By email: plasticsconsultation@epa.nsw.gov.au

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Australian Academy of Science submission on the NSW Plastics: Next Steps consultation

The Australian Academy of Science (the Academy) makes the following comments:

- Different types of plastic have different materials with different properties, and many can continue to be a resource if recycled.
- Reducing plastic pollution will require monitoring protocols, a coordinated plastic pollution database, and a sustained multidisciplinary research agenda focusing on plastics that can degrade into harmless components, as well as developing technologies to recycle currently non-recyclable plastics.
- Science can transform how plastic is made, used, recycled and disposed.

Multifaceted approach to litter reduction

Plastic materials can be valuable resources if reused and recycled, and future strategies should follow the waste hierarchy.

The waste hierarchy categorises waste management into prevention, minimisation, reuse (including remanufacturing), recycling, energy recovery, and disposal. Prevention is preferred, while disposal is considered the least favoured option. This preference is determined by evaluating the environmental impact, material resource consumption, and the capacity of each option to promote the efficient utilisation of resources.

Societies worldwide rely on plastics. Plastics are an important part of many products, from vital medical equipment to enhancing fuel efficiency in automotive design. Not all plastics are the same, and policy should reflect this complexity. The properties of plastics vary; some break down more easily than others. Some continue to break down into microplastics, while others degrade into components that are of less concern for health and the environment.

Plastic products are a part of modern life, and policies should phase out unnecessary, non-recyclable, single-use and harmful plastics while promoting circularity and harmless plastic products. Waste management and plastic policies should encompass effective recycling strategies to manage existing plastics sustainably.

Ending plastic waste is a joint effort

Existing data on the magnitude and dispersion of plastic pollution is fragmented. Various research and community organisations (e.g. CSIRO, AIMS, NGOs and citizen science projects) collect data and maintain databases. NSW should seek to collaborate with these organisations and other states, territories and the Commonwealth government towards national monitoring protocols and contribute to a comprehensive plastic pollution database.

Plastic pollution is a global problem and domestic approaches should be aligned with international dimensions. The NSW databases should be connected to international datasets, such as the EUROqCHARM consortium. This global integration will provide valuable insights, foster knowledge exchange, and position NSW as an active participant in the broader, interconnected fight against plastic pollution.

175 member countries of the United Nations, including Australia, are negotiating a worldwide agreement to mitigate plastic pollution. The zero draft text of this agreement has 13 provisions that tackle different aspects of plastic pollution, including the use of recycled materials, phasing out single-use plastics, extended producer responsibility, just transition, transparency, tracking, monitoring and labelling.

Science can frame the future of plastics

Science can transform how plastic is made, used, recycled and disposed of.

Science-based and future-oriented strategies by the states and territories to mitigate plastic pollution must include a sustained, multidisciplinary research agenda. This could be done by improving the understanding of the future of plastics by supporting plastic research, in particular circular user-responsible waste-free applications, recovering waste that can be recycled, recycling of chemical packaging plastics, and technologies to recycle currently non-recyclable plastics.

Chemists with specialised knowledge in plastic degradation can play a pivotal role in discerning the long-term implications of various plastic types, distinguishing those likely to pose enduring challenges from those prone to breaking down into non-harmful molecular components. Chemists and other scientists can inform decision-making on the progression of plastic breakdown under diverse conditions. Understanding the intricacies of this breakdown process is essential to inform responses; for example, plastics disintegrating into microplastics exhibit an augmented surface area, intensifying their potential to absorb toxins from the surrounding environment.

Future recycling techniques have the potential to work with cutting-edge technologies such as advanced robotics, artificial intelligence, and molecular-level sorting to revolutionise the efficiency and precision of recycling processes, paving the way for a more sustainable and resource-efficient approach to waste management.

To discuss or clarify any aspect of this submission, please contact Mr Chris Anderson, Director Science Policy at Chris.Anderson@science.org.au.