



22 December 2022

Committee Secretariat
Standing Committee on Climate Change, Energy, Environment and Water
PO Box 6021
Canberra ACT 2600

Via email: CCEEW@aph.gov.au

Dear Committee Secretariat

Thank you for the opportunity to provide a submission on the Inquiry into plastic pollution in Australia's oceans and waterways.

Overarching remarks

Minderoo Foundation believes a circularity framework is key to reducing plastic pollution and supports the Australian Government's expressed intention to develop a circular economy framework, and the recent establishment of a Ministerial Advisory Group on the circular economy. Minderoo Foundation calls for a circular economy strategy that is grounded in the United Nations Sustainable Development Goalsⁱ and incorporates, among other measures, mandatory reduction targets and recycling requirements and standards, consistent definitions and labelling and right-to-repair obligations.

Key themes of our response are:

- **Management of plastics:** the need to urgently expand the scope of the National Plastics Plan and increase Australia's capacity to manage waste and recycle products.
- **Engagement:** the importance of continuing to strengthen and unify engagement between the Australia Federal Government and state and territory governments on plastics; and encouraging further community engagement with community driven initiatives, including First Nations and regional and remote communities.
- **Transparency:** the need for greater transparency across the life cycle of plastics.
- **Global initiatives:** the potential to draw from other global initiatives aimed at reducing plastic pollution.
- **Human Health:** the critical importance of ensuring that the direct and indirect links between plastic pollution and human health are managed at all stages of the life cycle of plastics.
- **First Nations voices:** the importance of genuine engagement with First Nations voices, including empowering First Nations businesses to drive innovation and develop solutions to address plastic pollution.



About Minderoo Foundation

The Minderoo Foundation is one of Australasia's largest philanthropic organisations, with AUD 2.6 billion committed to a range of initiatives which target intractable world challenges.

Minderoo Foundation's Plastics initiative seeks to eliminate the harm from plastic to people and the planet. Our vision is a world of no plastic waste, made possible by an absolute reduction in virgin fossil fuel plastic production and consumption, and a thriving circular plastics economy where safety is a priority.

To achieve this, we engage across the scientific, health, policy and regulatory, industry and civil society communities to pursue both regulatory and market-based solutions. Our projects span the entire plastics value chain, focusing on key issues such as transparency, human health impacts, safe redesign, and effective management of existing fossil-fuel plastic.

Yours,

Emma Silver
Head of Public Affairs and Advocacy
Plastics
Encl. (1)



Minderoo Foundation response to the Australian Government Inquiry into plastic pollution in Australia's oceans and waterways (the Inquiry)

1. The environmental impacts of plastic pollution particularly in oceans and waterways

It is estimated that the amount of plastic that entered the ocean in 2010 was approximately 5-13 million tonnes.ⁱⁱ This is predicted to double by 2030 if the current rates continue.ⁱⁱⁱ More specifically, plastic accounts for 50-80% of debris accumulating in marine environments,^{iv} and can enter aquatic ecosystems through a multitude of routes, including wastewater pathways, road runoff, mismanaged waste, fishing and aquaculture activities, as well as illegal dumping.^{v vi}

Plastic pollution is associated with a multitude of adverse environmental impacts on aquatic environments. Although extensive research has been undertaken to date, the impacts of plastics in the ocean and waterways are not yet fully understood. It is clear, however, that plastic has many detrimental effects on marine organisms. Packaging materials, netting and discarded fishing gear can cause entanglement, injury and even death through constriction; while ingestion of plastic particles can have immediate effects, such as intestinal blockages and organ punctures, and long-term effects, impacting sex determination in some organisms, and causing nervous system damage in others^{vii}.

