

Turning off the Tap

How the world can end plastic pollution
and create a circular economy

Executive Summary



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Suggested citation: United Nations Environment Programme (2023). Turning off the Tap. How the world can end plastic pollution and create a circular economy. Executive Summary. Nairobi.

Production: United Nations Environment Programme

<https://www.unep.org/resources/turning-off-tap-end-plastic-pollution-create-circular-economy>

Executive Summary

In a historic decision at the fifth United Nations Environment Assembly in March 2022, all 193 UN Member States decided to end plastic pollution. With negotiations on a binding legal agreement by 2024 now underway, the question is how to realise that goal.

While many technical solutions for a circular plastics economy are known, the economic, fiscal and business models to address the associated impacts while also safeguarding livelihoods are less clear.

This report examines these issues and proposes a systems change scenario - addressing the causes of plastic pollution, rather than just the symptoms. Such a systems change will enable countries to turn off the tap and end plastic pollution while at the same time transitioning towards safer and more stable jobs for those currently working in the informal sector, and create business and job opportunities.

The report analyses the opportunities and impacts of a systems change scenario. The scenario combines reducing the most problematic and unnecessary plastic uses with a market transformation towards circularity in plastics by accelerating three key shifts - Reuse, Recycle, and Reorient and Diversify – and actions to deal with the plastic pollution legacy (Figure ES 1).

Ending Plastic Pollution

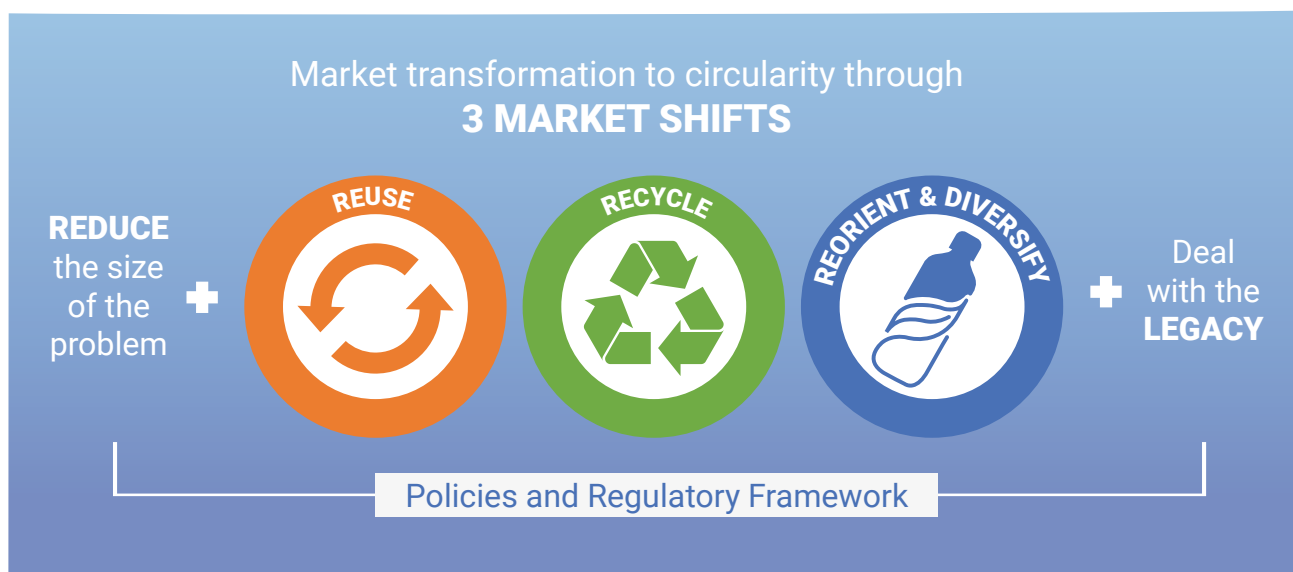


Figure ES 1: **The systems change towards a new circular plastics economy.**



Photo: Getty Images

Shift 1: Reuse

Accelerating the market for reusable products, to transform the throwaway economy to a reuse society, by creating the enabling environment to ensure the reuse market has a stronger business case than the single-use plastics market. Studies show that reuse systems provide the highest opportunity to reduce plastic pollution (a reduction of 30 per cent by 2040) by replacing some of the most problematic and unnecessary products (The Pew Charitable Trusts and Systemiq 2020).

Shift 2: Recycle

Accelerating the market for plastics recycling by ensuring recycling becomes a more stable and profitable venture could reduce the amount of plastic pollution by an additional 20 per cent by 2040 (The Pew Charitable Trusts and Systemiq 2020). This will require an adequate availability of feedstock that can be recycled and that recycled materials can compete on a level playing field with virgin materials.

Shift 3: Reorient and Diversify

Shaping the market for plastic alternatives to enable sustainable substitutions, thus avoiding replacing plastic products with alternatives that displace rather than reduce impacts. Sustainable alternatives could reduce pollution by 17 per cent by 2040 (The Pew Charitable Trusts and Systemiq 2020), but struggle to compete in markets with products made of virgin fossil fuel-based polymers owing to a number of challenges: cost of product, consumer demand and lack of appropriate regulations.

