March 5, 2026

RE: **Submission Regarding the Impact of Microplastics, Toxics, and PFAS on Human Health and Reproductive Outcomes**

The Parliamentary Committee on Health and the Environment
Committee Secretary
Senate Standing Committee on Community Affairs
P O Box 6100
Parliament House
Canberra ACT

Dear Community Affairs References Committee,

My name is Jackie Nuñez, Founder of The Last Plastic Straw and a Plastic Pollution Coalition Notable.

Plastic Pollution Coalition is a U.S. based non-profit communications and advocacy organization that collaborates with an expansive global alliance of organizations, businesses, and individuals to create a more just, equitable, regenerative world free of plastic pollution and its toxic impacts.

The Last Plastic Straw is a movement to “speak truth to plastic” by educating the public about the absurdity of wasteful single-use plastic, its effects on our health, environment and the ocean. Our work focuses on prevention and real solutions to plastic pollution, from extraction to waste.

Summary

This submission outlines the critical public health crisis from microplastics, nanoplastics, and associated toxic chemicals, including Per-and Polyfluoroalkyl Substances (PFAS) affecting our health and the health of our planet. Focusing on emerging research and recent legislative models for chemicals in consumer goods and reusable food packaging, we urge the Parliament to establish stringent national standards to mitigate the threats these materials pose to reproductive health, endocrine systems, and long-term physiological well-being.

Microplastics and Nanoplastics are everywhere

As highlighted by Plastic Pollution Coalition[1], microplastics (particles smaller than 5mm) and nanoplastics (smaller than 1 micrometer) have infiltrated every level of the global environment. These particles are not only environmental contaminants; they are biological ones. Plastic particles are known to both absorb toxic chemicals that pollute our planet and leach them[2] into living organisms[3] and into Earth's ecosystems.[4] Micro-and nano plastics are a contaminate in our plants, wild and domestic animals and mammals, in our soil, air, water, in our food chain, and in our bodies. Plastic particles are easily colonized by bacteria, viruses, fungi,[5] and other microscopic organisms that can cause disease. Human exposure occurs through ingestion, inhalation, and dermal contact. Research has confirmed the presence of these particles throughout the human body including in blood, lung tissue, the placenta, and even breast milk.[6] Nanoplastics, due to their miniscule size, have been found to cross the blood-brain barrier and penetrate cell membranes, which can lead to cellular damage and chronic inflammation.[7]

Toxics In, Toxics Out

It's not just the size of the material, it's the fossil fuels and chemicals it's made of. The chemical additives that are used to give plastic its various properties, such as phthalates, Bisphenol A (BPA), and PFAS, are known endocrine-disrupting chemicals (EDCs). These substances mimic and interfere with the body's natural hormones[8], leading to:

- Fertility Issues: EDCs are linked to decreased sperm counts, poor egg quality, and increased rates of miscarriage.[9]
- Reproductive Cancers: There is a significant correlation between exposure to plastic-associated toxics and increased incidences of hormone-sensitive cancers, including breast, ovarian, and prostate cancer.[10]
- Developmental Risks: Exposure in utero via the placenta can lead to developmental delays and predispose children to metabolic and respiratory diseases later in life.[11]

PFAS "Forever Chemicals"

PFAS are referred to as "forever chemicals" due to their persistence in the environment and propensity to accumulate in our bodies, and they are widely used in food packaging and

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[1]https://www.plasticpollutioncoalition.org/blog/2023/1/27/microplastics-nanoplastics-and-you
[2] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068600/
[3] https://www.sciencedirect.com/science/article/pii/S1382668918305647
[4] https://pubs.acs.org/doi/full/10.1021/acs.est.1c02272
[5]https://www.science.org/content/article/some-infectious-viruses-hitchhike-tiny-plastics-found-water
[6]https://www.theguardian.com/environment/2022/mar/24/microplastics-found-in-human-blood-for-first-time
[7] https://pmc.ncbi.nlm.nih.gov/articles/PMC12616133/
[8] https://www.endocrine.org/topics/edc/plastics-edcs-and-health
[9]https://www.ncbi.nlm.nih.gov/books/NBK576379/#:~:text=Endocrine%2Ddisrupting%20chemicals%20have%20been,%2C%20and%20placentation.%5B14%5D
[10]https://www.sciencedirect.com/science/article/pii/S0045653522030533#:~:text=Highlights,is%20essential%20for%20tumor%20progression.
[11]https://pmc.ncbi.nlm.nih.gov/articles/PMC11906117/#:~:text=Placental%20substrate%20transport%2C%20metabolism%20and,prevent%20abnormal%20neurodevelopment%20or%20injury.

