



AUSTRALIA

BACKGROUNDER

NO PLASTICS IN NATURE • OCTOBER 2021



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ENDING CIGARETTE BUTT POLLUTION

Cigarette butts are consistently the most littered item in Australia.¹ **Of the 17.75 billion cigarettes consumed in Australia each year², between 5.9 and 8.9 billion end up as litter.³** Current policy settings focus on solutions directed at the individual, such as disposal infrastructure and smoker education. While important, these have so far failed to effectively address the problem of cigarette butt pollution.

Several governments around the world are introducing measures to make tobacco companies responsible for reducing and managing tobacco product waste, including plastic cigarette filters. New research commissioned by WWF-Australia shows that similar regulation in Australia could reduce cigarette butt leakage into the environment by 3-4.45 billion a year – or more. Product stewardship is a compelling way to drive industry responsibility and reduce plastic pollution.

THE TRUE COST OF CIGARETTE BUTTS

Littered butts pose a range of hazards and problems in natural environments. Cigarette filters are made from non-biodegradable plastic. Once littered, butts accumulate in the marine environment and leach toxic materials.⁴ They break up slowly, shedding microfibres and taking up to 14 years to decompose.⁵

Around one-third of nearly 100 chemicals that leach from cigarette butts are acutely or chronically toxic to aquatic species.⁶ Cigarette butts have been found in the stomachs of birds, turtles, whales and fish, where they affect digestion and potentially lead to poisoning or starvation.⁷ Birds that line their nests with discarded butts

¹ Clean Up Australia Day Annual Rubbish Report 2019 and Keep Australia Beautiful. National Litter Index 2018/19.

² Correspondence with Dr Michelle Scollo, senior policy adviser on tobacco at Cancer Council Victoria and editor of *Tobacco in Australia*, 22 July 2021.

³ Harford, N. and French, J. 2021. *Ending cigarette butt litter*. Equilibrium, Melbourne.

⁴ Slaughter, E., Gersberg, R.M., Watanabe, K., Rudolph, J., Stransky, C. and T.E. Novotny. 2011. Toxicity of cigarette butts, and their chemical components, to marine and freshwater fish. *Tobacco Control* 20:i25-i29.

⁵ Joly, F-X. and Coulis, M. 2018. Comparison of cellulose vs plastic cigarette filter decomposition under distinct disposal environments. *Waste Management* Vol 72; Belzagui, F., Buscio, V., Gutiérrez-Bouzán, C. and M. Vilaseca. 2021. Cigarette butts as a microfiber source with a microplastic level of concern. *Science of The Total Environment* Volume 762.

⁶ Venugopal, P. *et al.* 2021. No Butts on the Beach: Aquatic Toxicity of Cigarette Butt Leachate Chemicals. *Tobacco Regulatory Science* 7(1): 17-30.

⁷ Kadir, A. and Sarani, N. 2015. Cigarette butts pollution and environmental impact – A review. *Applied Mechanics and Materials* 773-74:1106-1110, Trans Tech Publications; Torkashvand, J., Farzadkia, M., Sobhi, H.R. and A. Esrafilii. 2019. Littered cigarette butt as a well-known hazardous waste: A comprehensive systematic review. *Journal of Hazardous Materials* 383:121242; Dobaradaran, S., Soleimani, F., Akhbarizadeh, R., Schmidt, T.C., Marzban, M. *et al.* 2021. Environmental fate of cigarette butts and their toxicity in aquatic organisms: A

might benefit from reduced parasites, but they and their chicks may also experience long-term genetic damage and other health risks due to their exposure to toxic chemicals.⁸

As well as diminishing the enjoyment and value of our natural landscapes, substantial financial costs are incurred in managing cigarette butt pollution. The cost of tobacco-related litter removal has been estimated at around \$73 million per year.⁹ This cost is met primarily by state, territory and local governments, which manage litter prevention and removal. Ultimately, taxpayers foot the bill for managing tobacco product waste.¹⁰

INTERNATIONAL ACTION ON PLASTIC FILTERS

Cigarette filters were introduced in the 1950s, with tobacco companies claiming they provided a safer alternative to filter-free cigarettes.¹¹ Numerous studies have since shown that filters do not make smoking significantly less harmful. Some health experts have advocated the elimination of filters on the basis that they do not protect against the dangers of smoking but instead encourage smokers to puff more frequently and draw harder with each puff.¹²

Internationally, numerous efforts aim to reduce the negative harmful impacts of cigarette butts on the environment as well as human health. The European Union's Single-Use Plastic Directive 2019 requires member states to implement extended producer responsibility schemes for tobacco filter producers. The United Kingdom is exploring options to "require the tobacco industry to pay the full disposal costs of tobacco waste products".¹³

In 2020 US lawmakers introduced the Break Free From Plastic Pollution Act (still under consideration), which would enshrine extended producer responsibility for plastic bottles, packaging and cigarette filters. The New Zealand Government is currently considering banning cigarette filters as part of its goal for the country to be smoke-free by 2025.¹⁴

