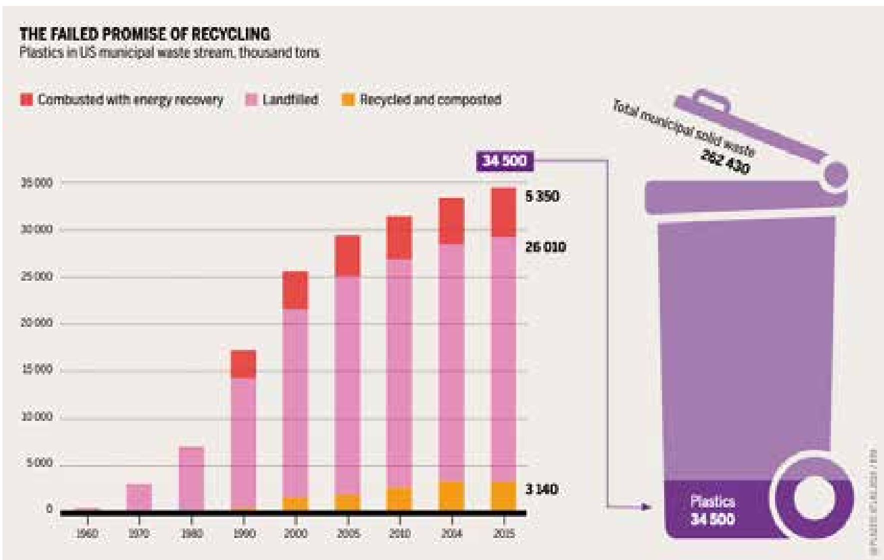
Recycling of Plastics, Transparency and Traceability

Plastic production has consequences

Plastics derive from hydrocarbons – either fossil feedstock, such as oil, coal or natural gas, or renewable, such as based on materials from plants, bacteria or fungi. Extraction or production of the feedstocks, and their conversion into basic chemicals used for producing plastic monomers, processing aids and plastic additives, have impacts: affects human health; claims land; needs energy; processing water and chemicals; and results in waste and pollution of air, water and soil.

Scope of the problem

- Plastic pollution is increasing relentlessly as production is growing, while waste management and recycling falls short[1,2] .
- Limiting plastic production to essential use based on globally harmonized criteria and recycling are some of the keys to addressing physical pollution.
- However, chemical pollution caused by plastic will remain unless harmful chemicals are phased out from plastic throughout the whole lifecycle.
- More than 10 000 chemicals are known to be used in plastics production, at least 2400 of which are hazardous[3].
- Numerous studies show that current recycling practices spread hazardous chemicals in completely uncontrolled manners using recycled plastics[4, 5]. Unknown chemicals undermine the safety of recycling.
- Transparency and traceability of chemicals in plastics throughout the entire lifecycle is the necessary precondition to toxic-free recycling and resource efficiency.



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Challenges with plastic reuse, repurpose, and mechanical recycling techniques

Plastic reuse and repurpose

The simplest method to delay plastic waste generation is to prioritse reuse of already manufactured plastic products by collecting and reusing them, preferably for their original intended use, without modifying the products. Old plastic items can also be turned into something new, depending on how creative people are. However, exposure to toxic chemicals already present in these products will continue.

An additional option is to design plastic products to have a longer lifespan. However, a longer lifespan of plastic can only primarily be achieved by using toxic additives that undermine human health and environmental safety.[6]

Mechanical recycling

Collected plastic waste is sorted according to polymeric composition and visible characteristics, such as colorations and other features, then shredded, smelted and extruded into plastic pellets that can be fed back into the manufacturing industry as secondary raw materials. However, plastics cannot be infintely mechanically recycled without losing its properties. In addition, poor waste collection and sorting result in mixed and contaminated plastic waste streams that undermine the effectiveness of mechanical recycling[7].

Moreover, toxic chemicals in plastic waste are recycled into secondary raw materials making recyclates a contaminated resource from the very beginning.

Toxic chemicals in recyclates undermine countries' ability to address plastic pollution by increasing product recycling content. Products from recycled plastic often contain chemicals more harmful than those made from virgin plastic[8].

Challenges with chemical recycling

Chemical recyling facilties only exist at a demostration level but are already permitted to release highly toxic chemicals from plastic additives and processing aids present in plastic waste. Toxic emissions arise in all chemical recycling processes[9].

In life cycle assessments of chemical recycling technologies, the following must be taken into consideration:

- Energy requirements and sources;
- Need for processing chemicals and sources feedstocks;
- Formation of hazardous byproducts as impurities in fractions that result from the breakdown of plastics into its constituent components;
- Atmospheric emissions of byproducts of pyrolytic or gasification processes;
- Other kinds of waste from the processes.

Lack of chemical transparency and traceability make all recycling options false solutions

Plastic durability can only be achieved by using toxic additives or modifying polymeric compositions. Without transparency requirements, stakeholders are deprived of the possibility of making informed decisions regarding toxics free product reuse or repurposing. Thus, further pollution and exposure continue.

Mechanical recycling results in contaminated recyclates that pollute entire value chains. Without transparency requirements, manufacturers of products with recycled content, consumers, and recyclers cannot make informed decisions regarding toxics free product manufacturing, purchasing or recycling.

