

Plastic waste in Australia

And the recycling greenwash

By 2050, the amount of plastic consumed in Australia will more than double. Despite government policies aimed at creating a 'circular economy', just 14% of plastic waste is kept out of landfill. Recycling plastic is inefficient, expensive and hazardous, and there is little demand for recycled plastics. Policies to cap or phase down the use of plastics, including a plastics tax, are needed.

Discussion paper

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Contents

Summary.....	1
Introduction.....	3
Increasing consumption	8
Stagnant levels of plastic recovery	12
Energy recovery.....	15
Biodegradable plastics.....	16
Recycling.....	16
Australia’s existing plastic waste policies.....	21
Domestic policies.....	21
International initiatives	23
Policies to reduce plastic production and consumption	24
Governments.....	24
Plastic packaging tax.....	24
Producer responsibility programs	26
Community groups	27
Households and individuals.....	28
Consumer perspectives on plastic waste	30
Conclusion	32
Appendix.....	34
Method	34
Detailed results.....	35

Summary

Since the year 2000, the total amount of plastic consumed in Australia has more than doubled. It is estimated that by 2049–50, plastic consumption will have increased by a further two-and-a-half times. On a per capita basis, consumption has increased 60% — from an estimated 92 kg per person in 2000, to 148 kg per person in 2020–21. This significant increase in consumption is driving a plastic waste crisis that recycling and recovery attempts have not been able to alleviate. If Australia is to reduce plastic waste, production and consumption will need to decline.

The ‘circular economy’ has come to be seen by many as a silver bullet that will eliminate waste and pollution by keeping materials circulating at a high value at every point of the production, consumption and waste cycle. Reuse and recycling are widely touted as the ‘circular’ solution to plastics waste. But this ignores the reality that recycling plastic is inefficient, expensive and hazardous, and that there is little demand for recycled plastics. The oil industry plans to invest \$400 billion in new petrochemical plants in the expectation that demand for plastics will increase, and a 2021 report found that none of the 100 largest plastic producers procure more than two percent of their feedstock from recyclable sources. Given this, it is hard to see the idea that Australia will recycle our way out of the plastics waste crisis as anything more than greenwashing.

In recent years the Australian Government has released several plans aimed at reducing the amount of plastic waste. These plans include the *2018 National Waste Policy*, the *2019 National Waste Policy Action Plan*, the *Australian Packaging Covenant*, and a goal to recycle or reuse 100% of plastic waste and end plastic pollution by 2040. What is common to all of these policies is that they focus on recovery, particularly recycling, and not on reducing the production and consumption of plastics in the first place.

The inexorable increase in the growth in plastics waste shows that existing policies are not working. Existing approaches to dealing with plastic waste – including energy recovery (using it for fuel), composting, and recycling – are not making a significant contribution to reducing the amount of plastic waste that is created. Only about 15% of all plastic waste generated over the last 20 years has been recovered through recycling, composting or energy recovery.¹ These forms of plastic waste recovery have not kept pace with consumption and waste because they are difficult and costly, and unlikely to ever match current levels of plastic waste.

If Australia is to turn the tide on plastics waste, more effective policies that reduce production and consumption are needed. Policies in other countries show what Australia

¹ Recovered plastic as a portion of all plastic waste generated for years 2000 to 2020–21.

might be able to do. In the European Union, a tax on plastic packaging is expected to generate about €7 billion a year when it is implemented. Given the effectiveness of this tax in Europe, there is every reason to believe a similar policy would help reduce plastic waste in Australia. If Australia applied a tax on plastic packaging at the same rate as the EU, and charged it to plastic producers and importers like Spain does, we calculate that it could raise \$1.5 billion in revenue.

Extended producer responsibility (EPR) schemes are another policy that has shown promise overseas. The UK's EPR scheme for plastics packaging will soon be applied to all businesses with an annual turnover of £1 million and who are responsible for using 25 tonnes of plastic packaging or more. There are also ways in which community groups, households and individuals can help cut the glut of plastics waste polluting Australia, which this paper also discusses.

This report shows that a clear majority of Australians support regulatory and legislative reforms that would reduce plastic waste beyond what currently exists including:

- 85% support for legislated plastic waste reduction targets for producers, suppliers, and retailers
- 80% support for laws phasing out the use of single-use plastics
- 78% support for banning plastic which cannot be recycled in the curbside bin
- 86% support for laws requiring new plastic products to contain recycled plastic material.

In addition, 81% of Australians think that businesses that produce/use plastic packaging are the party most responsible for reducing plastic packaging waste. 74% nominate individual consumers; and just over three in five 63% nominate government.

Introduction

Somewhere in the remote North Pacific Ocean sits the largest accumulation of plastic waste in the world. The Great Pacific Garbage Patch, as it has come to be known, spans 1.6 million square kilometres.² It is twice the size of Texas, three times the size of France,³ and 17 times the size of Tasmania. There are four other areas of the world's oceans where our plastic waste accumulates⁴, including in the South Pacific.⁵ They might be smaller in comparison to the one in the North Pacific, but each one is enormous in its own right.

The Great Pacific Garbage Patch is made up of an estimated total of 1.8 trillion pieces of plastic waste.⁶ This is equivalent to 250 pieces of plastic for every human on the planet.⁷ One study found that between 4.8 and 12.7 million metric tonnes of plastic waste generated on land entered the ocean in 2010, and estimated that this would increase by an order of magnitude by 2025.⁸ It is now thought that, by weight, there could be more plastic than fish in the sea by 2050.⁹

Globally, 32% of plastic packaging escapes collection systems and ends up in the environment.¹⁰ Plastic can be found even in the deepest parts of the ocean, where it represents up to 80% of marine litter, often in the form of microplastics.¹¹ This has a very serious adverse impact on marine life and exacerbates other stresses on ocean health.¹² Plastic pollution kills an estimated one million seabirds and 100,000 sea mammals each

² Lebreton et al (2018) 'Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic', *Scientific Reports*, <https://www.nature.com/articles/s41598-018-22939-w>

³ The Ocean Cleanup (2023) *The Great Pacific Garbage Patch*, <https://theoceancleanup.com/great-pacific-garbage-patch/>

⁴ Ibid.

⁵ Markic et al (2023) 'Microplastic pollution in the intertidal and subtidal sediments of Vava'u, Tonga', *Marine Pollution Bulletin*, <https://www.grida.no/publications/876>

⁶ Lebreton et al (2018) 'Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic' <https://ellenmacarthurfoundation.org/topics/plastics/overview>

⁷ The Ocean Cleanup (2023) *The Great Pacific Garbage Patch*

⁸ Jambeck et al (2015) 'Plastic waste inputs from land into the ocean', *Science*, <https://www.science.org/doi/10.1126/science.1260352>

⁹ Ellen MacArthur Foundation and McKinsey & Company (2016) *The New Plastics Economy – Rethinking the Future of Plastics*, p. 17, <https://www.ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics>

¹⁰ Ibid, p. 15.

¹¹ International Union for Conservation of Nature (2021) *Marine plastic pollution*, <https://www.iucn.org/resources/issues-brief/marine-plastic-pollution>

¹² Wootton et al (2022) 'Microplastic in oysters: A review of global trends and comparison to southern Australia', *Chemosphere*, p 1, <https://www.sciencedirect.com/science/article/pii/S0045653522025589>

year.¹³ While some ocean plastic originates from the sea-based shipping and fisheries industries, most of it comes from land-based sources and is transported via rivers.¹⁴ Once in the ocean, microplastics can act as vectors for toxic chemicals to enter the ecosystem through marine life.¹⁵

For the nearly one million volunteers for *Clean Up Australia Day*, the impact of plastic waste on the environment is clear. Of all rubbish collected in 2022, 63% was plastic waste, which was up 17% from the previous year.¹⁶ The newer items picked up by volunteers — face masks, vapes and RAT tests — reflect how our use of plastic has increased, but the older items — soft plastics, beverage bottles, coffee cups, takeaway food containers, and single-use cutlery and plates — remind us of how persistent plastics waste is.¹⁷

When plastic degrades, it dissolves into imperceptible smaller fragments called microplastics, which filter into the air we breathe, the water we drink, and the food we eat.¹⁸ Microplastics have been found in 94% of oysters globally,¹⁹ and in the gastrointestinal tracts of 62% of fish in Australia.²⁰ A study of microplastics in the Great Australian Bight concluded that about 14 million tonnes of microplastics reside on the ocean floor.²¹

There are serious questions about the effect our heavy use of plastics is having on our health. Plastics have been linked to diseases ranging from cancer to lung disease, birth defects and endocrine toxicity.²² From extraction through to manufacturing, use and disposal, plastic impacts our health.²³ Plastics have been termed a “cocktail of

¹³ United Nations, The Ocean Conference (n.d.) *Factsheet: Marine pollution*,

https://sustainabledevelopment.un.org/content/documents/Ocean_Factsheet_Pollution.pdf

¹⁴ United Nations environment Programme (UNEP) (2021), *Drowning in plastic: Marine litter and plastic waste vital graphics*, https://gridarendal-website-live.s3.amazonaws.com/production/documents/:s_document/867/original/DrowningInPlastics_final.pdf?1634815429

¹⁵ Tan Suet et al (2021) ‘Marine microplastics as vectors of major ocean pollutants and its hazards to the marine ecosystem and humans’, *Progress in Earth and Planetary Science*, <https://doi.org/10.1186/s40645-020-00405-4>

¹⁶ Clean Up Australia (2022) *Rubbish Report 2022*, p 6, <https://www.cleanup.org.au/rubbish-report>

¹⁷ Ibid.

¹⁸ Senathirajah et al (2021) ‘Estimation of the mass of microplastics ingested – A pivotal first step towards human health risk assessment’, *Journal of Hazardous Material*, <https://doi.org/10.1016/j.jhazmat.2020.124004>

¹⁹ Wootton et al (2022) ‘Microplastic in oysters: A review of global trends and comparison to southern Australia’, *Chemosphere*, p 1

²⁰ Wootton et al (2021) ‘A comparison of microplastic in fish from Australia and Fiji’, *Frontiers in Marine Science*, p 1, <https://doi.org/10.3389/fmars.2021.690991>

²¹ Barrett et al (2020) ‘Microplastic pollution in deep-sea sediments from the Great Australian Bight’, *Frontiers in Marine Science*, <https://www.frontiersin.org/articles/10.3389/fmars.2020.576170/full>

²² Landrigan et al (2023) ‘The Minderoo-Monaco Commission on Plastics and Human Health’, *Annals of Global Health*, p 3, <https://annalsofglobalhealth.org/articles/10.5334/aogh.4056/>

²³ Ibid.

contaminants”, due to the fact that they are commonly found along with heavy metals, pesticides and other organic pollutants,²⁴ as well as a range of other chemicals that are designed to give them colour, flexibility, stability and resistance to UV light.²⁵ Many of these additives and contaminants are carcinogenic or neurotoxic, or associated with diseases like obesity and diabetes.²⁶ An estimated 400,000 to 1 million people die each year from diseases related to mismanaged waste including plastic, primarily in the global South.²⁷ Conservative estimates show that humans ingest between 0.1 grams and 5 grams – which is equivalent to an entire credit card’s worth – of microplastics every week.²⁸ Plastic has now even been found in the placentas of newborn babies, as well as in human blood and tissues; a fact that has led to many calling this era of human history ‘The Plasticene’.²⁹

Plastics have “cradle-to-grave” impacts on our environment.³⁰ Because plastics are almost exclusively made from fossil fuels like gas and oil, the manufacture of plastics contributes to climate change.³¹ Approximately 90% of the emissions related to plastics can be attributed to its conversion from fossil fuels.³² In total, about 6% of global oil use – equal to that of the global aviation sector – is consumed by the manufacture of plastics.³³ This figure is projected to rise to 20% of total annual oil consumption by 2050.³⁴ This fact has led some to

²⁴ Senathirajah et al (2021) ‘Estimation of the mass of microplastics ingested – A pivotal first step towards human health risk assessment’, *Journal of Hazardous Material*, p 2, <https://doi.org/10.1016/j.jhazmat.2020.124004>

²⁵ Landrigan et al (2023) ‘The Minderoo-Monaco Commission on Plastics and Human Health’”, p 3, *Annals of Global Health*

²⁶ Senathirajah et al (2021) ‘Estimation of the mass of microplastics ingested – A pivotal first step towards human health risk assessment’

²⁷ Williams, Gower and Green (2019) *No time to waste: Tackling the plastic pollution crisis before it’s too late*, p 5, <https://learn.tearfund.org/-/media/learn/resources/reports/2019-tearfund-consortium-no-time-to-waste-en>

²⁸ Ibid.