Tobacco companies have funded litter reduction and clean-up campaigns in several countries. Tobacco control advocates warn of the 'greenwashing' potential of these philanthropic activities.¹⁵ Tobacco companies can also exploit government environmental initiatives to get around legislation prohibiting traditional forms of tobacco marketing and policies to prevent undue influence on decision-making.¹⁶

ASSESSING AUSTRALIA'S OPTIONS

While efforts to date have resulted in modest reductions in butt pollution,¹⁷ up to 8.9 billion butts continue to leak into our environment each year, on top of the billions of butts historically leaked and in various stages of decomposition. Stronger action is needed to effectively tackle this problem at its source. Informed by international experience, Australia should develop its own solution that holds the tobacco industry responsible for the pollution its products create.

WWF-Australia commissioned Equilibrium to investigate the feasibility and likely impact of several policy options. It found the greatest reductions in cigarette butt pollution would likely be achieved by a mandatory

comprehensive systematic review. *Environmental Research* 110881; Green, D.S. *et al.* 2020. Smoked cigarette butt leachate impacts survival and behaviour of freshwater invertebrates. *Environmental Pollution* 266:115286.

⁸ Suárez-Rodríguez, M. and Macías García, C. 2014. There is no such thing as a free cigarette; lining nests with discarded butts brings short-term benefits, but causes toxic damage. *Journal of Evolutionary Biology* 27: 2719-2726.

⁹ Tait, R. 2019. Identifying the Social Costs of Tobacco Use to Australia in 2015/16. National Drug Research Institute.

¹⁰ *Ibid.*

¹¹ United States Department of Health and Human Services. 2001. Risks associated with smoking cigarettes with low tar machine-measured yields of tar and nicotine. *Smoking and Tobacco Control* Monograph 13. National Cancer Institute.

¹² Novotny, T., Bialous, S., Burt, L., Curtis, C., Costa, V., Iqtidar, S., Liu, Y., Pujari, S. and E. Tursan d'Espaignet. 2015. The environmental and health impacts of tobacco agriculture, cigarette manufacture and consumption. *Bulletin of the World Health Organization* 93, 877-880.

¹³ Harford, N. and French, J. 2021. *Ending cigarette butt litter*. Equilibrium, Melbourne.

¹⁴ *Ibid.*

¹⁵ Tobacco Control Research Group at the University of Bath. Tobacco Tactics: CSR Strategy. <https://tobaccotactics.org/wiki/csr-strategy/>

¹⁶ Evans-Reeves K., Lauber K. and R. Hiscock. 2021. The 'filter fraud' persists: the tobacco industry is still using filters to suggest lower health risks while destroying the environment. *Tobacco Control*.

¹⁷ Harford, N. and French, J. 2021. *Ending cigarette butt litter*. Equilibrium, Melbourne.

national product stewardship scheme and/or ban on single-use plastic filters. Current efforts, combined with proposed interventions, could more than halve plastic cigarette butt litter.¹⁸

IMPACT ASSESSMENT

Equilibrium’s assessment considered the impacts of different solutions in relation to regulatory, economic, market, consumer and environmental factors. While a range of options were assessed, it is noted that industry-led and co-regulatory options may not be feasible due to restrictions on industry/government interaction.

Policy option	Description	Overall impact
Business as usual	No new program or scheme	Low
Industry voluntary product stewardship	Industry funds and operates a program	Moderate
Co-regulatory product stewardship scheme (national)	Co-regulatory scheme under the Recycling and Waste Reduction Act 2020, operated by industry and regulated by the Government	Moderate
Regulated product stewardship scheme (national)	Mandatory scheme under the act, operated by the Federal Government	High
Regulated product stewardship scheme (states and territories)	Mandatory scheme delivered by individual jurisdictions	Moderate
State and territory bans on plastic filters	Individual jurisdictions ban the sale of plastic filters	Moderate
National ban on plastic filters	Federal Government bans the sale of plastic filters	High

MANDATORY NATIONAL PRODUCT STEWARDSHIP

A product stewardship scheme could shift costs and responsibility away from taxpayers and onto producers, users and polluters. It could expand the collection, recovery and reprocessing of cigarette butts, as well as research and development for improved recovery, processing and design, and scale up public awareness efforts. Equilibrium states that a national mandatory scheme would deliver the greatest environmental benefits.

Equilibrium proposes a levy of \$0.004 (less than half a cent) per cigarette to raise \$71 million per year to fund clean-up costs currently met by governments and taxpayers. Alternatively, a levy could be paid directly by brand owners as part of a product stewardship scheme to fund litter reduction, management and take-back schemes.