consumer goods. These toxic chemicals are linked to immune system suppression, liver damage, and thyroid disruption.[12] When combined with the physical presence of microplastic particles, the cumulative toxicological load on the human body is unprecedented.[13]

Legislative Precedents and Recommendations

To address these risks, Parliament should utilize plastic reduction strategies and policies that reduce plastic production and the use of single-use plastic, and eliminate chemicals of concern used in plastic production, and in plastic products. Additionally, Parliament should look to emerging standards and successful regional policies for non-toxic materials in reuse and refill systems. Plastic is a transboundary issue, and no one country can address this global health crisis. Australia must support a strong United Nations Global Plastic Treaty with binding measures that can harmonize plastic policy, and protect health for all communities around the world.

Please refer to the Global Plastic Law database and resource center, managed by Plastic Pollution Coalition, for more information on passed legislation covering the full lifecycle of plastic. https://www.globalplasticlaws.org/

Examples of effective policy and standards approaches:

1. **The Hawaii Reuse Model (Bill 221)**: Recent legislation in Hawai'i County provides a vital blueprint for future-proofing reuse systems. By restricting single-use plastics and, crucially, excluding plastic materials from defined "reuse" categories, Hawaii acknowledges that plastic "reusable" containers often shed microplastics during high-heat commercial washing. Parliament should prioritize non-toxic, non-plastic materials (such as stainless steel or glass) in national reuse frameworks to ensure that "circular" solutions do not inadvertently increase toxic exposure.[14]
2. **Reuse For Dine In Policy:** Over 20% of disposable foodware and packaging used by restaurants and food service businesses could be eliminated by making reusables the norm for onsite dining. A reuse for onsite dining policy requires restaurants and other food service businesses to provide only reusable serviceware for customers eating on the premises.[15]
3. **National P3 Container Standards:** The adoption of standards similar to the recent Global P3 container guidelines, (RES-001:26/CSA R304:26 Reusable

[12]https://www.nrdc.org/stories/forever-chemicals-called-pfas-show-your-food-clothes-and-home#:~:text=progress%20against%20PFAS-,What%20are%20the%20health%20effects%20of%20PFAS?,(EPA)%20or%20the%20public.
[13]https://www.sciencedirect.com/science/article/pii/S0269749124018505?via%3Dihub#sec3
[14]https://bigislandnow.com/2025/12/03/hawai%CA%BBi-county-council-passes-bill-to-restrict-single-use-plastic-foodware-serviceware/

[15]https://upstreamsolutions.org/blog/tips-to-advocate-for-reuse-for-onsite-dining-in-your-community

packaging system design standard: Container design and performance)[16] which mandate the removal of harmful chemicals from food-contact materials, is essential. By eliminating toxics at the source, we can prevent chemical leaching from plastic containers and packaging into foods, particularly those that are acidic or hot. Below are the restricted substances lists that are a part of this standard.

5.1.1 Restricted materials

Containers shall not contain the following materials:

a) melamine;
b) organometallics;
c) oxo-degradable additives;
Note: Oxo-degradable additives are used as catalysts to break down plastic when exposed to heat and light.
Plastics that contain oxo-degradable additives are sometimes called “oxo-degradable plastics”.
d) polycarbonate;
e) polystyrene and expanded polystyrene;
f) polyurethane; and
g) polyvinyl chloride.

5.1.2 Restricted chemicals and chemical groups

The following chemicals and chemical groups shall not be intentionally added to containers during the manufacturing process:

a) acetophenones/benzophenones;
b) alkylphenols;
c) aromatic amines;
d) azodyes;
e) benzophenone and its derivatives;
f) benzothiazoles;
g) benzotriazoles;
h) bisphenols;
i) cadmium and cadmium compounds;
j) carbon black pigment;
k) chlorinated paraffins;
l) diisocyanates;
m) formaldehyde;
n) halogenated flame retardants;
o) hexavalent chromium and compounds;
p) lead and lead compounds;
q) mercury and mercury compounds;
r) parabens;

[16]https://www.pr3standards.org/pr3-containers-standard

s) perchlorate;
t) perfluoroalkyl and polyfluoroalkyl substances (PFAS);
u) phthalates;
v) salicylate esters; and
w) toluene

Conclusion

The health of the public, and specifically humanity's reproductive future, depends on decisive legislative action. We recommend policies that prevent plastic pollution at the source and the establishment of national standards that prohibit the use of known endocrine-disrupting chemicals (EDCs) in foodware and consumer goods and support a transition toward a truly non-toxic, plastic-free reuse economy.

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