²⁹ Campanale et al (2020) ‘A detailed review study on potential effects of microplastics and additives of concern on human health’, *International Journal of Environmental Research and Public Health*, p 1212, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068600/>; Ragusa et al (2021) ‘Plasticenta: First evidence of microplastics in human placenta’, *Environment International Journal*, <https://pubmed.ncbi.nlm.nih.gov/33395930/>

³⁰ Bauman (2019) ‘How plastics contribute to climate change’, *Yale Climate Connections*, <https://yaleclimateconnections.org/2019/08/how-plastics-contribute-to-climate-change/>

³¹ International Energy Agency (2018) *The future of petrochemicals: Towards more sustainable plastics and fertilisers*, p 2, <https://iea.blob.core.windows.net/assets/86080042-1c55-4c37-9c20-d3390aa5e182/English-Future-Petrochemicals-ES.pdf>

³² OECD (n.d.) *Plastic leakage and greenhouse gas emissions are increasing*, <https://www.oecd.org/environment/plastics/increased-plastic-leakage-and-greenhouse-gas-emissions.htm>

³³ Ellen Macarthur Foundation and McKinsey & Company (2016) *The New Plastics Economy – Rethinking the Future of Plastics*, p. 17, <https://www.ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics>

³⁴ Ibid, p .13.

go so far as to label plastic manufacturing the “plan B for the fossil fuel industry”.³⁵ The Minderoo Foundation contends that “oil and gas companies are planning to ‘ride out’ decarbonisation in the transport and energy sectors by redirecting fossil fuels into plastics.”³⁶ This makes plastics a significant source of future global oil and gas demand.³⁷

Despite the increasing damage that plastic does to human health, animals and the wider environment, this report shows that Australia’s consumption of plastic has increased steadily this century, and forecasts are for continued growth. For many years, Australia has dealt with its plastic waste crisis by shipping waste plastic overseas, burning or burying it. This created an ‘out of sight, out of mind’ mentality. But the 2022 collapse of REDcycle,³⁸ which was Australia’s largest soft-plastics recycling scheme, raised important questions about the viability and integrity of plastics recycling, and many of the nations that Australia relied on to take its waste have now introduced laws that ban the importation of waste plastics. This includes China’s ‘National Sword’ policy, which was implemented in early 2018.³⁹ These bans prompted a reassessment of Australia’s plastic waste policies, and resulted in an agreement between government and industry to achieve ambitious targets for the recycling and reuse of plastic waste by 2025. These were set out in the *2025 National Packaging Targets* and the *2019 National Waste Action Plan*.⁴⁰ Yet, despite these targets, recycling rates continued to stagnate, and little progress was made on reducing the volume of plastic waste going to landfill.⁴¹ In 2023 Environment Minister Tanya Plibersek accepted that the targets were unlikely to be met and set a new policy mandate for 100% of plastic to be recycled or reused by 2040 – targets she described as signaling that Australia was

³⁵ Brigham (2022) ‘How the fossil fuel industry is pushing plastics on the world’, *CNBC*, <https://www.cNBC.com/2022/01/29/how-the-fossil-fuel-industry-is-pushing-plastics-on-the-world-.html>

³⁶ The Minderoo Foundation (2021) *The Plastic Waste Makers Index*, p 63, <https://cdn.minderoo.org/content/uploads/2021/05/27094234/20211105-Plastic-Waste-Makers-Index.pdf>

³⁷ International Energy Agency (2018) *The future of petrochemicals*, p 3,

³⁸ Vedelage and Dowling (2022) ‘Coles, Woolworths recycling scheme collapses after secret stockpiles revealed’, *The Age*, <https://www.theage.com.au/national/coles-woolworths-recycling-scheme-collapses-after-secret-stockpiles-revealed-20221107-p5bw9q.html>

³⁹ Wen et al (2021) ‘China’s plastic import ban increases prospects of environmental impact mitigation of plastic waste trade flow worldwide’, *Nature Communications*, <https://doi.org/10.1038/s41467-020-20741-9>

⁴⁰ See Australian Packaging Covenant Organisation (APCO) (2018) *Australia’s 2025 National Packaging Targets*, <https://apco.org.au/national-packaging-targets>; Australian Government (2019) *National Waste Policy Action Plan 2019*, <https://www.agriculture.gov.au/sites/default/files/documents/national-waste-policy-action-plan-2019.pdf>

⁴¹ APCO (2023) *Review of the 2025 National Packaging Targets: Final report*, <https://documents.packagingcovenant.org.au/public-documents/Review%20of%20the%202025%20National%20Packaging%20Targets>

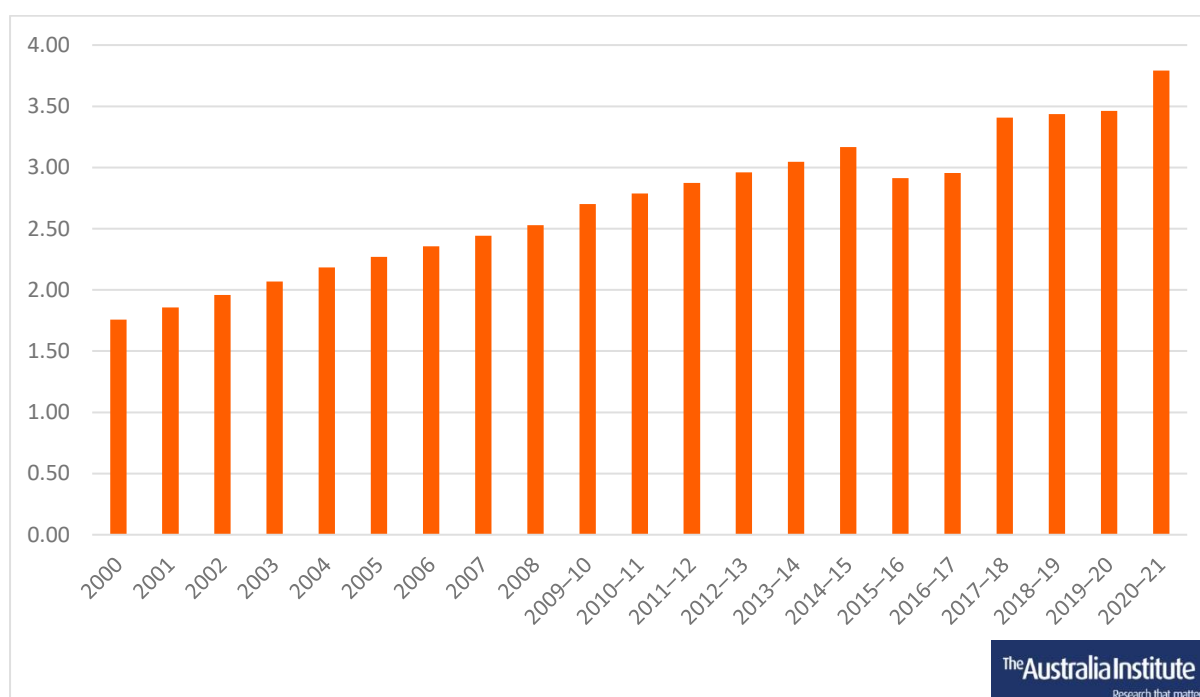
“prepared to be held to account” and “do better” on the problem of plastic waste.⁴² Yet this policy still overwhelmingly relies on increasing recycling as the solution.

⁴² Clure (2022) ‘Australian government pledges to recycle all plastics by 2040’, *ABC News*, <https://www.abc.net.au/news/2022-11-15/australian-government-pledges-to-recycle-all-plastics-by-2040/101655630>

Increasing consumption

Figure 1 shows that, according to the Federal Government's *Australian Plastic Flows and Fates Study 2020–21*, plastic consumption in Australia rose by 116% between 2000 and 2020–21. The study defines consumption as the total use of plastic by Australian industry and consumers, including locally made as well as imported product.⁴³ In the year 2000, Australia consumed 1.79 million tonnes of plastic. By 2020–21, this had risen to 3.79 million tonnes, equivalent to the weight of 72 Sydney Harbour Bridges every year.⁴⁴ This increase is shown in Figure 1:

Figure 1: Consumption of plastic in Australia, 2000 to 2020–21 (million tonnes)



Source: *Australian Plastic Flows and Fates Study 2020–21* (2022)⁴⁵

⁴³ Excludes locally made product exported for sale. See Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2022) *Australian Plastics Flows and Fates Study 2020–21: National report*, p 121, <https://www.dcceew.gov.au/sites/default/files/documents/apff-national-report-2020-21.pdf>

⁴⁴ Authors' calculations (rounded down). Relative to 3.8 million tonnes of plastic waste, the Sydney Harbour Bridge weighs 52,000 tonnes (total weight of the steelwork including arch and steel approach spans). Transport for NSW (2014) *Bridge Facts*, <https://roads-waterways.transport.nsw.gov.au/documents/projects/sydney-inner/sydney-harbour-bridge/bridge-facts.pdf>

⁴⁵ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21: National report*, p 2, <https://www.dcceew.gov.au/sites/default/files/documents/apff-national-report-2020-21.pdf>

The total amount of plastic consumed over the 21 years depicted in Figure 1 is 56.9 million tonnes, equivalent to the weight of more than 1,000 Sydney Harbour Bridges.⁴⁶ The slight year-on-year decrease in plastic consumption between 2015–16 and 2016–17 is worth noting. The likely cause of this temporary reduction, according to the *2016 National Waste Report*, is the phase-in of lightweighting technology.⁴⁷ This approach involves reducing the amount of plastic used in a given package in order to reduce the per item plastic content. This technique is used extensively in the manufacture of plastic bottles, which have been thinned to reduce plastic content.⁴⁸ However, this technological advancement only resulted in a temporary reduction in consumption, which continued to increase again from 2017–18.

Figure 2 shows that plastic consumption has also grown on a per capita basis – from an estimated 92 kg per person in 2000 to 148 kg per person in 2020–21.⁴⁹ This is a 60% increase in 20 years.⁵⁰

⁴⁶ Transport for NSW (2014) *Bridge Facts*

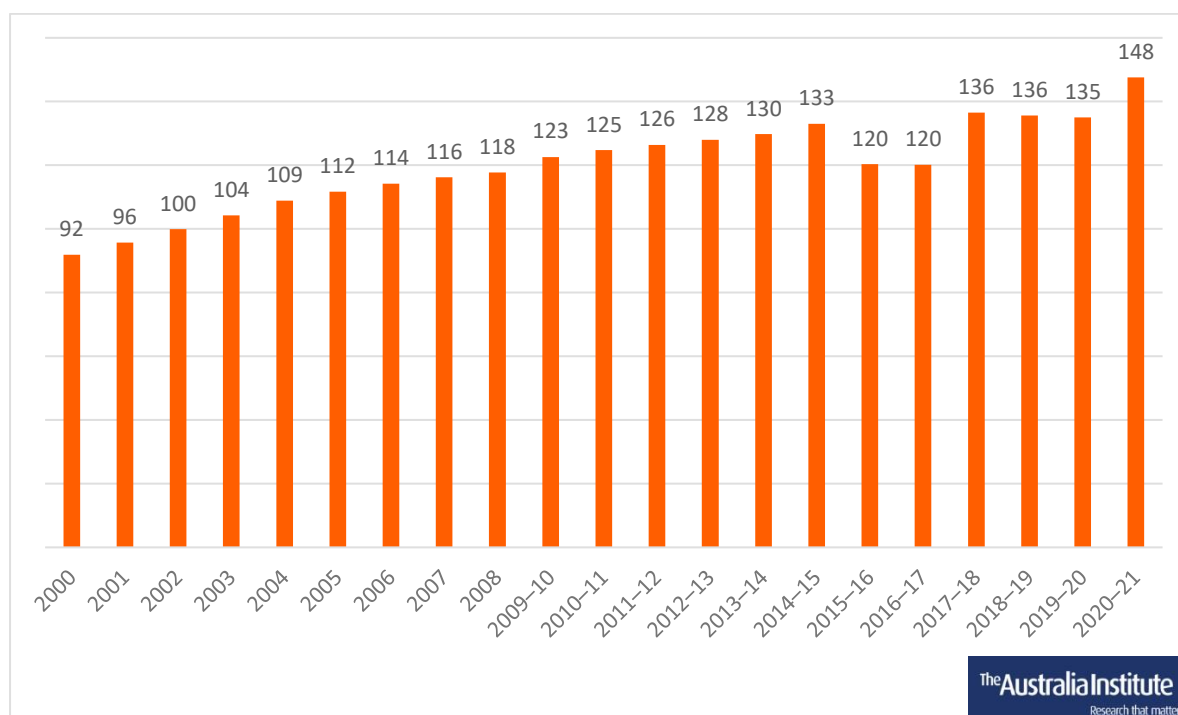
⁴⁷ DCCEEW (2016) *Australian national waste report 2016*, p 23,
<https://www.dcceew.gov.au/sites/default/files/documents/national-waste-report-2022.pdf>

⁴⁸ Inside Packaging (n.d.) *A weight-loss program for plastic packaging*, https://inside-packaging.nridigital.com/packaging_jul20/lightweighting_plastic

⁴⁹ Author's calculations from *Australian Plastics Flows and Fates Study* data. Total weight of plastic consumption at a given year divided by total population at that year gives this figure.