A BAN ON PLASTIC FILTERS

A national ban on plastic cigarette filters would have a significant impact on plastic butt litter as it removes the part of the product that has the most significant negative environmental impacts. However, assessing the

¹⁸ Ibid.

feasibility and broader impact of such a ban – particularly in relation to health outcomes – requires further work in close collaboration with the public health sector and tobacco control experts. Research and consultation should be undertaken to explore the viability of a plastic filter ban and potential alternatives such as biodegradable filters.

THE WAY FORWARD

Two policy options were assessed as having high impact overall, particularly in relation to environmental outcomes. These are a national approach to regulation through a mandatory product stewardship scheme and a national ban on plastic cigarette filters. Both require further work to explore impacts in other areas, feasibility and scheme design.

The Australian Government has committed to initiating a stewardship taskforce to reduce cigarette butt litter.¹⁹ This taskforce should be a government-led, cross-sector taskforce comprising experts from the environment and health sectors, drawing on expertise from within government, NGOs and academia. It should consult with industry only as required, in accordance with relevant guidance.²⁰

The taskforce should lead the development of a product stewardship scheme, working in partnership with the states and territories and the Product Stewardship Centre of Excellence. This scheme should be mandatory and overseen by the Australian Government. As a matter of priority, the taskforce should also lead further research and consultation to assess the viability and impact of banning plastic cigarette filters.

The cost of inaction is clear – continued pollution of our natural environments and harm to Australian wildlife. However, Australia has historically been an international leader on tobacco control. It's time we seized the opportunity to combine bold ambition on plastic reduction and pollution with our strong track record in public health, to take decisive action on cigarette butts.



Working to sustain the natural world for the benefit of people and wildlife.

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¹⁹ National Plastics Plan. 2021. Australian Government, Canberra.

²⁰ Department of Health. 2019. Guidance for public officials on interaction with the tobacco industry. Australian Government, Canberra.

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<p>This report has been prepared for the sole use of WWF-Australia, the client stated above, the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of Equilibrium OMG Pty Ltd (Equilibrium). The results and findings are based upon Equilibrium's professional judgement, experience and expertise, based upon the reliance of information used to prepare this report. Equilibrium has limited its assessment to the scope agreed upon with its client.</p>	

Executive Summary

The World Wide Fund for Nature Australia (WWF-Australia) engaged Equilibrium to investigate potential solutions to the environmental problem of cigarette filter and butt litter.¹ Equilibrium reviewed domestic and international initiatives, interviewed stakeholders, developed and assessed policy options, and documented the findings.

Cigarette filters and butts create a range of negative environmental impacts that, despite sustained efforts, prove stubbornly difficult to eradicate. An estimated 17.8 billion cigarettes are consumed each year and studies indicate that 30-50% of the butts may end up as litter. While declining smoking rates reduce litter, they remain the most littered item in Australia (by number).

Once littered, butts have a range of negative environmental impacts. Most notably, plastic filters accumulate in waterways and the marine environment. Once there, they leach toxic chemicals and decompose into microfibres that may be ingested by marine life.

Internationally, efforts to reduce cigarette butt pollution are gaining traction. Many solutions comprise product stewardship schemes, requiring the tobacco industry to take responsibility for their products from production through to disposal.

In March 2021 the Australian Government released Australia's first National Plastics Plan. It included a commitment to initiate a cross-sectoral stewardship taskforce to reduce cigarette butt litter in Australia and to consider potential stewardship schemes.

The cost to the Australian economy of tobacco-related waste and litter management is estimated to be about \$73 million per year. This cost is currently met by state and local governments, and ultimately taxpayers and ratepayers. In addition, community and environmental groups voluntarily collect hundreds of thousands of cigarette butts annually.

A levy of less than one half of one cent (AUD \$0.004) for each cigarette consumed in Australia would generate sufficient funds (approximately \$71m per year) to cover current annual waste and litter management costs. This would represent an increase of just 0.2% on the cost of each cigarette. Additional funds may need to be raised to administer, manage and communicate cigarette butt reduction programs.

This study finds that:

- In the absence of a new approach, current levels of littering and cigarette butt pollution will persist, decreasing slightly over time in line with declining smoking rates.
- A mandated national product stewardship scheme, similar to the EU's extended producer responsibility legislation, and/or a national ban on plastic filters is likely to have the greatest impact in reducing butt pollution.
- The product stewardship approach most likely to deliver significant environmental benefits is a nationally mandated scheme led by the Australian Government.
- A levy of \$0.004 (less than one half of one cent) per cigarette would raise sufficient funds to scale up and harmonise cigarette butt clean-up efforts and operate a product stewardship scheme. Other funds may be needed to support butt litter reduction programs.

¹ A cigarette butt is defined as that part of the cigarette thrown away after the smoker has finished smoking it (Collins English Dictionary definition). The filter, also called a filter tip, is made of non-biodegradable plastic (cellulose acetate).

