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## **Australian Academy of Science submission on the House Inquiry into plastic pollution in Australia's oceans and waterways**

The Australian Academy of Science welcomes the opportunity to comment on the House Standing Committee on Climate Change, Energy, Environment and Water inquiry into plastic pollution in Australia's oceans and waterways.

The Academy:

- Urges recognition that not all plastics share the same properties
- Recommends continued engagement with international plastic pollution reduction efforts
- Stresses that reducing the harms from plastic pollution will require better data achieved through establishing a national monitoring protocol and plastic pollution database and a sustained multidisciplinary research agenda

### [Plastic pollution is a growing problem](#)

Society is reliant upon plastics. The degree of use of these materials has created a significant pollution problem. Plastics are now ubiquitous around the world. There is twice as much plastic in the world than animal life.<sup>1</sup> Practically all life on Earth can be affected by plastic pollution; from turtles found with plastic in their stomachs, to the effect that microplastics have on beach chemistry and microscopic beach life.<sup>2</sup> Humans are not exempt; plastic particles have recently been found in human blood.<sup>3</sup>

The vast majority of plastics are designed to become waste. One estimate is that over 8 million tonnes of this plastic waste leaks into the oceans each year.<sup>4</sup>

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; others degrade into components which are of less concern for health and the environment.

### [Solutions to plastic pollution require a multifaceted approach](#)

Plastic waste can be a valuable resource. Technologies are available to recycle and thereby reduce plastic pollution, however only a small proportion of plastic is actually recycled. Increasing this proportion will require both additional infrastructure and behavioural change, particularly as Australia moves towards a circular economy.

Solving the plastic pollution crisis will require a multifaceted approach. The Academy endorses the continued development and enactment of the National Plastic Plan as an important step towards a comprehensive national strategy to reduce plastic pollution. This strategy should give manufacturers and recyclers certainty. Industry and manufacturing can play a role in designing out plastic waste and upholding their responsibilities through extended producer responsibility schemes.<sup>5</sup>

The Committee should not neglect the role of Australian Government agencies in generating, recycling, and eliminating plastic pollution. For instance, the Bureau of Meteorology has been responsible for plastic pollution via weather balloons, which it is taking steps to address.<sup>6</sup> This response underscores the positive impacts that are possible through changes to internal government processes and policies.

### [Effective plastic pollution management must include international dimensions](#)

Plastic pollution does not respect borders and efforts to address it must include international dimensions. One example of this is how plastic pollution represents a major threat to the millions of migratory birds which visit Australia each year. Through numerous international agreements such as the Japan-Australia Migratory Bird Agreement, the China-Australia Migratory Bird Agreement and the Ramsar Convention on Wetlands, Australia

holds international commitments to protect these migratory birds which include provisions relevant to plastic pollution, such as those that require harm prevention and habitat protection.

The Academy welcomes Australian Government engagement with the United Nations Environment Assembly resolution to end plastic pollution by 2040. Previous international efforts such as the Montreal Protocol demonstrate that effective international anti-pollution measures are possible.

### We need better research and data

Addressing plastic pollution requires a sustained multidisciplinary research agenda. Chemists with expertise in plastic degradation can identify which plastics are likely to be a long-term problem, and which will break down into non-harmful molecular components. Chemists can also inform the progress of breakdown for plastics under different conditions. The process of breakdown has important secondary considerations as plastics which break down into microplastics increase their surface area—which increases their potential to absorb toxins from environments. Multidisciplinary research can also help design novel materials to replace plastics that are both cost-effective and less environmentally problematic.

Data on the scale and movement of plastic pollution is fragmented. Multiple NGOs have collected data and maintained databases on a local level. The National Plastics Plan, published in 2021, set as a goal to 'Partner with organisations to establish a national monitoring protocol and database for plastic pollution.'<sup>7</sup> It is unclear what action has been taken towards this step. The Committee should highlight this and urge establishment of a national monitoring protocol and plastic pollution database as a matter of critical importance.

To discuss or clarify any aspect of this submission, please contact Mr Chris Anderson, Director Science Policy

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<sup>1</sup> E. Elhacham *et al*, 'Global human-made mass exceeds all living biomass', *Nature* 588 (2020): 442-444.

<sup>2</sup> Jennifer L. Lavers, Alexander L. Bond, and Charles Rolsky, 'Far from a distraction: Plastic pollution and the planetary emergency', *Biological Conservation* 272 (2022): 109655.

<sup>3</sup> Heather A. Leslie, Martin J.M. van Velzen, Sicco H. Brandsma, A. Dick Vethaak, Juan J. Garcia-Vallejo, and Marja H. Lamoree, 'Discovery and quantification of plastic particle pollution in human blood', *Environment International*, 163 (2022): 107199.

<sup>4</sup> Jenna R. Jambeck *et al*, 'Plastic waste inputs from land into the ocean', *Science* 347, no. 6223 (13 February 2015): 768-771.

<sup>5</sup> Department of Climate Change, Energy, the Environment and Water, 'Product Stewardship', *National Waste Report 2013*, <https://www.dcceew.gov.au/environment/protection/waste/publications/national-waste-reports/2013/product-stewardship>

<sup>6</sup> Owen R. O'Shea, Mark Hamann, Walter Smith, and Heidi Taylor, 'Predictable pollution: An assessment of weather balloons and associated impacts on the marine environment – An example for the Great Barrier Reef, Australia', *Marine Pollution Bulletin* 79 (2014): 61-68; Bureau of Meteorology, *Balloon-based weather observations*, [http://www.bom.gov.au/faq/pdf/Balloon-basedWeatherObservations\\_FactSheet\\_SEPT18.pdf](http://www.bom.gov.au/faq/pdf/Balloon-basedWeatherObservations_FactSheet_SEPT18.pdf)

<sup>7</sup> Department of Agriculture, Water and Environment, *National Plastics Plan* (2021), <https://www.dcceew.gov.au/sites/default/files/documents/national-plastics-plan-2021.pdf>