⁵⁰ Author's calculations from *Australian Plastics Flows and Fates Study* data. Difference in per capita consumption (kg) between 2000 and 2020–21 as a percentage of per capita consumption (kg) in 2000.

Figure 2: Australian plastic consumption per capita (kilograms per person)



Source: Australian Plastic Flows and Fates Study 2020–21 (2022); ABS National, state and territory population Australia, estimated resident population (Financial year or end of year population)⁵¹

The causes of increased plastic consumption are varied. First, there has been an exponential increase in the quantity of plastic products, partly driven by the proliferation of new packaging types and single-use plastics.⁵² Second, plastics have come to be incorporated into a range of new products. To pick up on just one example, synthetic fibres made from plastic are now estimated to make up 60% of all clothing.⁵³ As clothing production doubled between 2000 and 2015, so too did plastics consumption through synthetic feedstocks.⁵⁴ Third, fossil fuel feedstocks remain far cheaper than recyclable plastic feedstocks, meaning that there is little or no economic incentive for manufacturers to move to these more sustainable options.⁵⁵ And last, there has been little regulation of plastic production, meaning that the industry has continued to grow largely without restriction.⁵⁶ This trend in consumption shows no sign of abating.

⁵¹ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21: National report*, p 2; ABS (2023) *National, state and territory population*, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/jun-2023>

⁵² Minderoo Foundation (2021) *The Plastic Waste Makers Index*, p 21

⁵³ UNEP (n.d.) *Fashion's tiny hidden secret*, <https://www.unep.org/news-and-stories/story/fashions-tiny-hidden-secret>

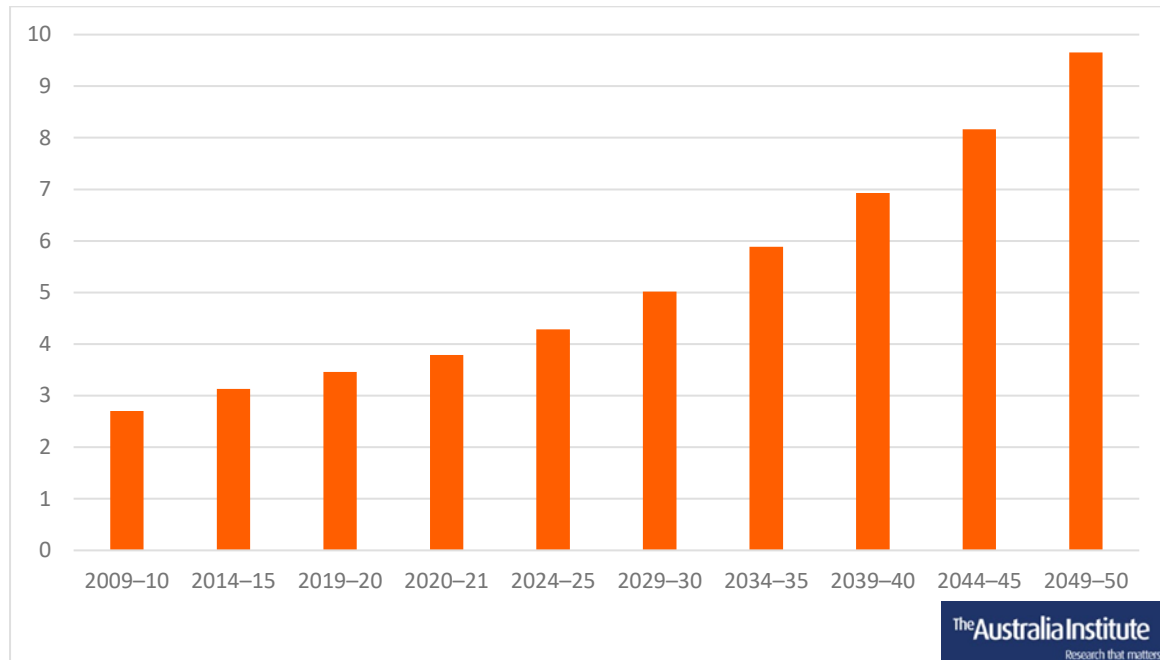
⁵⁴ Ellen Macarthur Foundation (2017) *A new textiles economy: Redesigning fashion's future*, p 18, <https://www.ellenmacarthurfoundation.org/a-new-textiles-economy>

⁵⁵ Minderoo Foundation (2021) *The Plastic Waste Makers Index*, p 21

⁵⁶ *Ibid.*

The *Australian Plastic Flows and Fates Study* estimates that by 2049–50, plastic consumption will increase by 155% (compared to 2020–21 figures), to 9.7 million tonnes per annum, as shown in Figure 3 below:

Figure 3: Projected Australian plastics consumption 2009–10 to 2049–50 (million tonnes)



Source: *Australian Plastic Flows and Fates Study 2020–21 (2022)*⁵⁷

To put the data in Figure 3 into perspective, Australia’s plastic consumption is expected to increase more than two-and-a-half times – from 72 Sydney Harbour Bridges per year in 2020–21 to 185 bridges per year in 2049–50.⁵⁸ Consumption is also expected to grow on a per capita basis over the next 30 years: from 147 kg per person in 2020–21 to 260 kg in 2049–50.⁵⁹ This means that, according to the government’s own projections, each person is expected to consume 77% more plastic by 2049–50.⁶⁰

The significant increase in our consumption of plastics is driving the plastic waste crisis. If Australia is to reduce plastic waste, it must reduce plastic consumption. As the following sections show, efforts to recycle or recover plastic after its initial use have proven to be ineffective. The evidence suggests that the problem must be tackled at the source.

⁵⁷ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21: National report*, p 34

⁵⁸ The Sydney Harbour Bridge (total weight of the steelwork including arch and steel approach spans) weighs 52,000 tonnes. Transport for NSW (2014) *Bridge Facts*

⁵⁹ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21*, p 31; Author’s calculations from *Australian Plastics Flows and Fates Study* data. Difference in per capita consumption (kg) 2020–21 to 2049–50 as a percentage of per capita consumption (kg) in 2020–21.

⁶⁰ Ibid.

Stagnant levels of plastic recovery

While some plastic remains in use by consumers for many years – in furniture, cars, electronics and a host of other longer-lasting products – most plastic is discarded soon after it is purchased. Single-use plastics, which are on the most extreme end of this scale, make up over one-third of plastic produced worldwide.⁶¹

The amount of plastic waste⁶² that Australia generates is set to significantly increase, and by 2049–50 will reach a massive 146 kg per person.⁶³ This waste either ends up as landfill, goes into waste incineration,⁶⁴ or is ‘recovered’ through recycling,⁶⁵ energy recovery,⁶⁶ or composting.⁶⁷ Recovery through these methods is often touted as the solution to the plastic waste problem, but the reality of plastics recovery is much more complicated. Despite concerted government efforts, recovery diverts just a fraction of plastic waste from landfill or waste incineration.

Figure 4 below compares Australia’s annual consumption of plastic with the amounts that are disposed and recovered. The increasing volumes of plastic waste sent for disposal closely follow the increase in consumption, while the amount recovered has continued to lag far behind.

⁶¹ The Minderoo Foundation (2021) *The Plastic Waste Makers Index*, p 11

⁶² Defined as “any discarded, rejected, unwanted, surplus or abandoned matter, including where intended for recycling, reprocessing, recovery, purification or sale”. *Ibid.*, p 127.

⁶³ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21*, p 38

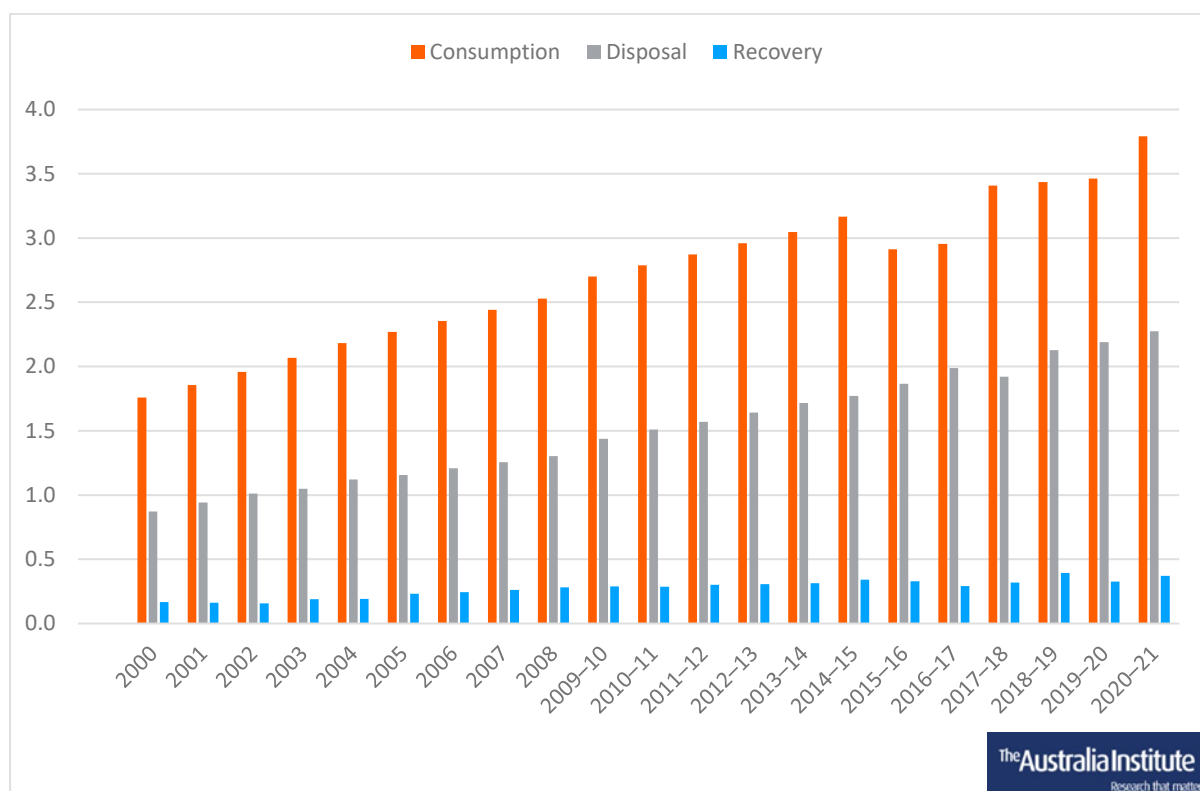
⁶⁴ The deposit of solid waste into an incinerator, excluding waste that is sent to energy recovery. Incineration results in the destruction of waste material through burning. *Ibid.*, p 122

⁶⁵ Defined as the process by which solid wastes are collected, sorted, processed, and converted into raw materials to be used in the production of new products. This excludes energy recovery and stockpiles. *Ibid.*, p 126.