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- A levy of \$0.004 cents per cigarette would increase the average cost of a pack of 20 cigarettes from \$35.00 to \$35.08.
- The combined effect of current actions and proposed interventions could potentially more than halve (reduce by around 4.5 billion butts) the amount of plastic butt litter in the environment and significantly alter littering behaviour.

Recommendations

The Australian Government should:

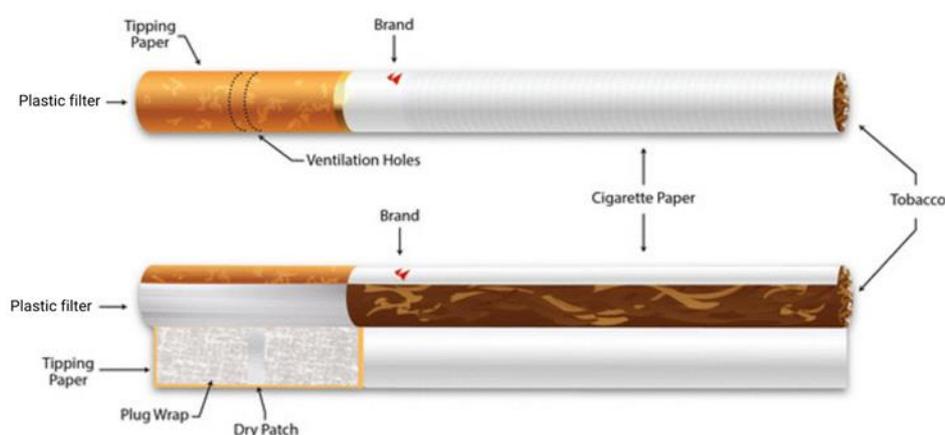
1. Place cigarette butts/filters on the product stewardship priority products and projects list for 2021-22.
2. Establish and activate a government-led, cross-sectoral task force to reduce cigarette butt litter in Australia and consider potential stewardship schemes. The task force should include environmental expertise.
3. Via the task force, engage with the Product Stewardship Centre of Excellence to determine best-practice components of a cigarette butt product stewardship scheme.
4. Examine, with health officials, the viability and impact of removing plastic filters, and investigate the viability of biodegradable filters.
5. Consider options for funding the scheme, including imposing a levy per cigarette, or a levy paid directly by brand owners.
6. Undertake further product stewardship scheme development in partnership or at a minimum, close consultation with the states and territories.
7. Ensure product stewardship work is consistent with and complements broader laws and activities relating to tobacco control.

1 Problem overview

Cigarette filters are a ubiquitous single-use plastic product that poses a range of hazards in the natural environment. Cigarette butts are consistently the most littered item in Australia.² Of the 17.75 billion cigarettes sold each year, somewhere between one-third and a half (5.8-8.9 billion) end up as litter.³

Cigarette filters are made from plastic that does not biodegrade under normal circumstances.⁴ An estimated 90% of cigarettes are fitted with filters.⁵ The filters are composed of strands of cellulose acetate that can take up to 14 years to decompose.⁶ As they degrade, butts leach toxic materials and convert into microfibrils, posing an environmental threat to waterways and marine life.⁷

Figure 1: Anatomy of a cigarette⁸



Whether butts are deliberately littered or become litter inadvertently, such as being blown out of a bin, they ultimately get washed into drains and accumulate in the marine environment. There, marine life can ingest the plastic, and cigarette butt-derived leachate is toxic to marine and

²Clean Up Australia Rubbish Report 2020.

³Smith E.A., and Novotny T.E. 2011. Whose butt is it? Tobacco industry research about smokers and cigarette butt waste. *Tobacco Control* 20:i2-i9; Stigler-Granados P., Fulton L., Nunez Patlan E., Terzyk M. and T.E Novotny. 2019. Global Health Perspectives on Cigarette Butts and the Environment. *International Journal of Environmental Research and Public Health* 16(10):1858. Published 2019 May 26. doi:10.3390/ijerph16101858; Curnow, R. and Spehr, K. *Butt-littering behaviour in context: A foundation for the NSW EPA cigarette butt litter reduction program*; Black, S., Harwood, K., et al. 2020. *Plastic Revolution to Reality – A roadmap to halve Australia's single-use plastic litter*. BCG and WWF-Australia; Lyndhurst, B. *Rapid Evidence Review of Littering Behaviour and Anti-Litter Policies*. Zero Waste Scotland.

⁴Yadav, N. and Hakkarainen, M. 2021. Degradable or not? Cellulose acetate as a model for complicated interplay between structure, environment and degradation. *Chemosphere* Volume 265.

⁵EU Targets Cigarette Filters as part of Plastic Ban. 2019. EU Policies. Available at: <http://eu-policies.com/competences/climate/eu-targets-cigarette-filters-part-plastic-ban/> (Accessed January 2021)

⁶Joly, F. and Coulis, M. 2018. Comparison of cellulose vs plastic cigarette filter decomposition under distinct disposal environments. *Waste Management* Vol 72.