Chemical recycling does not eliminate the need for transparency and traceability for plastic chemicals and polymers. The quality of chemical recycling is not independent of understanding the plastic composition and sorting of plastic waste prior to recycling. The output quality of chemical recycling plants directly relates to the input quality, that is to say, the composition of the plastic waste.

Misguided discussions about circular economy

Recycling is at the core of circular economy; a critical strategy to improve material resource efficiencies. Twelve resolutions confirming the value of circular economy have been adopted by the United Nations Environment Assembly (UNEA) so far[10].

What will impede circular economy is the lack of safe and usuable secondary raw materials. Unkown chemical compositions, or lower standards for secondary than for primary raw materials, will reduce demands for recyclates. This insight will grow increasingly strong in all countries, as all stakeholders become substantially enlightened.

Uncontrolled spreading of hazardous chemicals within material cycles in circular economy puts public health and the enviroment at risk and may lead to unexpected and high costs for society in the future. Decision makers should not be misguided by life cycle analyses with no consideration of the chemical contents of materials and products!

Better safe than sorry! Circular economy is important to put in place but must be done correctly from the start.

The foundation stone in a safe circular economy is transparency for chemical composition of materials and traceability

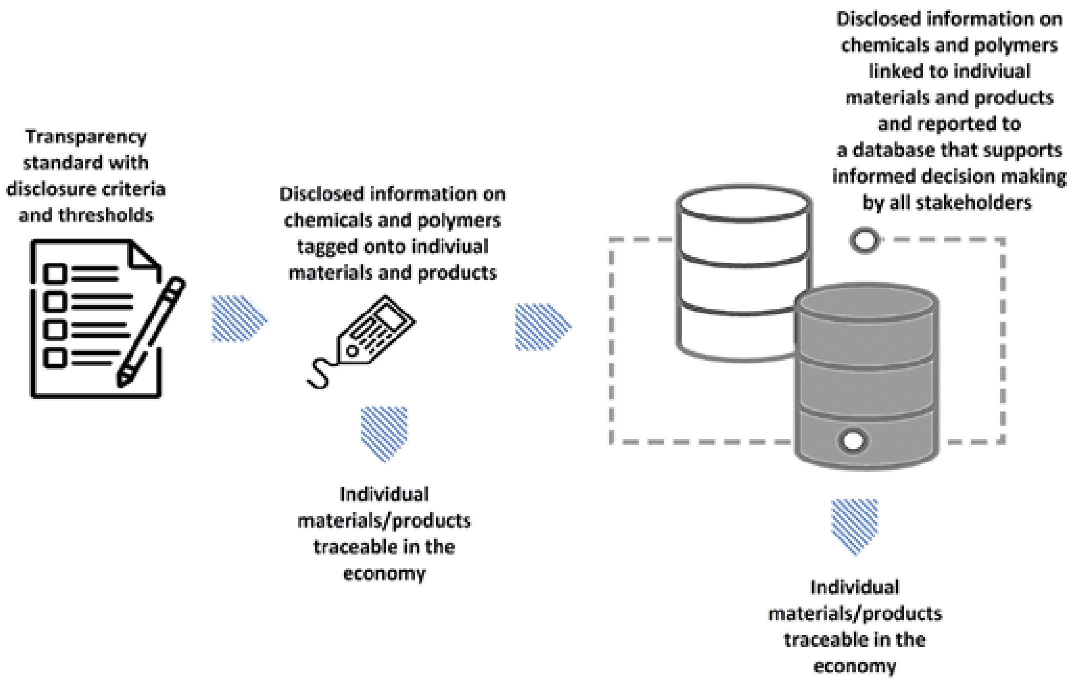
With transparency and traceability for chemicals and polymers in place, informed decisions can be made by all stakeholders:

- Regulators and policy makers;
- Designers;
- Product manufaturers;
- Importers and retailers;
- Consumers;
- Waste dealers, waste dismantlers, sorters and recylers.

Transparency and traceability will help the safe circular economy to get going.

It will help track regulated chemicals that cannot be immediately replaced, or that need use exemptions.

Also allowed chemicals need to be disclosed and traceable to waste dismantlers, sorters and recyclers, as these chemicals may interfere with recycling processes, and the properties of the recylcates used for secondary raw materials.



Transparency and traceability for chemicals and polymers in plastics requirements should be globally harmonized and mandatory in the Plastics Treaty

Many supply chains are multinational and globally harmonized transparency and traceability requirements will simplify trade and level the playing field for all stakeholders in the economy.

It will ensure equal right to know, safe products and no double standards in the circular economy, irrespective of jurisdiction.

Conclusion

Without globally harmonized requirements for transparency and traceability of toxic chemicals in plastics, using this material in the circular economy should be prohibited to avoid the uncontrolled spread of toxic substances in the plastics value chains.

Countries implementing the Stockholm and Basel Conventions should ensure disclosure of convention-regulated substances in plastic goods and wastes, including to the continued use of these substances because of numerous specific use exemptions.

It is better to store legacy plastics with toxic or unknown chemical compositions until technologies are available for safe handling.

It is important not to close the door to further technical innovations and developments in plastic recycling techniques. However, their approval should go hand in hand with the development of strict criteria and legally binding globally harmonized requirements for transparency and traceability of toxic chemicals.

Find more information here

INC2 Submission

Information webpage
www.globalchemicaltransparency.org

Endnotes

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Source infographic page 1: Heinrich Böll Foundation, Plastic Atlas

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