Plastics are composed of a polymer matrix, mixed with additives such as plasticisers and flame retardants, which are usually not chemically bonded to the polymer, and can leach out into the air, water and soil during all phases of the product life cycle.^{viii} Many chemical additives are toxic to flora and fauna and are also contained in the tiny particles (micro- and nano-plastics) that form as plastic breaks up into smaller and smaller pieces. The particles and the toxic chemical additives enter and move up the food chain, bioaccumulating in larger species, including humans via consumption of seafood.^{ix}

Plastic particles can also absorb toxic pollutants present in the ocean and other waterways, further compounding health impacts in marine organisms ingesting the plastic. This includes organ damage, hormone disruption and reproductive changes, as well as greater susceptibility to disease.^x Micro- and nano-particles in fact serve as sinks for various poisonous compounds, enhancing their bioavailability, toxicity, and transportation between various aquatic habitats.^{xi}

Given the numerous pathways in which plastics over their life cycle^{xii} can enter into oceans and waterways, including through aquatic and land-based sources, and the deleterious environmental impacts of the marine pollution described above, it is important that the Australian Government is taking a holistic approach to managing plastic pollution.

2. The effectiveness of Australia's plastics management framework under the National Plastics Plan and related policies to reduce plastic pollution particularly in oceans and waterways

Minderoo acknowledges the efforts made by the Australian Government to manage plastic pollution, particularly over the last five years. We see further opportunity for the Australian



Government to strengthen the current plastics management framework under the National Plastics Plan 2021 (NPP) by pursuing more ambitious targets and increasing the scope of actions set out in the NPP, including by immediately widening the scope of the single-use plastic items included in the phase-out of problematic plastics. We also recommend fast-tracking investment into Australia's waste management infrastructure to support development of adequate and reliable domestic capacity to collect, sort, and recycle material, including adequate facilities to recycle soft plastics.

Single-use plastics account for most of the plastic that becomes waste globally.^{xiii} With a global ranking of 15th for generation of single-use plastic waste, Minderoo strongly advocates for consideration of additional measures which will result in an overall reduction in the domestic consumption of plastics whilst accelerating the transition towards a circular plastics economy. These measures could, for example, address the market failures that favour production of virgin fossil fuel plastics versus circular plastic material management (re-use, recycling and use of alternative non-fossil fuel materials), and could include working with industry to secure commitments to use more recycled plastic in products and packaging.

3. The effectiveness of the Australian Government's engagement with States, Territories, industry and non-government organisations to reduce plastic pollution particularly in oceans and waterways

Minderoo believes that effective engagement by the Australian Government is critical to addressing the plastic pollution crisis.

States and territories

Minderoo commends actions being taken by individual state and territory governments to address plastic pollution and to engage with communities at their respective state and territory level. For example, the recent engagement by the Western Australia Government in online workshops and a public consultation in respect to the proposed single-use plastic bans under Stage 2 of the Western Australia Plan for Plastics.^{xiv}

Regarding the Australian Government's effective engagement with state and territory governments, we support the collaboration and development of the National Waste Policy Action Plan 2019 and the NPP. However, we caution the disparities of the set targets in the implementation at state and territory level. Strengthening the domestic leadership by the Australian Government can ensure a unified framework across Australia in addressing plastic pollution and enable the effective implementation of these measures. A nationally consistent framework will also provide clarity over the current disparities across the state and territory led approaches. For implementation to be truly effective, the framework will require state and territory governments to work with communities to develop the solutions required to achieve the targets set under a unified framework.

Industry and non-government organisations

Minderoo welcomes this Inquiry as a point of engagement for industry and non-government organisations (NGOs) with the Australian Government. Following this part of the Inquiry, we believe



open hearings which include the opportunity for oral testimonies will enable further genuine engagement by industry and NGOs on this issue.

Outside of the Inquiry, Minderoo recommends the Australian Government continue to engage with Industry and NGOs with co-designing and collaboration of policies addressing plastic pollution, particularly for waterways and oceans. Co-design and collaboration can empower lived experiences and ensure that policies are meeting specific community needs across Australia.

First Nations voices

Minderoo strongly supports engagement at Federal, state and territory level of the Australian Government specifically with First Nations led NGOs and First Nations experts in the field of plastic pollution. Further, we emphasise the importance of engagement by the Australian Government with First Nations people living in remote and regional communities in Australia. Targeted solutions that are co-designed and co-led by communities are critically important in addressing plastic pollution.

4. The effectiveness of community campaigns to reduce plastic pollution particularly in oceans and waterways and encourage the use of alternative materials

Following on from point 3 above in respect to co-design and collaboration, effective community campaigns require direct input, engagement and shared decision making with the Australian Government by community members. This will ensure that the campaigns are designed to meet the needs of each community and will directly impact on their success. Minderoo strongly supports community campaigns designed and led by First Nations people for First Nations people, this includes engagement with remote and regional communities.