⁷Francisco Belzagui, F., Buscio, V., Gutiérrez-Bouzán, C. and M. Vilasec. 2021. Cigarette butts as a microfiber source with a microplastic level of concern. *Science of The Total Environment* Volume 762.

⁸Image adapted from *BMC Public Health*. Available at: https://www.researchgate.net/figure/Anatomy-of-a-Cigarette-Source-Peel-Public-Health_fig1_305519262 (Accessed January 2021)

freshwater species.⁹ New research also suggests that cigarette butts in the environment can hamper plant growth and germination success.¹⁰

Littered cigarette butts impose a considerable economic cost on the entire community. Data from numerous sources shows a clear trend – cigarette butts and packaging are among the largest contributors to litter by number.¹¹

Historically, Clean Up Australia, Keep Australia Beautiful and the Australian Marine Debris Initiative (AMDI) have consistently listed cigarette butts and packaging as the most littered item.¹² In 2018/19, cigarette litter comprised 21% of all debris collected by these three organisations.¹³ Some sources indicate a reduction in butts as a percentage of all litter,¹⁴ while others show little change in recent years.¹⁵

Clean-up activities and the maintenance of public spaces requires significant investment that is borne, for the most part, by local and state governments and therefore all ratepayers and taxpayers. Tobacco-related litter cost the Australian economy an estimated \$73m in 2014-15.¹⁶ Discarded cigarette butts have also been identified as a cause of bushfires, and may continue to be a fire hazard.¹⁷

⁹ Slaughter, E., Gersberg, R.M., Watanabe, K., Rudolph, J., Stransky, C. and T.E. Novotny. 2011. Toxicity of cigarette butts, and their chemical components, to marine and freshwater fish. *Tobacco Control* 20(Suppl 1), pp.i25-i29.

¹⁰ Green, D.S., Boots, B., Carvalho, J.D.S. and T. Starkey. 2019. Cigarette butts have adverse effects on initial growth of perennial ryegrass (gramineae: *Lolium perenne* L.) and white clover (leguminosae: *Trifolium repens* L.). *Ecotoxicology and Environmental Safety* 182, p.109418.

¹¹ Litter counts employ different methodologies, so results are not directly comparable.

¹² The Australian Marine Debris Initiative lists cigarette butts and filters as the second most common after 'plastic pieces – hard and solid', but of all recognisable products collected, tobacco-related waste is the most numerous.

¹³ Black, S., Harwood, K., *et al.* op. cit.

¹⁴ Clean Up Australia Day Rubbish Report. Annual Rubbish Report. 2019.

¹⁵ Keep Australia Beautiful. National Litter Index 2018/19.

¹⁶ This figure doesn't include all environmental costs, only litter removal. Tait, R. *Identifying the Social Costs of Tobacco Use to Australia in 2015/16*. 2019. National Drug Research Institute.

¹⁷ Chapman, S and Balmain A. 2004. *Reduced ignition propensity cigarettes: A review of policy relevant information*. Produced for the Commonwealth Department of Health.

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Chart 1. National Litter Index – Litter Item Count¹⁸