⁶⁶ Defined as the combustion of waste plastics as either a fuel substitute or in specialised waste combustion facilities to create heat. *Ibid.*, p 122

⁶⁷ Defined as biodegradable bioplastic-based articles that degrade and meets the requirements of the Australian Standards for commercial composting and/or home composting. *Ibid.*, p 121

Figure 4: Waste generation and recovery of plastic in Australia (million tonnes)



Source: Australian Plastic Flows and Fates Study 2020–21 (2022)⁶⁸

Figure 4 shows that Australia has consumed a total of 56.9 million tonnes of plastic since 2000. More than half of this – 31.9 million tonnes – has been disposed of, while just 5.8 million tonnes have been recovered.⁶⁹ That means that only about 15% of all plastic waste generated over the last 20 years has been recovered through recycling, composting or energy recovery.⁷⁰

Recovery has not kept pace with the increase in waste. As shown in Figure 5 below, only 14% of plastic waste generated in 2020–21 was recovered – this is a decline from a high of nearly 18% in 2008.⁷¹ Over a 20-year period the rate of recovery has, at best, remained stable, and at worst – as an Australian Government report states – is “even trending

⁶⁸ Adding the volumes of plastic disposed of and recovered gives the total amount of plastic waste generated per year. Note that the amount of plastic waste generated per year lags behind consumption rates, because plastics vary in their lifespan. This is why the quantity of plastic waste generated is not equivalent to the amount consumed each year. DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020-21*, p 2

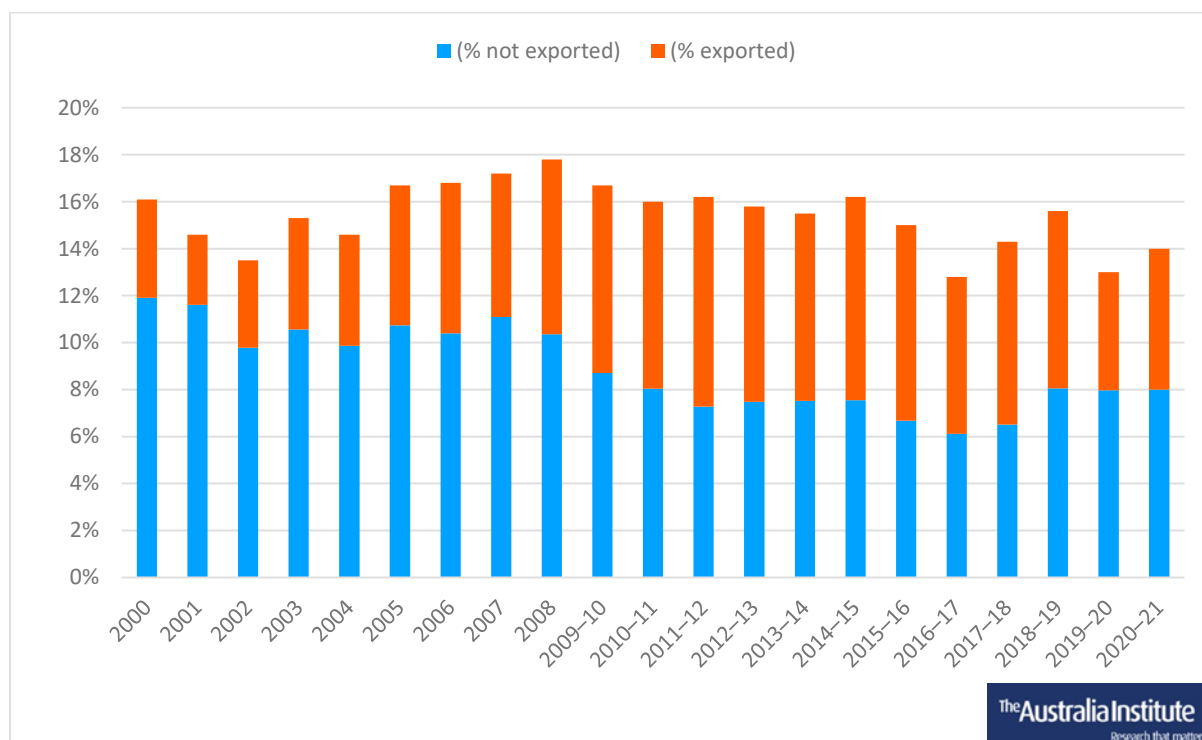
⁶⁹ Authors calculations, total recovered, consumed, and disposed plastic for years 2000 to 2020-21.

⁷⁰ Authors calculations, recovered plastic as a portion of all plastic waste generated for years 2000 to 2020–21.

⁷¹ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020-21*, p 2

down”.⁷² These results mirror that of global plastic recovery. Only 9% of global plastic waste was recycled in 2019, a figure expected to rise to just 17% by 2060.⁷³

Figure 5: Recovery rate of plastic waste in Australia 2000 to 2020–21 (%)



Source: Australian Plastic Flows and Fates Study 2020-21 (2022)⁷⁴

Notably, this figure includes not only plastic waste that is recovered domestically, but also that which is exported for processing in other countries. The percentage of total recovered waste that is exported has been trending down – from a high of 55% in 2011–12, to 43% in 2020–21.⁷⁵ Regardless of this trend, the amount of plastic waste exported still remains very high. Although the Australian Government introduced a ban on exporting plastic waste in July 2021,⁷⁶ in 2023 the government approved the export of 20,000 tonnes of plastic because of our limited domestic recycling capacity.⁷⁷ This suggests that the policy is a ‘ban’

⁷² Ibid.

⁷³ OECD (2019) *The current plastics lifecycle is far from circular*, <https://www.oecd.org/environment/plastics/plastics-lifecycle-is-far-from-circular.htm>

⁷⁴ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020-21*, p 2-3

⁷⁵ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21*, pp 24–25

⁷⁶ The Recycling and Waste Reduction Bill 2020, https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r6573

⁷⁷ Elks (2023) ‘Australia to export 20,000 tonnes of plastic, instead of recycling onshore’, *The Australian*, <https://www.theaustralian.com.au/nation/politics/australia-to-export-20000-tonnes-of-plastic-instead-of-recycling-onshore/news-story/161100aafb99e80172bb6ff9801f25d>

in name only. This came after China's 2018 ban on the importation of plastic waste.⁷⁸ The impact of these more-recent domestic policies is not yet evident in the data.

So why has plastic recovery not kept pace with consumption and waste? To put it simply, plastic recovery is difficult and costly. It is unlikely to ever match current levels of plastic waste.

ENERGY RECOVERY

About 10% of plastic recovery in Australia can be attributed to plastic waste that is converted to energy.⁷⁹ This is mostly in the form of 'processed engineered fuel', which is commonly used for combustion in cement kilns.⁸⁰ This has been called a "practical and sustainable alternative to the use of fossil fuels".⁸¹ But while energy recovery from plastic has been branded a sustainable alternative to fossil fuels by industry, environmental organisations have generally disagreed. The *Ellen MacArthur Foundation*, for example, contends that "while some one-time extra value is gained from the product in the form of energy, the materials are then lost from the economy, which means new virgin materials are needed to produce the next generation of products".⁸² To put it simply, plastic is made from oil and gas, so burning it simply replaces one fossil fuel product with another – albeit one that goes via another route first as plastics. This means that waste-to-energy does not move us away from what is ultimately a fossil fuel economy.

Furthermore, research suggests that waste-to-energy is not simply a 'neutral' replacement to conventional fossil-fuel based power systems, but one that is actually more polluting. Researchers found that "the CO₂ emissions generated from plastic waste-to-energy systems are higher than those from current fossil fuel-based power systems per unit of power generated".⁸³ The environmental costs associated with incineration do not stop at greenhouse gas emissions. Plastic waste incinerators have been found to release toxic air pollution associated with a high risk of cancer.⁸⁴ Incineration is an environmentally costly

⁷⁸ Wen et al (2021) 'China's plastic import ban increases prospects of environmental impact mitigation of plastic waste trade flow worldwide', *Nature Communications*, <https://doi.org/10.1038/s41467-020-20741-9>

⁷⁹ Out of 371,300 tonnes of recovered plastic, 37,300 tonnes were sent to energy recovery. That gives a rate of 10% of all plastics recovered. DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020-21*, p 1

⁸⁰ Blue Environment (2022) *National waste report 2022*, pp 56–57

⁸¹ Australasian Waste and Recycling Expo (2018) *Processed engineered fuel*, <https://awre.com.au/recycling/processed-engineered-fuel>

⁸² Ellen MacArthur Foundation (n.d.) *Plastics and the circular economy*, <https://ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive>

⁸³ Kwon et al (2023) 'Nonviable carbon neutrality with plastic waste-to-energy', *Energy and Environmental Science*, <https://pubs.rsc.org/en/content/articlelanding/2023/ee/d3ee00969f/unauth>

⁸⁴ Lerner (2023) 'This 'climate-friendly' fuel comes with an astronomical cancer risk', *The Guardian*, <https://www.theguardian.com/environment/2023/feb/23/climate-friendly-us-program-plastics-fuel-cancer>

way to deal with the glut of plastic waste, and one that may be worse than existing alternative solutions.

BIODEGRADABLE PLASTICS

There is an increasing range of ‘bio-based plastics’, which claim to be ‘biodegradable’ or ‘compostable’. Although these products are becoming more common, they still represent a negligible portion of overall plastic consumption. While consumers readily assume that products advertised as compostable or biodegradable decompose in an environmentally-friendly way, this is not always the case.⁸⁵ Claims of biodegradability or compostability are based on ideal levels of moisture, oxygen, temperature and UV exposure that are often not met in reality. As such, many plastics labelled ‘compostable’ will only do so under ideal, industrial composting conditions. Of the 3.8 million tonnes of plastic consumed annually in Australia, just 9,800 tonnes is certified as compostable by the Australian Government – just 0.3%.⁸⁶ Biodegradable plastics also can contain toxic additives that cause harm to marine life if they are improperly discarded.⁸⁷ A recent study found that “most home compostable plastics don’t work” because they had failed to break down over a six-month period.⁸⁸ The lead author of the study, Professor Mark Miodownik, concluded that we should not pretend that composted plastic is going to be some sort of panacea.⁸⁹ Furthermore, an over-reliance on composting would see the disposal of single-use materials continue, and do little to encourage the reduction and reuse of raw materials.

RECYCLING

About 12.6% of Australia’s plastic waste is recycled.⁹⁰ This means that recycling accounts for about 90% of total plastic recovery.⁹¹ In the recycling process, waste plastic is collected, sorted and processed to produce new products. Proponents of recycling argue that this eliminates the need for ‘virgin’ plastic feedstocks made from fossil fuels. But it is much more

⁸⁵ UTS (2021) ‘Biodegradable’ plastic will soon be banned in Australia, <https://www.uts.edu.au/news/social-justice-sustainability/biodegradable-plastic-will-soon-be-banned-australia>

⁸⁶ Author’s calculations, composted plastic as a portion of all plastic consumption. Department of Climate Change, Energy, the Environment and Water (2022) *Australian Plastic Flows and Fates Study 2020-21*, p 115

⁸⁷ GRID-Arendal (2021) Drowning in plastics, https://gridarendal-website-live.s3.amazonaws.com/production/documents/s_document/867/original/DrowningInPlastics_final.pdf?1634815429

⁸⁸ Weston (2022) “It’s greenwash: Most home compostable plastics don’t work, says study”, *The Guardian*, <https://www.theguardian.com/environment/2022/nov/03/greenwash-home-compostable-plastics-dont-work-aoe>

⁸⁹ *Ibid.*

⁹⁰ DCCEEW (2022) *Australian Plastics Flows and Fates Study 2020–21*, p 1

⁹¹ Author’s calculations. Recycled plastic as a portion of all recovered plastic.

difficult to recycle plastics than is often assumed. A recent *Greenpeace* report lists a number of challenges:

1. Plastic is difficult to collect.
2. Mixed plastic waste cannot be recycled together.
3. Plastic recycling is wasteful, polluting and a fire hazard.
4. Recycled plastic carries a toxicity risk.
5. Recycling causes microplastics to be shed into the environment.
6. Plastic recycling is not economical and depends on extensive taxpayer-funded programs.⁹²