Even with the market transformation approach, a significant volume of plastics cannot be made circular in the next 10 to 20 years and will require disposal solutions to prevent pollution. This refers to collecting and responsibly disposing of plastics that cannot be reused or recycled, including plastics that are already in the environment as existing pollution, or are stocked or will enter in the economy e.g. in short-lived or durable products designed without considering their circularity or long-term use in the economy. It also refers to new ways of financing collection and disposal of legacy plastics and preventing microplastics from entering the economy and the environment.

Global plastic production and use has grown exponentially since the 1950s, with around nine million people employed globally in polymer production and plastic processing industries (United Nations Industrial Development Organization (UNIDO) Data Portal - ISIC codes 2013 and 2220). Light, strong and seemingly inexpensive plastics have permeated our lives, our societies and our economies – but at a pace that has escalated into significant costs to the environment, human health and the economy. Currently, the world produces 430 million metric tons of plastics each year (Organisation for Economic Co-operation and Development [OECD] 2022), of which over two-thirds are short-lived products which soon become waste, and a growing amount (139 million metric tons in 2021 [Minderoo 2021]) after one single use. Plastic production is set to triple by 2060 if 'business-as-usual' continues (OECD 2022).

A growing number of researchers are quantifying the social, economic and environmental costs of plastic pollution. Scientific literature is linking chemicals in plastic and

damage to human health at every stage of the plastic life cycle including workers and ‘fence-line’ communities that live next door to plastic production and waste disposal sites (Landrigan *et al.* 2023; Merkl and Charles 2022; UNEP 2021c). As well as the potential for ecosystem impacts, microplastics have been found in the deepest recesses of the ocean, in pristine mountain glaciers, in breast milk and human bodies (Braun *et al.* 2021; Ragusa *et al.* 2021; Jenner *et al.* 2022; Horvatits *et al.* 2022). Research also shows that under a business-as-usual scenario, plastic could emit 19 per cent of global greenhouse gas GHG emissions allowed under a 1.5°C scenario by 2040, essentially making the goal out of reach (The Pew Charitable Trusts and Systemiq 2020). Significantly, the costs and impacts are borne by all but fall disproportionately on people in some of the world’s poorest nations.

This report indicates a heavy toll arising from the current linear plastics economy with preliminary estimates of the annual social and environmental costs linked to plastic pollution ranging between USD 300-600 billion per year, with some estimates above USD 1.5 trillion per year (Landrigan *et al.* 2023). Data shows potential litigation stemming from plastic pollution is estimated to exceed USD 20 billion in corporate liabilities in one country alone in the period 2022 to 2030 (Merkl and Charles 2022). These lawsuits express the tension between different parts of society based on the profits received by the plastic industry and the costs borne by society at large but particularly by the most vulnerable, particularly within the framework of a universally recognized human right to a clean, healthy and sustainable environment (UN General Assembly Resolution 76/300 of 28 July 2022).

An economically viable solution for all stakeholders does exist to achieve an end to plastic pollution. The transition to a new plastics economy is the most cost-effective way to ensure plastic pollution is substantially reduced by 2040, with solutions at hand that require vigilance, determination and creativity.

While significant, the investment costs of the systems change are less than the current investment trajectory, around USD 65 billion per year through 2040 as opposed to USD 113 billion per year. But time is of the essence: A 5-year delay could lead to an increase of 80 million metric tons of plastic pollution (The Pew Charitable Trusts and Systemiq 2020).

A transformed plastics economy will introduce new economic benefits by bringing new business opportunities particularly for those who adapt faster. By 2040, it is estimated a new plastics economy could:

- Create opportunities for jobs, income and innovation: 700,000 additional jobs; improved livelihoods for millions of workers in informal settings; close to USD 1.3 trillion (10.3 per cent) savings in direct public and private costs between 2021 and 2040.

- Reduce damage to human health and the environment by reducing exposure through an 80 per cent reduction of plastic pollution; 0.5 Gt CO₂-eq GHG emissions prevented annually; avoiding USD 3.3 trillion of environmental and social costs between 2021 and 2040 (32.5 per cent cost savings).
- Reduce liabilities, risks and litigation associated with damage from plastics pollution.
- When the direct, environmental and social cost savings are added up, more than USD 4.5 trillion are saved, or 20.3 per cent reduction in costs overall.

The systems change cannot be done in isolation due to the cross-border flows of plastics, liabilities and risks: it requires harmonised international action. Aligned and coordinated measures and obligations between nations and across value chains will build synergies and create a major shift in the plastics policy landscape. A harmonised knowledge base, driven by strong national reporting requirements, from which to take informed action, measure progress and refine regulatory interventions, depends on a globally coherent approach to monitoring and reporting. However, it is recognised that countries will start from different places to implement market transformations and the specific policy mix appropriate to a particular country will need to consider the trade-offs built into policy choices and options.