5. Global initiatives underway to reduce plastic pollution particularly in oceans and waterways

Addressing plastic pollution in the environment requires actions to be taken across the life cycle of plastics. The Organisation for Economic Co-operation and Development (OECD) Global Plastics Outlook – Economic Drivers Environmental Impacts and Policy Options^{xv} (OECD Report) highlights five policy approaches that can be used to reduce plastic leakage. These are:^{xvi}

1. Restrain demand for plastics
2. Designing for circularity of plastics
3. Enhancing recycling practices
4. Close leakage pathways
5. Clean up plastics from the environment

We emphasise the importance of governments addressing each of the five policy approaches and see an opportunity for the Australian Government to draw from each policy approach, to engage with countries who have implemented initiatives and to understand their strengths and learnings and to build upon the policies which would be suitable within the Australian context. Minderoo also recognises the important work at a global level by the Food and Agriculture Organization of the United Nations, investigating the use of microplastics in agriculture^{xvii} and the World Health Organisation's work on the impact of microplastics in food on human health.^{xviii}



Minderoo seeks to highlight the following global initiatives underway that we believe Australia can draw from to reduce plastic pollution:

- Bans on single-use items: we recognise the work of the European Union to extend their single-use plastic bans to include a range of plastic products that are not considered under the NPP including 'fishing gear containing plastics'.^{xix} In addition to this, the EU directive places:
 - marketing requirements on certain sanitary products, wet wipes and tobacco products with plastic filters;^{xx}
 - responsibility on member states to take steps to raise consumer awareness about certain single-use plastic products including balloons, tobacco, wet wipes and sanitary products;^{xxi} and
 - requirements of member states to establish extended producer responsibility schemes on certain plastic items.^{xxii}
- Extended Producer Responsibility (EPR) Schemes: derived from European legislation,^{xxiii} the EPR scheme in the Netherlands works on the 'polluter pays' principles and places responsibility of collecting and recycling certain packaging, with a focus on plastics, on the producers and importers who release this packaging onto the Dutch market.^{xxiv} In 2020, 80% of packaging released onto the Dutch market was recycled.^{xxv}

Minderoo sees an opportunity for the Australian Government to introduce an EPR scheme that has a focus on packaging, particularly plastics, to increase recycling rates which will aid in preventing plastic pollution. Minderoo also sees an opportunity to utilise EPR schemes further and to consider an industry led contribution on polymer producers.^{xxvi}

Greater Transparency

Historically policies made by government and regulators that target plastics have mainly focused on finished plastic products, with little attention directed at producers of 'polymers', the building blocks for plastics.^{xxvii} Without transparency across the complete plastics life cycle, governments and regulators lack critical information to design effective policies addressing plastic pollution in all its forms.^{xxviii}

Minderoo Foundation points in particular to the need for reporting standards that:

- measure total plastic and polymer production, broken down by polymer type and application;
- enable visibility on plastic material composition, including additives and other chemicals used to make plastics; and
- include metrics measuring recycled and/or re-used materials, including their composition (polymers, additives and other chemicals used to make plastic).

Global Plastics Treaty

The negotiations towards an international legally binding instrument to end plastic pollution, including in the marine environment, provide an opportunity to harmonise international, regional and domestic initiatives across the life cycle of plastics. We strongly support the Australian Government's stated high ambition for these negotiations, and the Government's active



participation in the High Ambition Coalition to End Plastic Pollution. Strengthening Australia's domestic leadership on plastic pollution will contribute to Australia's strong positioning to lead internationally in this space.

