative depolymerisation technologies into account in the calculation of recycled content demonstrate the importance of collaboration between technological innovation and the regulatory framework in order to achieve Europe's environmental goals. This synergy is crucial for ensuring that the transition to more sustainable practices is both viable and beneficial for the environment, the economy and European society as a whole.