There are thousands of different types of plastic, and they cannot be recycled together.⁹³ This is particularly challenging in the case of composite plastic items. For example, many PET bottles have HDPE lids, and the two cannot be recycled together, so they must be separated prior to recycling.⁹⁴ Even small levels of contaminants can degrade the quality of an entire batch of recycled plastic.⁹⁵ Colourants pose an additional challenge. Coloured bottles, for example, cannot be recycled alongside clear bottles. This is one reason why Coca-Cola recently changed their Sprite bottles from green to clear plastic.⁹⁶

Other technological, economic, and environmental limitations mean there is significant variation between the recyclability of different plastics. Soft plastics, for example, are avoided by many mainstream recyclers because they pose sorting issues and can clog machinery. As a result, where recycling rates for rigid plastics in Australia sit at 26%, recycling rates for flexible plastics are only 7%.⁹⁷

PVC is another example of a difficult-to-recycle plastic. PVC is one of four most consumed plastics in Australia.⁹⁸ It is used for a variety of applications, including in building and construction as piping, cladding, decking, and as wire and cable insulation.⁹⁹ Producers

⁹² Greenpeace (2022) *Circular claims fall flat again: 2022 update*, p 18-21

https://www.greenpeace.org/usa/wp-content/uploads/2022/10/GPUS_FinalReport_2022.pdf

⁹³ *Ibid*, p 19

⁹⁴ Pooraka Bottle and Can Recycling Centre (2022) *Why remove lids from plastic bottles*,

<https://www.recyclingdepotadelaide.com.au/why-remove-lids-from-plastic-bottles>

⁹⁵ DeWeerd (2022) 'Why it's so hard to recycle plastic', *Scientific American*

<https://www.scientificamerican.com/article/why-its-so-hard-to-recycle-plastic/>

⁹⁶ Coca-Cola (2023) *Sprite's iconic green bottles go clear in Australia, making them easier to recycle in local PET recycling plants*, <https://www.coca-colacompany.com/au/news/sprite-green-bottles-go-clear>

⁹⁷ APCO (2023) *Review of the 2025 National Packaging Targets*, p 15,

<https://documents.packagingcovenant.org.au/public-documents/Review%20of%20the%202025%20National%20Packaging%20Targets>

⁹⁸ By weight. CSIRO (2022) *Saving PVC from landfill*,

<https://www.csiro.au/en/news/all/articles/2022/march/pvc-recycling>

⁹⁹ British Plastics Federation (2023) *Polyvinyl Chloride PVC*,

<https://www.bpf.co.uk/plastipedia/polymers/PVC.aspx#>

commonly advertise PVC as being 100% recyclable, but it is one of the least recycled plastics in Australia.¹⁰⁰ This is because PVC often has high levels of contamination (for example, with lead), because it is difficult to collect and transport, and because demand for the recycled product is low.¹⁰¹

An additional problem is that plastic recycling creates pollution through the shedding of microplastics. Recycling produces microplastics, which end up in the environment through wastewater or sludge from processing plants.¹⁰² Research has found that large quantities of microplastics are generated in the recycling process, and that, as a result, recycling centres are likely to be “a major point source of microplastics pollution”.¹⁰³

Many plastics that are recycled do not go into the production of the same or similar products but are instead ‘downcycled’. Most recycled plastics are made into lower-quality, lower-value products such as park benches and composite material for roads.¹⁰⁴ Recycled plastic bottles, cups and takeaway containers generally cannot be made into new food-grade packaging because many recycled plastics carry a toxicity risk.¹⁰⁵ Plastic commonly absorbs not only toxic chemicals created in the recycling process, but also may have come into contact with toxic chemicals throughout its lifecycle. As environmental chemist Dr Charlotte Lloyd has stated, this creates, “the potential for a cocktail of chemicals, none of which will be removed by the recycling process” to be present in recycled plastics.¹⁰⁶ Furthermore, there are limits on how many times plastic can be recycled because it degrades each time it goes through the process. Just 1% of plastic has been recycled more than once.¹⁰⁷ These difficulties are exemplified in the collapse of Australia’s REDcycle scheme, which collected soft plastics at most Australian supermarkets. At the height of the scheme, collection volumes reached five million pieces of soft plastic per day.¹⁰⁸ But the difficulties in recycling all this material overwhelmed the scheme. Supply soon exceeded

¹⁰⁰ CSIRO (2022) *Saving PVC from landfill*

¹⁰¹ Schuyler, Walton and Farbotko (2022) *PVC Recycling in Australia*, p 5-6, https://ecos.csiro.au/wp-content/uploads/2022/02/21-00506_OA_REPORT_PVCRecycling_WEB.pdf

¹⁰² Suzuki et al (2022) ‘Mechanical recycling of plastic waste as a point source of microplastic pollution’, *Environmental Pollution*, <https://doi.org/10.1016/j.envpol.2022.119114>

¹⁰³ Ibid.

¹⁰⁴ DeWeerd (2022) ‘Why it’s so hard to recycle plastic’, *Scientific American*, <https://www.scientificamerican.com/article/why-its-so-hard-to-recycle-plastic/>

¹⁰⁵ Lloyd (2023) ‘Toxins hidden in plastics are the industry’s dirty secret – recycling is not the answer’, *The Guardian*, <https://www.theguardian.com/commentisfree/2023/may/25/toxins-in-plastics-industrys-dirty-secret-recycling-not-answer>; Rung et al (2023) ‘Identification and Evaluation of (Non-)Intentionally Added Substances in Post-Consumer Recyclates and Their Toxicological Classification’, *Recycling*, <https://doi.org/10.3390/recycling8010024>

¹⁰⁶ Ibid.

¹⁰⁷ Geyer, Jambeck and Law (2017) ‘Production, use, and fate of all plastics ever made’, *Science Advances*, p. 3, <https://doi.org/10.1126/sciadv.1700782>

¹⁰⁸ Secombe (2023) ‘The soft-plastics recycling debacle’, *The Saturday Paper*, <https://www.thesaturdaypaper.com.au/news/environment/2023/04/15/the-soft-plastics-recycling-debacle>

demand for the kinds of products – such as shopping trolleys, street furniture and asphalt road builder – that can be made from downcycled soft plastics.¹⁰⁹ As a result the company began stockpiling plastic as early as 2018. The Environmental Protection Agency are still struggling to deal with the environmental fallout from the failure of this scheme. Now, without any recycler available, soft plastics in Australia are essentially unrecyclable. However, it is worth noting that even at REDcycle’s height, it collected less than 5% of soft plastic waste.¹¹⁰

That REDcycle ran into so much trouble lays bare the limitations of plastics recycling in Australia. It was unrealistic for Australia’s consumers, retailers and their suppliers to expect one small business to solve the entire country’s soft plastic waste problem. There was little demand for the company’s end products and limited support from industry. As the Boomerang Alliance’s Jeff Angel puts it, the failure of REDcycle was testimony to the “superficial effort that the packaging industry was putting into plastic recycling” – not just of REDcycle’s mismanagement.¹¹¹

Despite the problems that plague the recycling industry, many insist that a global uptick in recycling is just around the corner. But although the plastics industry talks up recycling as a solution¹¹², it is betting against this as it continues to invest heavily in the production of virgin plastics. In anticipation that demand for virgin fossil-fuel based plastics will accelerate, the plastics industry plans to invest \$400 billion into new petrochemical plants.¹¹³ A 2021 *Minderoo Foundation* report found that none of the 100 largest plastic producers procure more than two percent of their feedstock from recyclable sources.¹¹⁴ The report described this pace of transition as “moving at a glacial speed”.¹¹⁵ ExxonMobil is planning to increase its virgin plastic production capacity by 35%, Sinopec is planning for a 36% boost, PetroChina a 38% boost, and SIBUR a massive 240% boost to production.¹¹⁶ This is no coincidence: many of the largest companies that produce plastic also produce oil, so they have a strong economic and logistical incentive to keep using virgin feedstocks.

¹⁰⁹ Ibid.

¹¹⁰ Soft Plastics Taskforce (2023) Roadmap to Restart, p 23, <https://www.woolworthsgroup.com.au/content/dam/www/sustainability/documents/Taskforce%20Roadmap%20-%20Final%20v2.docx.pdf>

¹¹¹ Seccombe (2023) “The soft-plastics recycling debacle”, *The Saturday Paper*

¹¹² For example, plastics industry representative Steve Russell recently told an NPR and Frontline investigation that the industry remained committed to ensuring all plastic would be recycled. See NPR and Frontline (2020) *How big oil misled the public into believing plastic would be recycled*, <https://www.npr.org/2020/09/11/897692090/how-big-oil-misled-the-public-into-believing-plastic-would-be-recycled>

¹¹³ Bond, Benham, Vaughan, and Chau (2020) ‘The Future’s Not in Plastics’, *Carbon Tracker*, p. 39, <https://carbontracker.org/reports/the-futures-not-in-plastics/>

¹¹⁴ Minderoo Foundation (2021) *The Plastic Waste Makers Index*, p 36

¹¹⁵ Ibid, p. 37

¹¹⁶ Ibid., p 36

This increased investment in production undermines the argument that plastics can be recycled. As the Centre for International Environmental Law puts it: “... we can’t accept in good faith that [plastics companies] are trying to address the pollution problem ... [while they are] announcing investments of billions of dollars in new plastic production buildout.”¹¹⁷ This is like the fossil fuel industry saying it supports decarbonising the economy while building new coal and gas. How can recycling be a genuine solution to the plastics problem when the very companies strongly advocating for it are heavily investing in virgin plastic manufacturing?

¹¹⁷ Waste 360 (2023) *How are petrochemical companies doing in shifting from virgin plastic?*, <https://www.waste360.com/plastics/how-are-petrochemical-companies-doing-shifting-virgin-plastic>

Australia's existing plastic waste policies

DOMESTIC POLICIES

Australia's overall approach to the plastic waste crisis is that plastic should be diverted and recovered from landfill and be reused as part of a 'circular economy'. But, as the data presented above shows, this has not been effective so far, and forward estimates are not promising either.

A useful place to start this discussion of Australian plastic waste policy is 2017, when China introduced its ban on waste imports.¹¹⁸ This change prompted state and federal governments to deliver the *2018 National Waste Policy* and the attendant *2019 National Waste Policy Action Plan*. The latter set out a number of specific timeframes and targets for addressing the plastic waste crisis. These included:

- a ban on the export of plastic waste, beginning in 2020
- significantly increasing the use of recycled content by governments and industry
- phasing out problematic and unnecessary plastics by 2025
- making comprehensive, economy-wide and timely data publicly available.¹¹⁹

In addition, the *Australian Packaging Covenant* – an industry-led government agreement to reduce plastic waste – set a series of complementary targets, including:

- 100% of packaging to be reusable, recyclable or compostable by 2025
- recycle or compost 70% of plastic packaging by 2025
- achieve 50% average recycled content in packaging by 2025.¹²⁰

After a review found that the 2025 targets were unlikely to be met,¹²¹ the Australian government set a new goal: to recycle or reuse 100% of plastic waste and end plastic pollution by 2040.¹²²

¹¹⁸ Wen et al (2021) 'China's plastic import ban increases prospects of environmental impact mitigation of plastic waste trade flow worldwide', *Nature Communications*, <https://doi.org/10.1038/s41467-020-20741-9>

¹¹⁹ Australian Government (2019) *National Waste Policy Action Plan*, p 2

¹²⁰ DCCEEW (2023) *Australian Packaging Covenant Organisation*, <https://www.dcceew.gov.au/environment/protection/waste/packaging/packaging-covenant>

¹²¹ Readfern (2023) 'Australia recycles just 18% of plastic packaging and will not reach 2025 target, review finds', *The Guardian*, <https://www.theguardian.com/australia-news/2023/apr/20/australia-recycles-just-18-of-plastic-packaging-and-will-not-reach-2025-target-review-finds>

¹²² Clure (2022) 'Australian government pledges to recycle all plastics by 2040', *ABC News*

What is common to all of these policies is that they focus on recovery, particularly recycling, and not on reducing consumption of plastics in the first place. Where reducing consumption is mentioned, it is limited to specific uses. For example, the 2021 National Plastics Plan states:

The simplest way to reduce plastic waste and pollution is to avoid using unnecessary and problematic plastics. Several state and territory governments have already taken successful steps to ban specific problematic single-use plastics. The Australian Government will work with states and territories to align these bans where practical. [bold in original]¹²³

Work towards the 2021 plan includes several seemingly worthwhile initiatives such as:

- phase outs of particular kinds of food and beverage packaging
- a ‘plastic free beaches’ initiative focusing on businesses near ‘Australia’s favourite beaches’
- encouraging better product design
- national packaging targets.¹²⁴

More recent initiatives include a \$60 million grants program to modernise plastic recycling.¹²⁵

But none of these goals address the bigger issue of overall plastic consumption. As demonstrated above, Australia’s plastic consumption is set to increase 2.5-fold between 2020-21 and 2049-50, adding another 113 Sydney Harbour Bridge’s worth of plastic waste to our already overwhelmed recycling and recovery facilities. In other words, it is plastic consumption that drives plastic waste, not the perpetually-underperforming plastic recycling industry.