6. Other relevant matter

6.1 Human Health

Minderoo emphasises the importance of considering the human health links, both direct and indirect, to plastic pollution. Plastics can break up into microplastics which have been found in human stools.^{xxix} Microplastics can break up even further into tiny nano-plastics. In collaboration with the University of Queensland, Minderoo Foundation has created the first contamination-controlled laboratory to develop reliable measuring techniques to determine whether these nanoparticles are able to cross into organs and cells and whether they can breach the blood brain barrier.^{xxx} Plastics, including single-use plastics, also contain chemical additives that can leach out and there is an increasing amount of evidence linking exposure to these plastic chemicals and human health impacts.^{xxxi xxxii xxxiii xxxiv xxxv}

In a recent study conducted by Minderoo in partnership with UNEP's Principles of Sustainable Insurance, law firm Clyde & Co., and risk analytics experts Praedicat, ('The Price of Plastic Pollution Report') we estimated that the cost to society from plastic pollution exceeds US\$100 billion per year, driven mostly by harms to human health.^{xxxvi} We call for health and safety to be a priority focus under Australia's framework to address plastic pollution.

6.2 First Nations Voices

Minderoo highlights that the environmental and human health impacts of plastic pollution may disproportionately affect First Nations people particularly in regional and remote communities across Australia. We emphasise the importance of the Australian Government actively listening to First Nations voices and engaging with Indigenous-led solutions in addressing the impacts of plastic pollution. This includes empowering First Nations businesses to drive innovation in emerging industries and allowing for localised opportunities. We strongly advocate that First Nations voices are crucial to reversing the problem of plastic pollution.^{xxxvii}



- ⁱ United Nations Department of Economic and Social Affairs, *The 17 Goals*. Available at: <https://sdgs.un.org/goals> (Accessed: 14 December 2022).
- ⁱⁱ Jambeck, J. R. et al. (2015) 'Plastic waste inputs from land into the ocean' *Science*, 347, pp. 768–771. Available at DOI: [10.1126/science.1260352](https://doi.org/10.1126/science.1260352) (accessed 20 December 2022).
- ⁱⁱⁱ Amaral-Zettler, L, Zettler, E, and Mincer, T. (2020) 'Ecology of the plastisphere', *Nature Reviews Microbiology*, 18(3), pp. 139-151. Available at: <https://www.nature.com/articles/s41579-019-0308-0> (accessed 14 December 2022).
- ^{iv} Barnes DKA, Galgani F, Thompson RC, Barlaz M. (2009) 'Accumulation and fragmentation of plastic debris in global environments' *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1526), pp. 1985-1998. Available at: <https://doi.org/10.1098/rstb.2008.0205> (accessed 12 December 2022)
- ^v Khalid N, Aqeel M, Noman A, Khan SM, Akhter N (2021) 'Interactions and effects of microplastics with heavy metals in aquatic and terrestrial environments', *Environmental Pollution*, 290. Available at: <https://doi.org/10.1016/j.envpol.2021.118104>.
- ^{vi} Watt E, Picard M, Maldonado B, et al. (2021) 'Ocean plastics: environmental implications and potential routes for mitigation – a perspective', *RSC Advances*, 11(35) pp. 21447-21462, doi:10.1039/D1RA00353D. Available at: <https://pubs.rsc.org/en/content/articlelanding/2021/ra/d1ra00353d> (accessed 12 December 2022).