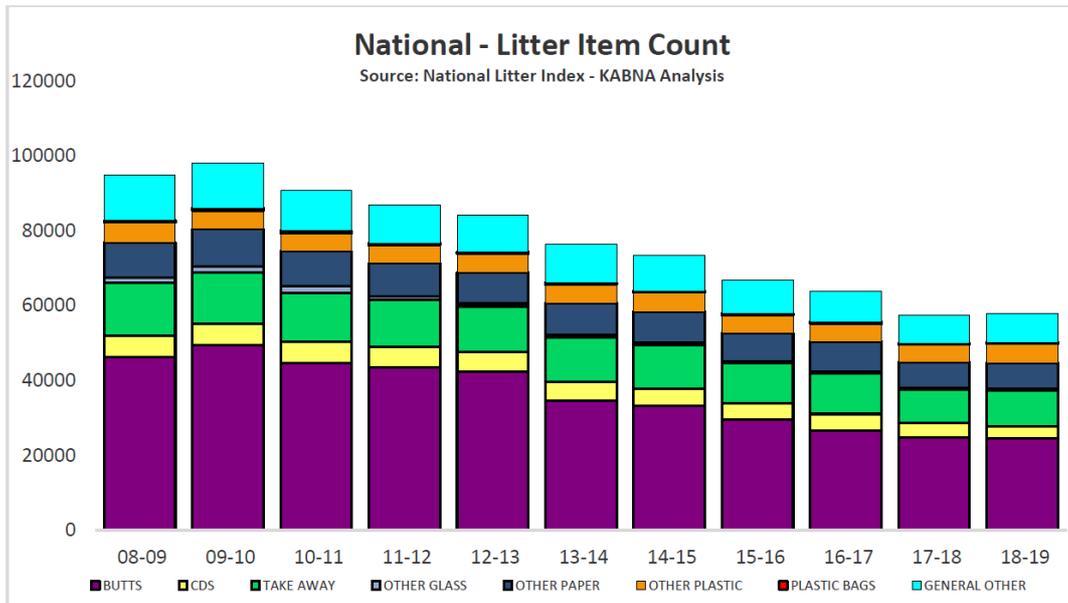
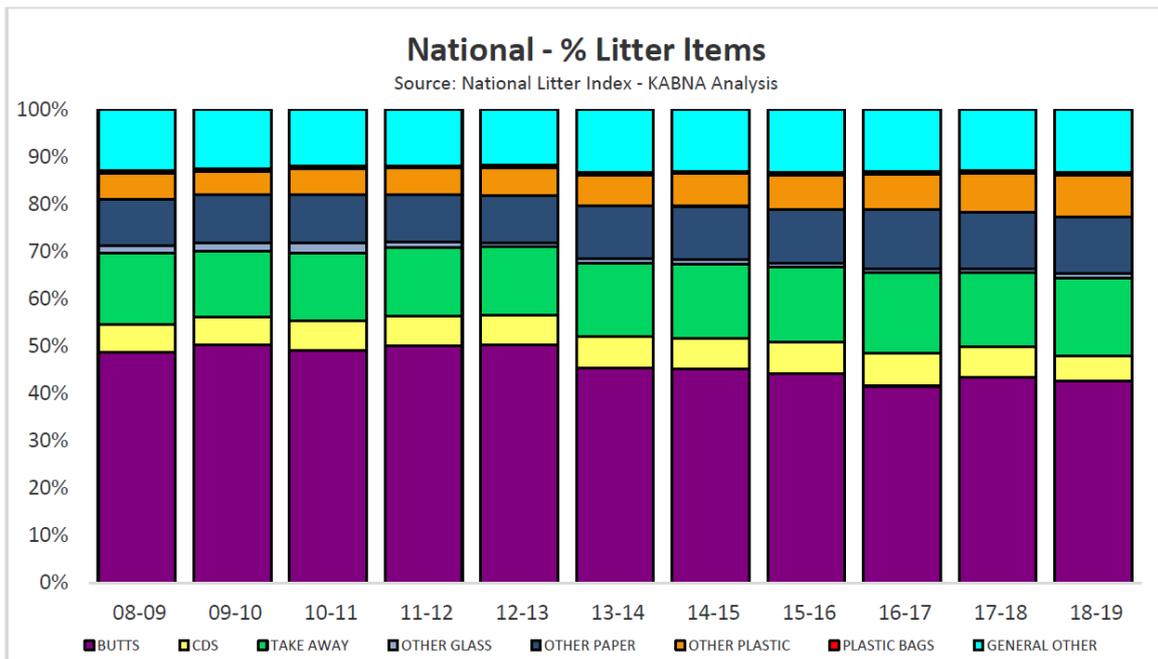


Chart 2. National Litter Index – Percentage Breakdown of Litter Items¹⁹



¹⁸ National Report 2018/19. National Litter Index. Keep Australia Beautiful National Association. 2019.

¹⁹ *ibid.*

Issues associated with cigarette filters

Cigarette filters were introduced in the 1950s²⁰ and presented as a means of reducing the harshness of cigarette smoke and the harmful effect of smoking. However, filters do not make smoking less harmful or safer.²¹ Filters have historically been used as a marketing tool, to recruit and retain smokers as consumers of these products.²² Some tobacco control advocates have recommended they be eliminated because they do not protect against the harms of smoking but, instead, encourage smokers to puff more frequently.^{23, 24}

There is some overlap between environmental and public health issues in relation to filters. For example, toxic leachates from butt litter in the environment pose a threat to human health via drinking water and their bioaccumulation in the food chain.²⁵

Despite the illegality of littering cigarettes, and its environmental impact, Australians continue to litter their cigarette butts. Previous research has estimated that around 2,800 tonnes of cigarette butt waste is generated in Australia each year, with around 1,400 tonnes becoming litter. This is the equivalent of around eight billion cigarette butts.²⁶

Estimated total cigarette consumption in Australia 2020

The Tobacco in Australia report found that smoking rates in Australia between 2010 and 2019 dropped from 15.9 to 11.6%, or by 27%. Taking population growth into account, the number of smokers in Australia is estimated to have declined from about 3.2m in 2010 to 2.9m in 2019 – a decrease of about 9.4%.²⁷

Self-reported cigarette consumption has declined from a mean 16 cigarettes per day in 2010 to 12.9 cigarettes per day in 2019 for males and females combined, representing a reduction of about 19%.²⁸

These factors, combined with illicit tobacco estimates, suggest that 17.75 billion cigarettes were consumed in Australia in 2020.²⁹

²⁰ Risks associated with smoking cigarettes with low tar machine-measured yields of tar and nicotine. 2001. *Tobacco Control* Monograph 13. National Cancer Institute. United States Department of Health and Human Services.

