Scientists' Coalition for an Effective Plastics Treaty

Policy Brief: Transitioning to a safe and sustainable circular economy for plastics

The transition to a circular economy minimizes resource consumption and plastic pollution by moving away from the current linear economic model. The transition to a sustainable circular economy should focus on reducing production and consumption, and only secondly increase recycling rates, because large investments in waste handling facilities will promote the expanded production of waste due to technology lock-in. What is more, this is bound to occur at the cost of waste prevention and plastic reuse. In addition, unavoidable waste must be utilized more efficiently. Further, chemicals in plastics must be given sufficient attention, as hazardous chemicals are barriers to safe and transparent material preservation. Indeed, recycled and/or reused plastics may contain higher levels of hazardous chemicals than virgin plastics. Finally, reducing the overall volume of plastics introduced into the economy decreases unintended and unavoidable releases into the environment (including from micro- and nanoplastics and plastic chemicals).

What is the circular economy?

There are at least 114 different definitions of the circular economy [1], but in principle, a circular economy models its material flows on nature's self-regenerating closed loops of materials and chemical elements. In the circular economy, materials are kept in the value chain for as long as possible before they become waste, and this waste then becomes input for other processes. Ultimately, the circular economy becomes a continuous development cycle that sustainably meets human needs while optimizing resource utilization, thereby reducing environmental degradation, by becoming a restorative and regenerative system [2, 3]. Materials are designed primarily for longevity and reuse, and also for subsequent recycling, although currently there is an over-emphasis on plastics recycling [4, 5].

What are the principles for a safer circular economy for plastics?

I. Support the minimisation, safety and sustainability of plastic production

- Minimize plastics consumption [6].
- Cap overall global polymer production (including soluble polymers) [7, 8].
- Establish controls on the design, production, and use of polymers and related substances of concern based on safety and sustainability criteria [9, 10].
- Develop mandatory and standardized labeling, tracking, and reporting of polymers [11, 12].
- Avoid large-scale investments in waste handling facilities (such as chemical recycling) that promote the continued production of plastics waste due to technology lock-ins at the cost of waste prevention and plastic reuse [13-15].

II. Ensure safety and sustainability of plastic products across their lifecycle

- Identify societally essential and non-essential uses of plastics, inspired by the “essential-use” concept [16, 17].
- Mandate the redesign of plastic products for essential uses to keep them reused safely in the value chain for as long as possible [18].

- Require that the chemicals associated with all life stages of plastics, including non-intentionally added substances present in finished products, are known [19] and that they are tested for hazards (including endocrine disruption) using best available science [20, 21], and properly managed to minimize risk to human health and the environment.
- Establish criteria for material reuse and recycling that ensure safety and sustainability, including minimizing generation and leakage of micro- and nanoplastics (MNPs) into the environment throughout the entire life cycle [4], and improving material inertness [22, 23].
- Restrict the use of plastics which over their lifetime will shed MNPs ensuring human exposures (such as in potable water delivery) and test health and environmental effects of MNPs [24, 25].

III. <u>Design rights-based, safe, and sustainable systems</u>

- Incentivise restorative and regenerative circular materials and zero waste systems [26] including safe and sustainable reuse and the right to repair [27].
- Ensure the sourcing and use of materials and supportive systems are rights-based and adequately assessed for safety and sustainability [28].
- Ensure just transitions away from the unsafe handling of waste (especially child labor used for waste picking) to new materials and distribution systems [29].
- Evaluate legacy plastics carefully and separately for their inclusion in the circular economy, for example due to the presence of hazardous chemicals, to ensure safe and transparent material preservation [30].
- Create awareness for and minimize rebound effects (i.e. unintended consequences of single-issue focus solutions), considering Jevons Paradox [31] and lessons learned from regrettable substitutions [32].

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