- ^{vii} Watt E, Picard M, Maldonado B, et al. (2021) 'Ocean plastics: environmental implications and potential routes for mitigation – a perspective', *RSC Advances*, 11(35) pp. 21447-21462, doi:10.1039/D1RA00353D. Available at: <https://pubs.rsc.org/en/content/articlelanding/2021/ra/d1ra00353d> (accessed 12 December 2022).
- ^{viii} Hahladakis, J, Velis, C, Weber, R, Iacovidou, E. and Purnell, P. (2018) 'An overview of chemical additives present in plastics: Migration, release, fate and environmental impact during their use, disposal and recycling' *Journal of Hazardous Materials*, 344, pp. 179-199. Available at: <https://www.sciencedirect.com/science/article/pii/S030438941730763X> (Accessed: 14 December 2022).
- ^{ix} Gallo, F, Fossi, C, Weber, R, Santillo, D, Sousa, J, Ingram, I, Nadal, A and Romano, D. (2018) 'Marine litter plastics and microplastics and their toxic chemical components: the need for urgent preventative measures', *Environmental Science Europe*, 30, pp. 13. Available at: <https://enveurope.springeropen.com/articles/10.1186/s12302-018-0139-z> (accessed 12 December 2022).
- ^x Gallo, F, Fossi, C, Weber, R, Santillo, D, Sousa, J, Ingram, I, Nadal, A and Romano, D. (2018) 'Marine litter plastics and microplastics and their toxic chemical components: the need for urgent preventative measures', *Environmental Science Europe*, 30, pp. 13. Available at: <https://enveurope.springeropen.com/articles/10.1186/s12302-018-0139-z> (accessed 12 December 2022).
- ^{xi} Amobonye A, Bhagwat P, Raveendran S, Singh S and Pillai S. (2021) 'Environmental Impacts of Microplastics and Nanoplastics: A Current Overview'. *Frontiers in Microbiology*, 12:768297, doi: 10.3389/fmicb.2021.768297. Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8714882/> (accessed 12 December 2022).
- ^{xii} Watt E, Picard M, Maldonado B, et al. (2021) 'Ocean plastics: environmental implications and potential routes for mitigation – a perspective', *RSC Advances*, 11(35) pp. 21447-21462, doi:10.1039/D1RA00353D. Available at: <https://pubs.rsc.org/en/content/articlelanding/2021/ra/d1ra00353d> (accessed 12 December 2022).
- ^{xiii} Charles, D, Kimman, L and Saran, N. (2021) 'The Plastic Waste Makers Index', Minderoo Foundation, pp. 11. Available at: <https://cdn.minderoo.org/content/uploads/2021/05/27094234/20211105-Plastic-Waste-Makers-Index.pdf> (Accessed: 14 December 2022).
- ^{xiv} Government of Western Australia (2022) *Western Australia's Plan for Plastics*. Available at <https://www.wa.gov.au/service/environment/business-and-community-assistance/western-australias-plan-plastics> (Accessed: 14 December 2022).
- ^{xv} Organisation for Economic Co-operation and Development. (2022) 'OECD Global Plastics Outlook – Economic Drivers, Environmental Impacts and Policy Options'. Available at: <https://doi.org/10.1787/de747aef-en> (Accessed 14 December 2022).
- ^{xvi} Organisation for Economic Co-operation and Development. (2022) 'OECD Global Plastics Outlook – Economic Drivers, Environmental Impacts and Policy Options' pp. 119. Available at: <https://doi.org/10.1787/de747aef-en> (Accessed 14 December 2022); and Organisation for Economic Co-operation and Development. (2022) 'Global Plastics Outlook: Policy Scenarios to 2060'. Available at: <https://doi.org/10.1787/aa1edf33-en> (accessed 14 December 2022).
- ^{xvii} Garrido Gamarro, E. & Costanzo, V. (2022) 'Microplastics in food commodities – A food safety review on human exposure through dietary sources' *Food Safety and Quality*, series no. 18. Available at: <https://doi.org/10.4060/cc2392en> (Accessed: 14 December 2022).