In other words, plastic policy in Australia has historically focused more on increasing recycling rather than reducing consumption. But the problem is that there is too much plastic and, as this research makes clear, we cannot recycle ourselves out of the problem. Reducing plastic consumption needs to be an explicit policy goal if waste is to be reduced.

¹²³ Department of Agriculture, Water and the Environment (2021) *National Plastics Plan*, <https://www.dcceew.gov.au/environment/protection/waste/plastics-and-packaging/national-plastics-plan>

¹²⁴ DCCEEW (2022) *Prevention—addressing plastics at the source*, <https://www.dcceew.gov.au/environment/protection/waste/plastics-and-packaging/national-plastics-plan/prevention#industry-shift-to-easily-recyclable-plastics>

¹²⁵ DCCEEW (2023) *The RMF Plastics Technology stream*, <https://www.dcceew.gov.au/environment/protection/waste/how-we-manage-waste/recycling-modernisation-fund/plastics-technology-stream#transcript>

INTERNATIONAL INITIATIVES

Whatever Australia might do, plastic waste is a global crisis that will require global solutions. Plastic production is highly concentrated – 20 major producers are responsible for 55% of waste globally, and none of them are based in Australia.¹²⁶ The environmental impacts of plastic waste are not contained within national borders. A good illustration of this is the fact that, despite contributing less than 1.3% of marine plastic waste, Pacific Island nations are disproportionately affected by marine plastic pollution.¹²⁷ This is especially problematic given the dependence of Pacific countries on the marine environment. The region is also marred by an absence of adequate infrastructure to manage high amounts of plastic waste.¹²⁸

There are currently global efforts to forge a global anti-plastics treaty through the United Nations Environment Assembly.¹²⁹ However, the initiative has been marred by the central question of whether the treaty should aim for more recycling and recovery, or a cap on plastic production and consumption. As this paper has shown, the latter is the only realistic option, as recovery can only get us so far.

Internationally, Australia has joined the High Ambition Coalition to End Plastic Pollution, which aims to “end plastic pollution by 2040”.¹³⁰ Tanya Plibersek recently reiterated this commitment, announcing that she would like to see a “plastic-free Pacific in [her] lifetime”.¹³¹ She also promised to provide support to the Cleaner Pacific 2025 Strategy to improve waste management, and \$16 million to invest in the Pacific Regional Marine Litter Action Plan, which aims to ban and develop sustainable alternatives to single-use plastics, and to create public information campaigns.¹³²

¹²⁶ Mindereroo Foundation (2023) *Plastic Waste Makers Index*

¹²⁷ Bergin, (2022), ‘The Pacific’s active role in global negotiations on a marine plastics treaty’, *The Strategist*, <https://www.aspistrategist.org.au/the-pacifics-active-role-in-global-negotiations-on-a-marine-plastics-treaty/>

¹²⁸ Markic et al. (2023), ‘Microplastic pollution in the surface waters of Vava’u, Tonga’, *Marine Pollution Bulletin*, <https://www.grida.no/publications/872>

¹²⁹ UN Environment Programme (2023) *Third session of negotiations on a global plastics treaty opens in Nairobi*, <https://www.unep.org/news-and-stories/press-release/third-session-negotiations-global-plastics-treaty-opens-nairobi>

¹³⁰ High Ambition Coalition to End Plastic Pollution (2023) *End plastic pollution by 2040*, <https://hactoendplasticpollution.org/>

¹³¹ Marks (2023) ‘The battle for an anti-plastics treaty’, *The Saturday Paper*, <https://www.thesaturdaypaper.com.au/news/environment/2023/06/03/the-battle-anti-plastics-treaty>

¹³² Secretariat of the Pacific Regional Environment Programme (SPREP) (2022), *Australia commits to plastic-free Pacific*, <https://www.sprep.org/news/australia-commits-to-plastic-free-pacific>

Policies to reduce plastic production and consumption

The only effective way to tackle plastic pollution is to reduce production and consumption. However, current policies do not include measures to cap or phase down the production and consumption of plastics. This section of the report proposes a range of ways that the consumption and production of plastic could be reduced on an intergovernmental, governmental, community and individual level.

GOVERNMENTS

Plastic packaging tax

Plastic taxes are a promising area of reform and are currently being introduced overseas. The European Union (EU), for example, is in the process of implementing a plastic packaging tax to “reduce packaging waste and stimulate Europe’s transition towards a circular economy”.¹³³ This tax is calculated by weight and levied at a uniform rate of €800 per tonne on non-recycled plastic packaging waste.¹³⁴ Initial estimates by KPMG indicate that this tax will provide approximately €7 billion per year in revenue.¹³⁵ The EU divulges responsibility to individual member states for how the tax can be paid: either directly from its state coffers, or by designing domestic taxes to be levied on plastic products. Italy and Spain have opted to partially pass the tax on to importers and producers of plastic, and this provides a useful demonstration of the plastic tax in operation.

In Spain, each kilogram of non-reusable plastic packaging is taxed at €0.45.¹³⁶ The tax is applied to non-recycled packaging that cannot be reused (for example, when it cannot be refilled multiple times). The tax, which is applied to the manufacture and importation of plastic for final use within the Spanish market, is predicted to raise €724 million in revenue annually.¹³⁷

¹³³ European Union (2018) *Proposal for a Council decision on the system of own resources of the European Union*, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018PC0325>

¹³⁴ KPMG (2023) *Plastic taxes – A European perspective*, <https://kpmg.com/xx/en/home/insights/2022/11/plastic-taxes-a-european-perspective.html>

¹³⁵ Ibid.

¹³⁶ Since 1 January 2023. Ernst and Young (2022) *Spain introduces new indirect tax on non-reusable plastic packaging as of 1 January 2023*, https://www.ey.com/en_gl/tax-alerts/spain-introduces-new-indirect-tax-on-non-reusable-plastic-packaging-as-of-1-january-2023

¹³⁷ Ibid.

The UK has also instituted a plastic packaging tax, levied on the manufacture or import of plastic that contains less than 30% recycled plastic.¹³⁸ In this case plastic packaging is charged at a rate of £210.82 per tonne.¹³⁹ In its first year, the tax raised £276 million.¹⁴⁰ While it is too early to tell how effective the policy has been, revenue projections incorporate an adjustment to account for behavioural responses to the forward estimates. Policy makers are anticipating that the tax will lead to a reduction in packaging use, and an increase in recycled content, which will mean that less revenue is collected over time.¹⁴¹ The UK Government consequently described the scheme as both driving “greater use of recycled plastic and helping to reduce plastic waste”.¹⁴²

Given the effectiveness of these taxes in Europe, there is every reason to believe a similar policy would help reduce plastic packaging waste in Australia. This tax could be levied on businesses that import or manufacture plastic packaging in Australia, similar to what happens in the UK, and in EU member states like Spain. As Figure 6 below shows, if Australia taxed virgin plastic packaging at the same rate as the EU taxes non-recycled plastic waste (€800 per tonne), it would translate to a tax of approximately \$1,300 per tonne of virgin plastic packaging.¹⁴³ The latest Australian Packaging Covenant Organisation report estimates that 1.179 million tonnes of plastic packaging was placed on market in 2020-21 in Australia.¹⁴⁴ Of this, approximately 1.12 million tonnes are estimated to be sourced from virgin feedstocks.¹⁴⁵ If the estimated consumption of virgin plastic packaging was taxed at this rate, it would raise \$1.457 billion. To put this into context, the Australian Government’s

¹³⁸ UK Government (2023) *Plastic Packaging Tax: Steps to take*, <https://www.gov.uk/guidance/check-if-you-need-to-register-for-plastic-packaging-tax>

¹³⁹ Ibid. Since 1 April 2023

¹⁴⁰ Speare-Cole (2023) ‘HMRC collects £276m from plastic packaging tax in first year’, *Independent*, <https://www.independent.co.uk/climate-change/news/treasury-government-hmrc-environmental-services-association-recycling-association-b2394739.html>

¹⁴¹ UK Government (2023) *Introduction of Plastic Packaging Tax from April 2022*, <https://www.gov.uk/government/publications/introduction-of-plastic-packaging-tax-from-april-2022/introduction-of-plastic-packaging-tax-2021>

¹⁴² UK Government (2019) *Government sets out plans to overhaul waste system*, <https://www.gov.uk/government/news/government-sets-out-plans-to-overhaul-waste-system>

¹⁴³ Estimated equivalent dollars per Euro based on the exchange rate as of 6 October 2023.

¹⁴⁴ According to APCO, packaging is defined as being ‘placed on market’ “when it is first made available to the end-consumer”. See Australian Packaging Covenant Organisation (2023) *Australian Packaging Consumption Recovery Data 2020-21*, p 114. Note that this figure is just for the consumption of plastic packaging and is not to be confused with total plastic consumption (which includes packaging and non-packaging plastic). Australian Packaging Covenant (2023) *Australian packaging consumption and recycling data 202-21*, p 2, <https://documents.packagingcovenant.org.au/public-documents/Australian%20Packaging%20Consumption%20And%20Recovery%20Data%202020-21>

¹⁴⁵ Ibid, p 7

Recycling Modernisation Fund – which is for many kinds of waste besides plastic – is worth just \$250 million.¹⁴⁶ Such a tax on plastics would provide nearly six times that amount.

Figure 6: Estimated revenue generated from an Australian Plastic Packaging Tax

Total plastic packaging	Total virgin plastic	Tax levied	Total revenue
1,179,000 tonnes	1,121,000 tonnes	\$1,300/tonne	\$1.457 billion

Source: *Australian Packaging Covenant (2023)*¹⁴⁷

Making plastic more expensive, especially plastic that is made from virgin materials, encourages companies to move to more sustainable materials or towards more recyclable forms of plastics. This tax could also pay for the costs of increased recycling. It would also make recycled plastic more competitive with virgin plastic, therefore providing a financial incentive for industry to change its ways.

Producer responsibility programs

Another promising policy option is extended producer responsibility (EPR) schemes in which a “producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle”.¹⁴⁸ EPR polices ensure that producers pay for the costs imposed by a product over its entire lifecycle, including waste management and recycling. EPR is thought to incentivise better practice at the design stage, which can increase the resource efficiency and lower the environmental impact of a product.¹⁴⁹

The UK is set to phase in extended producer responsibility laws from 2025.¹⁵⁰ The laws will apply to all businesses with an annual turnover of £1 million who are responsible for using 25 tonnes of packaging or more.¹⁵¹ These companies will bear responsibility for collecting and reporting on supplied or imported packaging, and pay fees for waste management,

¹⁴⁶ DCCEEW (2023) *Investing in Australia’s waste and recycling infrastructure*, <https://www.dcceew.gov.au/environment/protection/waste/how-we-manage-waste/recycling-modernisation-fund>

¹⁴⁷ Australian Packaging Covenant Organisation (2023) *Australian Packaging Consumption Recovery Data 2020-21*, p 7

¹⁴⁸ OECD (n.d.) *Extended Producer Responsibility*, <https://www.oecd.org/environment/extended-producer-responsibility.htm>

¹⁴⁹ UN Environment Program (n.d.) *Reducing plastic pollution through the Extended Producer Responsibility*, <https://www.unep.org/reducing-plastic-pollution-through-extended-producer-responsibility>

¹⁵⁰ UK Government (2023) *Update on packaging reforms to help drive down inflation*, <https://www.gov.uk/government/news/update-on-packaging-reforms-to-help-drive-down-inflation>

¹⁵¹ UK Government (2022) *Extended producer responsibility for packaging: who is affected and what to do*, <https://www.gov.uk/guidance/extended-producer-responsibility-for-packaging-who-is-affected-and-what-to-do>

administration and environmental regulation.¹⁵² Large companies also have to supply a certificate to prove that the waste has been recycled at the end of its life.¹⁵³

The scheme was first proposed in 2019 by the UK Government's Environment Secretary Michael Gove. He explained the scheme as designed to ensure that "producers foot the bill for handling their packaging waste".¹⁵⁴ Without an EPR scheme, the government estimated that "packaging producers pay only around 10 per cent of the cost of dealing with packaging waste".¹⁵⁵ "By increasing that amount", the report continued, the "government will incentivise producers to think carefully about using less packaging, and to switch to using packaging that is easier to recycle".¹⁵⁶ In this sense, EPR schemes are both designed to encourage recycling and cut down on plastic packaging use altogether.

