From pollution to solution: are we there yet?

Plastic use has grown and so have the environmental concerns. Plastic can be seen everywhere in our natural environment and it is directly affecting millions of people's livelihoods, food production capabilities and social well-being. We must act now.

By *Tongai Kunorubwe*

PHOTO: SHUTTERSTOCK

The scale of global plastic pollution is significant and growing. It has gone from a de minimis quantity prior to 1950 to a staggering 60 million tons in 2020. Regrettably, less than 10% of plastic waste is ever recycled, with most plastic waste discarded or incinerated.[1] The challenge of discarded plastic waste has proven to be pervasive, with plastic debris found in the deepest part of the world's ocean including the Marina Trench,[2] and embedded in snow and water in the world's highest peaks, including on Mount Everest.[3]

A further challenge with discarded plastic is that it takes between 20-500 (not a typo) years for plastic to decompose.[4] Unfortunately, even then it does not vanish, but simply gets broken down into smaller and smaller particles. Current scientific research shows that concerningly these smaller particles are increasingly ending up in human blood, where a recent peer reviewed study showed these to be present in around 80% of people assessed[5]: in the placentas of human babies[6] and embedded in human lung tissue[7].

In parallel, plastic is a material contributor to greenhouse gases (GHG) emission and climate change. The production, conversion and waste management of plastic generates about 4% of GHG emissions. Of these, 90% can be qualified to the production and conversion stage of the plastics lifecycle.

'An estimated 300,000 whales, dolphins, and porpoises a year die from ghost nets.'

Impact on marine life

Marine plastic pollution is increasingly recognised as a significant threat to marine ecosystems, including phytoplankton, which are the foundation of the marine food web. If phytoplankton are affected by plastic pollution, it can have cascading effects through the food web, impacting the species that feed on them and the overall health of marine ecosystems.

Plastic in the ocean breaks down into microplastics, which are small plastic pieces less than 5mm long, that are swallowed by a wide range of marine organisms. They made up 88% of global plastic leakage to the environment in 2019, around 20 million metric tons, polluting all ecosystems. When phytoplankton encounter these contaminated microplastics, they can absorb these

> ‘We need to be intentional in helping crowd in capital into this mission critical area.’

toxic substances, which can affect their growth and reproduction.

An estimated 300,000 whales, dolphins, and porpoises a year die from ghost nets.[8] A recent study done by University of Exeter found that all seven species of sea turtle from the Atlantic and Pacific Oceans and the Mediterranean Sea had traces of microplastics in their gut.[9] Plastic debris is said to cause the deaths of more than a million seabirds each year.[10]

In a meta study conducted across over 100 scientifically robust studies on fish and plastic ingestion among 508 fish species, over two-thirds of these had records of plastic ingestion.[11] Explicitly, fish often mistake small plastic pieces, such as pellets, for food, with often catastrophic consequences.

Plan of action

The increasing impact from marine litter has created international concern over the effect on marine ecosystems. Whilst quite clearly much more needs to be done, as the scale of the plastic pollution challenge is increasingly understood, we have started to see some signs of global co-operation aim to tackle plastic pollution. As illustrative, in March 2022, the United Nations Environment Assembly adopted a historic resolution to develop an international, legally binding instrument with the ambition to complete negotiations by the end of 2024.[12]

Ultimately, cleaning up plastic pollution from marine environments is a costly and ongoing process. The degradation of marine ecosystems results in the loss of valuable services such as carbon sequestration, water purification, and coastal protection, which have significant economic implications. Despite the scale of the challenge, we cannot be discouraged and in fact we need to be intentional in helping crowd in capital into this mission critical area.

Latterly, we have started to see unique capital market backed solutions, where the bond market for example brings its heft towards funding resilient plastic waste collection and recycling projects, in this instance through contingent payout instruments. A recent exciting example is the World Bank’s plastic waste reduction-linked bond.

Climate change, the biodiversity challenge, and plastic pollution are among the most pressing environmental challenges of the 21st century. Addressing these issues requires systematic thinking and comprehensive joined-up strategies. Collective efforts from governments, businesses, and individuals are essential to mitigate these environmental threats. ■

Tongai Kunorubwe

Head of ESG, Fixed Income,
T. Rowe Price

1 R. Geyer, Production, use and fate of synthetic polymers in plastic waste and recycling (T. Letcher ed., Plastic Waste and Recycling (2020), pp.13-32)
2 X. Peng et al., Microplastics contaminate the deepest part of the world’s ocean (Geochemical Perspectives Letters 9-1 (2018), pp.1-5)
3 I. Napper et al., Reaching new heights in plastic pollution (One Earth 3-5 2020), pp.621-630)
4 United Nations Environmental Program
5 H. Leslie et al., Discovery and quantification of plastic particle pollution in human blood (Environment international 163 (2022), pp.107-199)
6 A. Ragusa, Plasticenta (Environment International 146 (2021), pp.106-274)
7 L. Amato-Lourenço, Presence of airborne microplastics in human lung tissue (Journal of Hazardous Materials 416 (2021), pp.124-126)
8 C. Ramp, Up in the air (Endangered Species Research 44 (2021), pp.33-44)
9 E. Duncan, Microplastic ingestion ubiquitous in marine turtles (Global change biology 25-2 (2019), pp.744-752)
10 https://www.unesco.org/en/ocean
11 M. Savoca, Plastic ingestion by marine fish is widespread and increasing (Global Change Biology 27-10 (2021), pp.2188-2199)
12 https://www.unep.org/news-and-stories/press-release/historic-day-campaign-beat-plastic-pollution-nations-commit-develop

SUMMARY

The scale of global plastic pollution is significant and growing.

Marine plastic pollution is increasingly recognised as a significant threat to marine ecosystems.

Collective efforts from governments, businesses, and individuals are essential to mitigate these environmental threats.

PHOTO: ARCHIVE T ROWE PRICE