- ^{xviii} World Health Organization (2022) 'Dietary and inhalation exposure to nano- and microplastic particles and potential implications for human health'. Available at: <https://www.who.int/publications/i/item/9789240054608> (Accessed 14 December 2022).
- ^{xix} Directive (EU) 2019/904 article 2 (1).
- ^{xx} Directive (EU) 2019/904 article 7, Annex Part D.
- ^{xxi} Directive (EU) 2019/904 article 10, Annex Part G.
- ^{xxii} Directive (EU) 2019/904 article 8, Annex part D and E.
- ^{xxiii} European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste (as amended by Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018).
- ^{xxiv} The responsibility for producers and importers under this EPR is administered by the Afvalfonds Verpakkingen (Packaging Waste Fund). For more information, see Afvalfonds Verpakkingen (Packaging Waste Fund). *We are Stichting Afvalfonds Verpakkingen ('Packaging Waste Fund')*. Available at: <https://www.afvalfondsverpakkingen.nl/en/node/2> (Accessed 14 December 2022).
- ^{xxv} Afvalfonds Verpakkingen (Packaging Waste Fund). *Our recycling results*. Available at: <https://www.afvalfondsverpakkingen.nl/en/node/390> (Accessed 14 December 2022).
- ^{xxvi} Forrest, A. (2019), *Pelagic Ecology and solutions for a troubled ocean*, PhD thesis, The University of Western Australia, Perth, viewed 14 December 2022, <https://api.research-repository.uwa.edu.au/ws/portalfiles/portal/65350982/TH19_316_THESIS_DOCTOR_OF_PHILOSOPHY_FORREST_John_Andrew_Henry_2019.pdf>.
- ^{xxvii} Charles, D, Kimman, L and Saran, N. (2021) 'The Plastic Waste Makers Index', Minderoo Foundation, pp. 11. Available at: <https://cdn.minderoo.org/content/uploads/2021/05/27094234/20211105-Plastic-Waste-Makers-Index.pdf> (Accessed: 14 December 2022).
- ^{xxviii} Charles, D, Kimman, L and Saran, N. (2021) 'The Plastic Waste Makers Index', Minderoo Foundation, pp. 11. Available at: <https://cdn.minderoo.org/content/uploads/2021/05/27094234/20211105-Plastic-Waste-Makers-Index.pdf> (Accessed: 14 December 2022).
- ^{xxix} Yan Z, Liu Y, Zhang T, Zhang F, Ren H, Zhang Y. (2022) 'Analysis of microplastics in human feces reveals a correlation between fecal microplastics and inflammatory bowel disease status' *Environment Science Technology*, 56(1), pp. 414-421. Available at <https://pubs.acs.org/doi/10.1021/acs.est.1c03924> (accessed 15 December 2022).
- ^{xxx} Minderoo Foundation. (2022) *Minderoo lab to detect and measure tiny plastic particles in the human body*. Available at: <https://www.minderoo.org/plastics-and-human-health/news/minderoo-lab-to-detect-and-measure-tiny-plastic-particles-in-the-human-body/> (accessed 15 December 2022).
- ^{xxxi} Lithner D, Larsson A, and Dave G. (2011) 'Environmental and health hazard ranking and assessment of plastic polymers based on chemical composition' *Sci Total Environment*, 409(18), pp. 3309-3324. Available at: [doi:10.1016/J.SCITOTENV.2011.04.038](https://doi.org/10.1016/J.SCITOTENV.2011.04.038) (accessed 14 December 2022).
- ^{xxxii} Vandenberg L, Colborn T, Hayes T, et al. (2012) 'Hormones and endocrine-disrupting chemicals: low-dose effects and nonmonotonic dose responses', *Endocrine Reviews*, doi:10.1210/ER.2011-1050, 33(3) pp. 378-455. Available at: <https://pubmed.ncbi.nlm.nih.gov/22419778/> (accessed 14 December 2022).
- ^{xxxiii} Demeneix BA. (2019) 'Evidence for Prenatal Exposure to Thyroid Disruptors and Adverse Effects on Brain Development', *European Thyroid Journal*, doi:10.1159/000504668, 8(6), pp. 283-292.
- ^{xxxiv} Vethaak AD, Legler J. (2021) 'Microplastics and human health' *Science*, 371(6530), pp. 672-674. Available at: <https://www.science.org/doi/10.1126/science.abe5041> (accessed 14 December 2022).
- ^{xxxv} Symeonides C, Brunner M, Mulders Y, et al. (2021) 'Buy-now-pay-later: Hazards to human and planetary health from plastics production, use and waste' *Journal of Paediatric Child Health*, 57(11), pp. 1795-1804. Available at [doi:10.1111/jpc.15777](https://doi.org/10.1111/jpc.15777) (accessed 14 December 2022).
- ^{xxxvi} Merkl, A, and Charles, D. (2022) 'The Price of Plastic Pollution: Social Costs and Corporate Liabilities', Minderoo Foundation. Available at: <https://cdn.minderoo.org/content/uploads/2022/10/14130457/The-Price-of-Plastic-Pollution.pdf> (Accessed: 14 December 2022).
- ^{xxxvii} Fuller, S, Ngata, T, Borrelle, S and Farrelly, T. (2022) 'Plastic pollution as waste colonialisms in Te Moananui', *Journal of Political Ecology*, 29(1), pp. 535. Available at <https://journals.librarypublishing.arizona.edu/jpe/article/id/2401/> (Accessed 14 December 2022).