What will this future look like?

The analysis in this report examines the potential impacts of the systems change noted above. Figure ES 2, shows the plastic flows in the economy in 2040 in a business-as-usual linear economy (top) versus that projected in the systems change scenario (bottom). Under the systems change scenario, the inflow of new (virgin) material into the economy of short-lived plastics is more than halved while the utility is unchanged, by increasing the flows of materials that are reused or recycled into the economy to 27 per cent of the total. As a result, the outflow of mismanaged plastic waste ending in the environment decreases by over 80 per cent.

Turning off the tap of plastic pollution is within reach. This compass points to an integrated package of policy measures, clear pathways and new business models that are available to enable countries individually and collectively, to achieve that ambition.

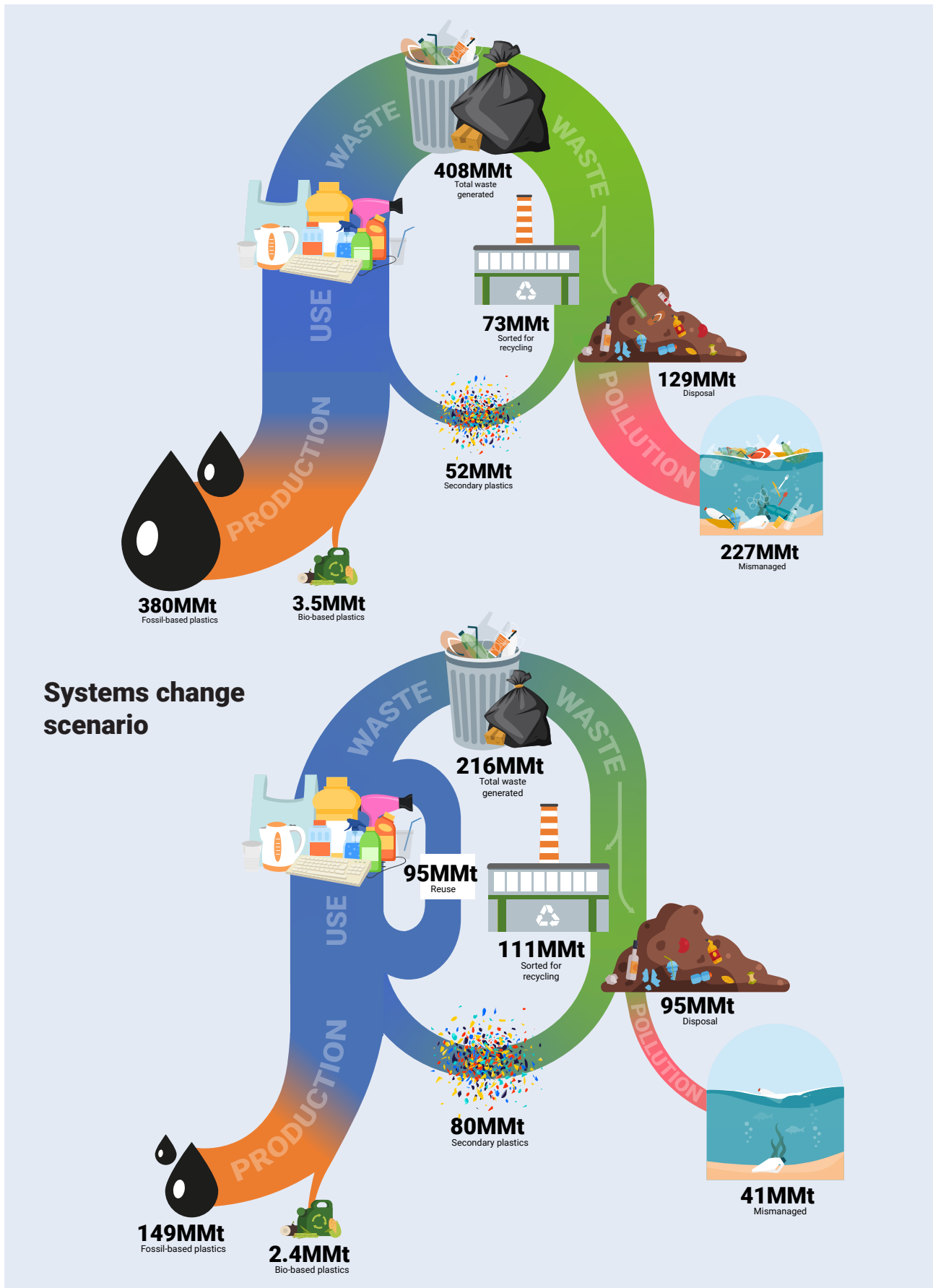


Figure ES 2: **Possible plastic futures.** Top: modelled plastic flows of short-lived plastics in 2040 under a business-as-usual scenario; Bottom: modelled plastic flows of short-lived plastics in 2040 under a systems change scenario. Source: UNEP modelling building on The Pew Charitable Trusts and Systemiq (2020) and OECD (2022).