²¹ Harris, B. 2011. The intractable cigarette 'filter problem'. *Tobacco Control* 20(Suppl 1), pp.i10-i16.

²² Ibid.

²³ Novotny, T.E., Bialous, S.A., Burt, L., Curtis, C., Costa, V.L.D., Iqtidar, S.U., Liu, Y., Pujari, S. and E. Tursan d'Espaignet. 2015. The environmental and health impacts of tobacco agriculture, cigarette manufacture and consumption. *Bulletin of the World Health Organization* 93, pp.877-880.

²⁴ Novotny, T.E. 2020. Environmental accountability for tobacco product waste. *Tobacco Control* 29(2), pp.138-139.

²⁵ Greenhalgh, E.M., Scollo, M.M. and M.H. Winstanley. 2020. Tobacco in Australia: Facts and issues. Cancer Council Victoria, Melbourne. Available at: www.TobaccoInAustralia.org.au (Accessed December 2020)

²⁶ Black, S., Harwood, K., *et al.* op. cit.

²⁷ Australian Institute of Health and Welfare. Data tables: National Drug Strategy Household Survey 2019 - 2. Tobacco smoking chapter, Supplementary data tables. AIHW, Canberra, 2020. Available from: <https://www.aihw.gov.au/reports/illicit-use-of-drugs/national-drug-strategy-household-survey-2019/data>

²⁸ <https://www.tobaccoinaustralia.org.au/chapter-2-consumption/2-3-self-reported-measures-of-tobacco-consumption>

²⁹ Correspondence from Dr M. Scollo, senior policy adviser on tobacco at Cancer Council Victoria and editor of *Tobacco in Australia*, 22 July 2021.

2 Australian programs and activities

Across Australia, a range of programs seek to mitigate, reduce and even eliminate cigarette butt litter and its associated environmental impacts. Such programs are currently run by local and state governments and non-government anti-litter organisations. Current policy and programs continue to focus largely on solutions directed at the individual, such as disposal infrastructure and smoker education. While important, these have yet to have a significant impact on the issue.

Programs are funded and managed primarily by local, state and territory governments, along with environmental NGOs and anti-litter groups. The tobacco industry has previously funded and operated national campaigns and programs.

Programs and activities include:

- General littering laws and enforcement;
- Specific cigarette butt littering laws and enforcement;
- Awareness-raising campaigns;
- Education campaigns;
- Cigarette butt collection and disposal infrastructure; and
- Behavioural research.

Our research identified a range of programs that have been operating across the nation, however many have now concluded. Currently active programs are outlined in the following table.

Table 1. Summary of current programs

Organisation	Program name	Aim	Key outcomes	Current status
New South Wales EPA	Cigarette Butt Litter Prevention Program ³⁰	Reduce general public cigarette butt littering behaviour	The program includes guidelines and resources for stakeholders to tackle local cigarette butt litter hotspots	A new grants program and broader behaviour-change campaign
Local organisations, supported by Tangaroa Blue	Cigarette Butt Litter Source Reduction Plans, including the 'Ditch the Flick' campaign ³¹	Local strategies to stop a range of plastic items from entering the environment	Locally developed and implemented Source Reduction Plans result in a measurable decrease of butts in the environment	Ongoing

³⁰ Cigarette Butt Litter Prevention Grant Program. New South Wales Department of Planning, Industry and Environment. 2020.

³¹ Tangaroa Blue. 2020. Available at: <https://www.tangaroablue.org/source-reduction-plans/cigarette-butt-litter/> (Accessed May 2021)

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Organisation	Program name	Aim	Key outcomes	Current status
Keep Australia Beautiful Queensland	Butt Free Zone ³²	Encouraging businesses, venues and precincts to become 'butt-free zones'	Behavioural change programs involving councils that educate, inform and encourage smokers to "butt it, then bin it"	The town of Eumundi, on the Sunshine Coast, is seeking to become Queensland's first "Butt Free Town", with a number of venues participating in the program
Queensland Health	Creating Smoke-free Places ³³	Providing local government information and case studies to support the rollout of smoke-free places	Guidance material provides a practical approach to creating a smoke-free zone and supports research that Queenslanders value smoke-free zones	Queensland Health makes the guidelines available for free to local governments No further support is available at this time
The Only Butt	The Only Butt Litter Campaign ³⁴	Providing educational campaign material targeting the reduction of butt litter on Australian beaches	Organiser Josie Jones rolled out the scheme in July 2018 Research found the campaign resulted in a significant reduction in littering	Money donated to the campaign went towards ashtrays and anti-littering education
Clean Up Australia	High-profile litter clean-up events	Campaigns and awareness, including litter collection events ³⁵	Annual rubbish reports continue to identify cigarette butts as a major litter problem, as recorded by the annual Rubbish Reports	All cigarette butts collected are understood to be disposed of in landfill
Keep Australia Beautiful	National Litter Index/ litter clean-up projects ³⁶	Ongoing litter monitoring and tracking and community-led litter collection programs	Cigarette butts remain a major litter problem, as recorded annually in the index	All cigarette butts collected are understood to be disposed of in landfill

³² Butt Free Zone. Keep Australia Beautiful. 2020. Available at: http://www.keepqueenslandbeautiful.org.au/programs/butt_free_zone/info (Accessed January 2020)

³³ Creating smoke-free places: A guide for Queensland local governments. State of Queensland (Queensland Health). 2020.