Australia could easily adopt similar policies. In fact, it already has extended producer responsibility schemes in place for some other products. The *Australian National Television and Computer Recycling Scheme* is one example. Under this scheme, the television and computer industries are required to fund the collection and recycling of a portion of used televisions and computers.¹⁵⁷ This diverts waste from landfill and helps to recover valuable materials for future use.¹⁵⁸ However, the scheme is relatively small, and any similar scheme for plastics would need to incorporate the actual portion of waste produced, and not just a small portion of it.

COMMUNITY GROUPS

Community groups, local councils and industry can all help to reduce plastic waste. Communities can take direct action by organising clean up events to remove plastics and other rubbish from our beaches, waterways, parks and other public spaces. Community groups and councils can also make sure adequate bins are provided for the proper disposal and recycling of waste at social and public events.

Community groups that facilitate the sharing of consumer products can help reduce waste. Online and in-person buy-nothing groups, garage sales, op shops and markets allow people

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ UK Government (2019) *Government sets out plans to overhaul waste system*, <https://www.gov.uk/government/news/government-sets-out-plans-to-overhaul-waste-system>

¹⁵⁵ Ibid.

¹⁵⁶ Ibid.

¹⁵⁷ DCCEEW (2023) *National Television and Computer Recycling Scheme*, <https://www.dcceew.gov.au/environment/protection/waste/product-stewardship/products-schemes/television-computer-recycling-scheme>

¹⁵⁸ Ibid.

to swap, borrow, lend, purchase, resell or hire items. This saves people from having to purchase brand new plastic things.

Tool and other product libraries are another avenue for community members to reuse and share consumer goods that are typically used just a few times before they are discarded. Similarly, party kit rental platforms allow people to hire out reusable party paraphernalia to prevent the purchase of single use plastics. Actions based on the redesign, repurposing or upcycling of plastics and other materials can also reduce waste.

Local Councils, organisations or community groups can facilitate reuse through hubs or warehouses for items that are expensive or only needed for short-term uses. They can help connect charities, schools, and vulnerable people with businesses willing to donate unsold or surplus goods.

There is significant potential at the community level, but education is needed to shift behaviours and attitudes towards reducing plastic use and plastic elimination. Local councils, charity groups and grassroots organisations can help by hosting workshops and information sessions for the public to engage and adopt ways of reducing plastic use in homes, schools and workplaces.

HOUSEHOLDS AND INDIVIDUALS

Individuals and households can all play a role in reducing and eliminating plastics waste by following the key principles of reducing, reusing, repurposing and, where necessary, recycling. Where plastic use is absolutely necessary, it is critical that individuals aim to reuse existing plastic.

Reduction means avoiding buying more plastics than necessary. This should be the first point of action if possible. In many instances this requires thinking and planning ahead to make the process easy and convenient for the individual and household.

By reusing as much as possible, households and individuals can help phase out single-use and disposable plastics, such as plastic cups, plastic shopping bags and takeaway plastic containers. In addition to reusing existing plastics, people can help reduce waste by opting for items made from materials such as metal, cellulose, starches and bamboo. Reusable coffee cups, beeswax wraps, steel straws and reusable bags are all examples of how people are already making these changes. However, it must be noted that researchers have found some evidence that many plastic alternatives may contain toxic chemicals.¹⁵⁹

¹⁵⁹ Zimmermann (2020) 'Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition', *Environment International*, <https://www.sciencedirect.com/science/article/pii/S0160412020320213>

Product refill programs offer consumers another opportunity to reduce waste. Milk delivery refill systems, for instance, often use refillable glass bottles to reduce the use of plastics. The central premise of these programs is that the containers can be delivered to homes, or milk dispensers can be installed in grocery stores where customers can use glass bottles then return them to refill when they are purchasing milk. This system can be used for shampoo and hundreds of everyday products that use high amounts of plastic packaging. If scaled, a system like this can drastically reduce single-use plastic waste. One milk company has developed an 18-litre refillable keg for commercial use. The kegs can be used to refill glass bottles, and each keg eliminates the need for 7,000 single-use plastic bottles over the course of its lifetime.¹⁶⁰

Reuse programs such as this can also be adapted for the restaurant and hospitality sectors where daily single-use plastic takeaway containers are rampant and a major polluter. People can also consider whether getting food to go is really necessary, or if cooking meals at home to avoid plastic takeaway containers is an option.¹⁶¹

Individuals can also make choices about the clothes they wear. The OECD estimates that washing synthetic textiles may be the source of up to 35% of total annual releases of microplastics to the oceans¹⁶². Currently, between 200,000 and 500,000 tonnes of microplastics get into the ocean from textiles.¹⁶³ Synthetic textiles such as polyester are made from fossil-fuel derived plastics. Purchasing less synthetic clothing and washing synthetics less often will reduce the amount of microplastics entering the ocean.

Individuals and households can also advocate for larger structural change by putting pressure on the businesses that produce and use plastics. People can write letters, use social media, and work with local, state or federal representatives to push for legislation to regulate the production and consumption of plastic waste. People can also contribute to systemic change by voting with their money, and choose to patronise businesses that use sustainable products.

¹⁶⁰ Fleurieu Milk Company (n.d.) *Fleurieu Milk launches new refillable milk bottle program*, <https://www.fleurieumilkco.com.au/fleurieu-milk-launches-new-refillable-milk-bottle-program/>

¹⁶¹ WWF (n.d.), *Tips to reduce your plastic waste*, <https://www.wwf.org.uk/updates/top-tips-reduce-your-plastic-footprint>

¹⁶² OECD, *Workshop on Microplastics from Synthetic Textiles: Knowledge, Mitigation, and Policy (2020) Summary note*, p 2, https://www.oecd.org/water/Workshop_MP_Textile_Summary_Note_FINAL.pdf

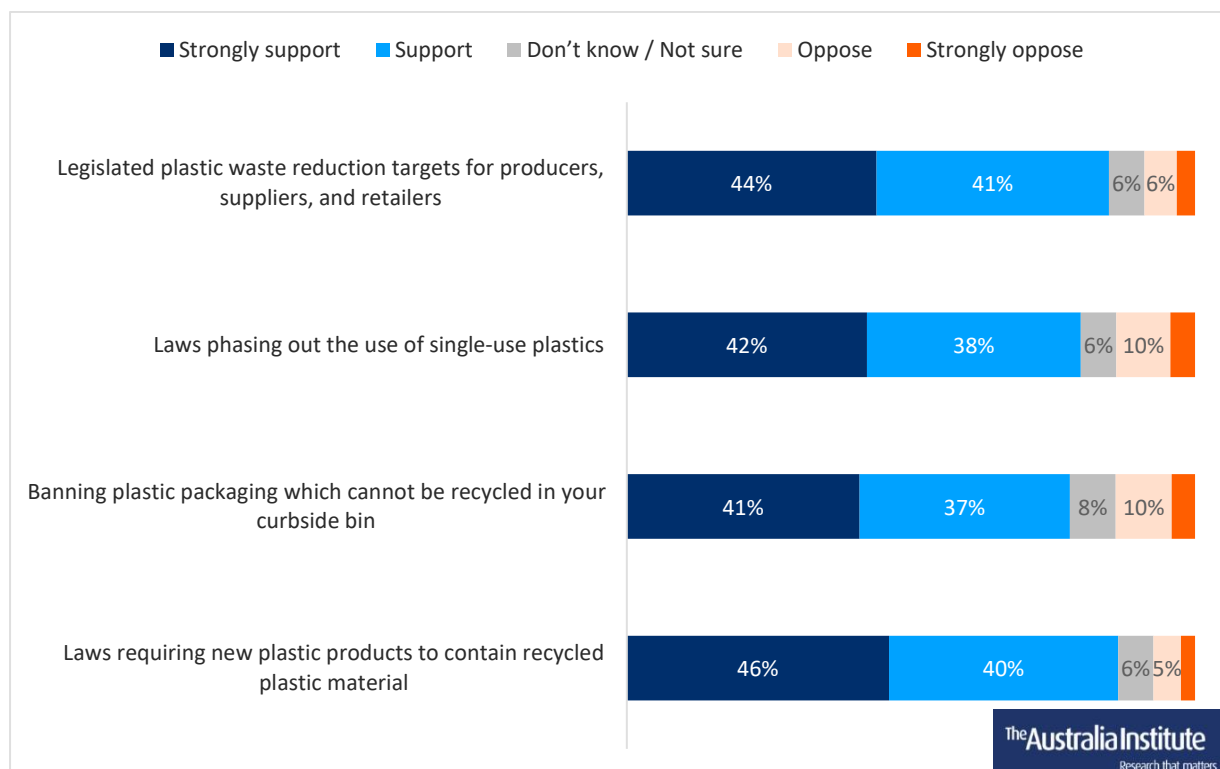
¹⁶³ European Environment Agency (n.d.) *Microplastics from textiles: towards a circular economy for textiles in Europe*, <https://www.eea.europa.eu/publications/microplastics-from-textiles-towards-a>

Consumer perspectives on plastic waste

Between 6 June and 9 June 2023, The Australia Institute surveyed a nationally representative sample of 1,002 adults living in Australia (full polling details can be found in the Appendix).

The responses indicate that a clear majority of Australians support various regulatory and legislative reforms to reduce plastic waste. Figure 7 shows 85% support for legislated plastic waste reduction targets for producers, suppliers and retailers; 80% support for laws to phase out the use of single-use plastics; 78% support for banning plastic which cannot be recycled in a curbside bin; and 86% support for laws requiring new plastic products to contain recycled plastic material.

Figure 7: Support for regulatory and legislative changes

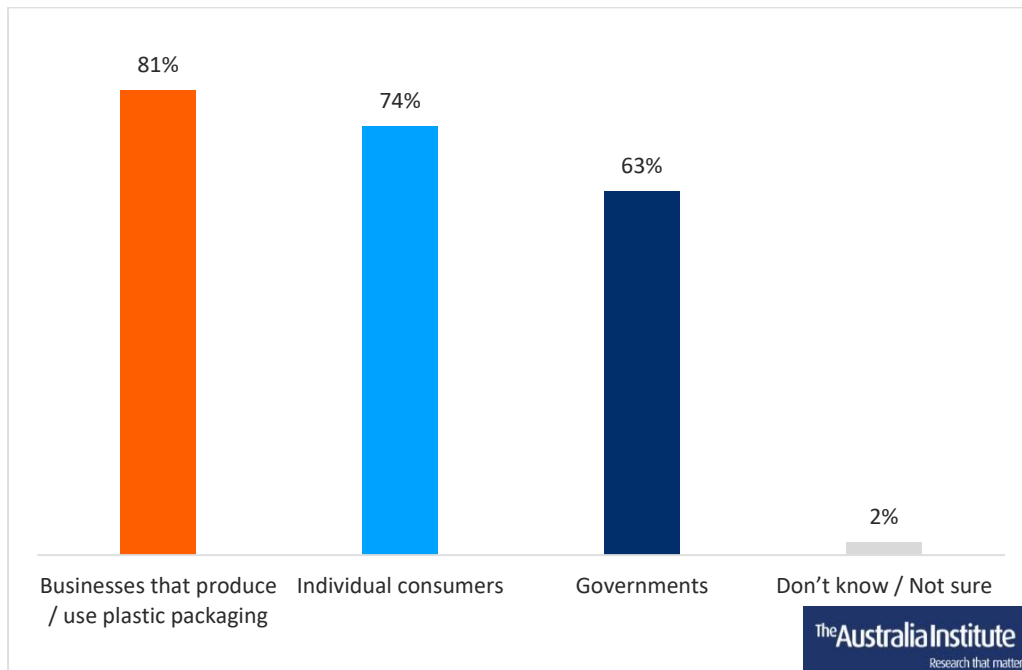


Source: Australia Institute polling

Figure 8 shows that Australians think that businesses are the most responsible party for reducing plastic packaging waste. Four in five Australians believe that businesses that produce/use plastic packaging should be responsible for reducing plastic waste, three in

four Australians (74%) nominate individual consumers, and just over three in five (63%) nominate government.

Figure 8: Responsibility for reducing plastic waste



Source: Australia Institute polling

Conclusion

Despite repeated promises from successive governments, Australia has a growing plastic waste problem. So far, the ‘circular economy’ has been touted as the cure-all solution. But the plastic waste crisis is driven by ever increasing production and consumption, not the perpetually underperforming plastic recycling industry. Only about 15% of all plastic waste generated over the last 20 years has been recovered through recycling, composting or energy recovery.¹⁶⁴ These forms of plastic waste recovery have not kept pace with consumption and waste because they are difficult and costly, and unlikely to ever match current levels of plastic waste. The recycling process also sheds high levels of microplastics, which is just one way that plastics create environmental and health issues. Given this, it is hard to see the idea that Australia will recycle our way out of the plastics waste crisis as anything more than greenwash. As environmental organisation *Break Free From Plastic* puts it: “We cannot recycle our way out of the plastic problem and companies that are claiming it is the solution are simply avoiding making real change.”¹⁶⁵

The only way to effectively reduce plastic pollution is to drastically reduce the production and consumption of plastics in the first place. Instead of a doubling the amount of waste we produce we should aim to cut it by half. However, current policies do not include measures to cap or phase down the production and consumption of plastics. A reduction in production and consumption, similar to carbon reduction targets, could set the agenda for real action on plastics waste.

Other solutions include extended corporate responsibility programs such as the one that will soon be introduced in the UK, and a plastics tax similar to what the European Union is looking to implement. The tax raised through these policies could be used as a source of funding to solve many of these issues.

Like the rest of the world, Australia is a long way from eliminating the use of plastics. Even reducing production and consumption to a level that it can all be effectively dealt with in a truly circular economy seems like a distant utopia. What can be done in the interim? We propose the following ‘360 ecology check’ to address the issues discussed in this report. This check would ensure that plastics are managed holistically, from production through to use and disposal, and to put an end to claims about recycling that are misleading and ineffective at dealing with the plastics waste problem. The 360 ecology check aims to ensure that plastics and the systems for dealing with plastic when they become waste are:

¹⁶⁴ Recovered plastic as a portion of all plastic waste generated for years 2000 to 2020–21.

¹⁶⁵ Nation of Change (2020) *Coca-Cola leading plastic polluter worldwide for second year in a row*, <https://www.nationofchange.org/2020/09/05/coca-cola-leading-plastic-polluter-worldwide-for-second-year-in-a-row/>

- non-toxic to humans, animals and the environment in the near future
- follow circular economy principles of design and continuous reuse
- produce zero or very few emissions
- Extract few or no virgin resources
- periodic reviews of solutions to maintain the above criteria.

Until Australia's policies are based on these principles, we will continue to endure a situation in which the purported solutions are incapable of dealing with the scope and magnitude of the plastics waste problem. Investment in research and development to create bioplastics and waste management processes that meet these criteria would be an investment in the environment and health of all Australians.

Appendix

Method

Between 6 June and 9 June 2023, The Australia Institute surveyed 1,002 adults living in Australia, online through Dynata's panel, with nationally representative samples by gender, age group and state/territory.

Voting crosstabs show voting intentions for the House of Representatives. Those who were undecided were asked which way they were leaning; these leanings are included in voting intention crosstabs.

The research is compliant with the Australian Polling Council Quality Mark standards. The long methodology disclosure statement follows.

Long disclosure statement

The results were weighted by three variables (gender, age group, and state or territory) based on Australian Bureau of Statistics "National, state and territory population" data, using the raking method. Those who answered the gender identity question as "Non-binary", "I use a different term", or "Prefer not to answer", had their responses included with females for the purpose of reporting, due to constraints from weighting data availability. This resulted in an effective sample size of 943.

The margin of error (95% confidence level) for the national results is $\pm 3\%$.

Results are shown only for larger states.

Voting intention questions appeared just after the initial demographic questions, before policy questions. Respondents who answered "Don't know / Not sure" for voting intention were then asked a leaning question; these leanings are included in voting intention crosstabs. "Coalition" includes separate responses for Liberal and National. "Other" refers to Independent/Other, and minor parties in cases where they were included in the voting intention but represent too small a sample to be reported separately in the crosstabs.



Detailed results

Preceding questions in the poll are expected to have influenced the results of some of the questions published here. The questions, and the response options for each question, are included in the order that they appeared:

How concerned are you about plastic packaging waste?

Response options were presented in random order.

- Very concerned
- Fairly concerned
- Not very concerned
- Not at all concerned
- Don't know / Not sure

Do you trust that when you put something in the recycling bin it will be recycled?

Response options were presented in random order.

- Yes
- No
- Don't know / Not sure

How would you rate your knowledge of what you can and cannot recycle in your curbside recycling bin?

Response options were presented in random order.

- Very good
- Good
- Poor
- Very poor
- Don't know / Not sure

To the best of your knowledge, identify whether the following plastics are recyclable in your curbside bin in Australia:

1. PETE
2. HDPE
3. PVC
4. LDPE
5. PP
6. PS

7. Other

Response options were presented in random order.

- Recyclable
- Non-recyclable
- Don't know / Not sure

Who should be responsible for reducing plastic packaging waste?

	<i>Total</i>	Male	Female	18-29	30-39	40-49	50-59	60+
Businesses that produce/use plastic packaging	81%	77%	84%	72%	79%	82%	82%	86%
Individual consumers	74%	71%	77%	67%	75%	79%	74%	76%
Governments	63%	60%	67%	71%	66%	66%	60%	56%
Don't know / Not sure	2%	2%	3%	1%	4%	4%	2%	1%

	<i>Total</i>	NSW	VIC	QLD	WA
Businesses that produce/use plastic packaging	81%	79%	81%	81%	77%
Individual consumers	74%	78%	72%	73%	71%
Governments	63%	61%	65%	66%	56%
Don't know / Not sure	2%	4%	2%	1%	2%

	<i>Total</i>	Labor	Coalition	Greens	PHON	Other
Businesses that produce/use plastic packaging	81%	78%	81%	85%	75%	87%
Individual consumers	74%	74%	75%	76%	76%	71%
Governments	63%	67%	53%	86%	40%	63%
Don't know / Not sure	2%	2%	3%	1%	0%	4%

Do you support or oppose the following initiatives?

“Laws requiring new plastic products to contain recycled plastic material.”

	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>18-29</i>	<i>30-39</i>	<i>40-49</i>	<i>50-59</i>	<i>60+</i>
Strongly support	46%	42%	50%	46%	45%	47%	46%	47%
Support	40%	43%	37%	39%	40%	37%	38%	44%
Oppose	5%	6%	4%	6%	4%	9%	2%	3%
Strongly oppose	2%	4%	1%	4%	3%	3%	3%	1%
Don't know / Not sure	6%	5%	8%	5%	8%	3%	11%	5%

	<i>Total</i>	<i>NSW</i>	<i>VIC</i>	<i>QLD</i>	<i>WA</i>
Strongly support	46%	47%	41%	49%	58%
Support	40%	40%	42%	41%	30%
Oppose	5%	4%	7%	4%	3%
Strongly oppose	2%	2%	3%	1%	1%
Don't know / Not sure	6%	6%	7%	5%	9%

	<i>Total</i>	<i>Labor</i>	<i>Coalition</i>	<i>Greens</i>	<i>PHON</i>	<i>Other</i>
Strongly support	46%	47%	40%	66%	38%	39%
Support	40%	41%	47%	26%	34%	37%
Oppose	5%	4%	5%	3%	8%	6%
Strongly oppose	2%	1%	4%	1%	13%	0%
Don't know / Not sure	6%	6%	4%	4%	6%	18%

“Banning plastic packaging which cannot be recycled in your curbside bin.”

	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>18-29</i>	<i>30-39</i>	<i>40-49</i>	<i>50-59</i>	<i>60+</i>
Strongly support	41%	39%	43%	37%	37%	46%	37%	46%
Support	37%	38%	36%	41%	41%	31%	36%	36%
Oppose	10%	12%	8%	14%	12%	10%	9%	7%
Strongly oppose	4%	5%	3%	4%	3%	6%	6%	3%
Don't know / Not sure	8%	6%	10%	5%	7%	7%	13%	9%

	<i>Total</i>	<i>NSW</i>	<i>VIC</i>	<i>QLD</i>	<i>WA</i>
Strongly support	41%	42%	38%	45%	43%
Support	37%	34%	38%	37%	40%
Oppose	10%	10%	11%	8%	9%
Strongly oppose	4%	5%	4%	3%	3%
Don't know / Not sure	8%	8%	9%	7%	5%

	<i>Total</i>	<i>Labor</i>	<i>Coalition</i>	<i>Greens</i>	<i>PHON</i>	<i>Other</i>
Strongly support	41%	42%	32%	59%	35%	41%
Support	37%	39%	44%	26%	18%	33%
Oppose	10%	8%	13%	7%	16%	9%
Strongly oppose	4%	2%	6%	2%	20%	1%
Don't know / Not sure	8%	8%	6%	6%	11%	15%

“Laws phasing out the use of single-use plastics.”

	<i>Total</i>	Male	Female	18-29	30-39	40-49	50-59	60+
Strongly support	42%	37%	47%	41%	36%	45%	41%	46%
Support	38%	42%	33%	40%	42%	36%	33%	37%
Oppose	10%	10%	9%	10%	11%	9%	11%	8%
Strongly oppose	4%	6%	3%	5%	4%	5%	7%	2%
Don't know / Not sure	6%	5%	8%	4%	8%	5%	7%	7%

	<i>Total</i>	NSW	VIC	QLD	WA
Strongly support	42%	43%	37%	47%	51%
Support	38%	36%	40%	36%	36%
Oppose	10%	9%	11%	9%	7%
Strongly oppose	4%	6%	4%	3%	2%
Don't know / Not sure	6%	6%	7%	5%	4%

	<i>Total</i>	Labor	Coalition	Greens	PHON	Other
Strongly support	42%	43%	35%	64%	30%	38%
Support	38%	40%	43%	25%	27%	36%
Oppose	10%	10%	11%	4%	14%	8%
Strongly oppose	4%	2%	6%	2%	22%	0%
Don't know / Not sure	6%	5%	4%	4%	8%	18%

“Legislated plastic waste reduction targets for producers, suppliers, and retailers.”

	<i>Total</i>	Male	Female	18-29	30-39	40-49	50-59	60+
Strongly support	44%	40%	48%	47%	41%	44%	41%	46%
Support	41%	44%	38%	37%	44%	41%	41%	42%
Oppose	6%	6%	5%	8%	6%	6%	5%	4%
Strongly oppose	3%	5%	2%	5%	3%	5%	4%	1%
Don't know / Not sure	6%	5%	8%	4%	7%	4%	9%	7%

	<i>Total</i>	NSW	VIC	QLD	WA
Strongly support	44%	47%	38%	48%	49%
Support	41%	36%	42%	42%	45%
Oppose	6%	6%	8%	5%	1%
Strongly oppose	3%	3%	5%	1%	3%
Don't know / Not sure	6%	7%	7%	5%	3%

	<i>Total</i>	Labor	Coalition	Greens	PHON	Other
Strongly support	44%	47%	34%	66%	36%	36%
Support	41%	40%	50%	28%	32%	39%
Oppose	6%	5%	7%	2%	9%	5%
Strongly oppose	3%	1%	4%	2%	19%	2%
Don't know / Not sure	6%	6%	5%	3%	3%	18%