³⁴ The Only Butt Litter Campaign. The Only Butt. 2020. Available at: <https://www.theonlybutt.com/> (Accessed January 2021)

³⁵ Clean Up Australia: Cigarette Butts. 2020. Available at <https://www.cleanup.org.au/cigarette-butts> (Accessed December 2020)

³⁶ Keep Australia Beautiful: Cigarette Butts. 2020. Available at <https://www.kabc.wa.gov.au/resources/litter-information/cigarette-butts> (Accessed December 2020)

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Organisation	Program name	Aim	Key outcomes	Current status
TerraCycle Australia	Butt Litter Collection ³⁷	Public collection of cigarette butts	The program collected 10.5m butts for recycling in two years ³⁸	No longer industry funded. Currently supported by a small number of local governments, including Waverley and Byron Bay

Previous programs

Extensive research has been completed to understand smokers' behaviours, attitudes and knowledge towards butt disposal. A qualitative analysis suggests personal ashtrays could play a greater role in butt litter reduction in future. Additional bin infrastructure is required, but motivation to use it also needs to be increased.³⁹

In 2007, Sustainability Victoria launched the 'Don't be a Tosser – Bin Your Butts' campaign, which focused on education. Venues were responsible for the provision of bins and on-site messaging.⁴⁰ Sustainability Victoria provided a budget of \$2.15m to introduce the Litter Hotspots Program in 2013, which took a catchment-wide partnership-building approach to reducing litter in all waterways entering Port Phillip Bay. The program saw a 96.8% reduction in litter at 436 sites.⁴¹

In the City of Greater Dandenong, a butt litter campaign commenced in 2016 to communicate a 'No Butts About It' message that could be used anywhere in Australia. Using powerful media messages, posters and new infrastructure, it resulted in a more than 80% decline in the number of littered butts.⁴²

TerraCycle Australia initiated a program in 2014 to collect and recycle cigarette butts.⁴³ The program was funded by three Australian tobacco companies, but funding ended after a year. Further detail on this and other industry activities is provided below.

Councils, including Byron Bay and Waverley, continue to fund cigarette recycling through either freight programs or zero-waste boxes that are sent to TerraCycle US to be recycled.

Keep Australia Beautiful and Clean Up Australia are active across Australia and the butts collected go to landfill because it is too complex and costly to separate them from other litter.

³⁷ TerraCycle Australia. 2020. Available at: https://www.terracycle.com/en-AU/zero_waste_boxes/cigarette-waste-zero-waste-box-en-au (Accessed December 2020)

³⁸ Greenhalgh, E.M., Scollo, M.M. et al, *ibid*.

³⁹ Qualitative Research of Cigarette Disposal Behaviours. Hall and Partners in association with NSW EPA. 2017.

⁴⁰ Don't be a Tosser campaign report. Sustainability Victoria. 2020. Available at: <https://www.sustainability.vic.gov.au/Government/Litter-and-illegal-dumping/Dont-be-a-tosser-campaign-report> (Accessed December 2020)

⁴¹ A Catchment Approach: MWRRG and CLEAN Litter Network. Metropolitan Waste and Resource Recovery Group. 2017. Available at: <https://www.mwrrg.vic.gov.au/assets/resource-files/Litter-A-catchment-approach-new.pdf> (Accessed December 2020)

⁴² What are councils doing about cigarette litter? Clean Up Australia. 2020. Available at: <https://www.cleanup.org.au/what-are-councils-doing-about-cigarette-butt-litter> (Accessed January 2021)

⁴³ TerraCycle Australia. 2020. Available at: https://www.terracycle.com/en-AU/zero_waste_boxes/cigarette-waste-zero-waste-box-en-au (Accessed December 2020)

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Byron Bay Shire Council used a NSW EPA litter grant to implement a multifaceted litter campaign, with emphasis on the Cape Byron Marine Park. This included education in partnership with community groups, infrastructure, enforcement and monitoring. The council upgraded and expanded its existing butt bin network, replacing 27 bins in limited locations with 128 Enviropoles shire-wide. The Enviropole has a higher overall capacity, extinguishes the butt using a liquid medium, collects valuable data and allows the cigarette butts to be recycled via the council's partnership with TerraCycle. The council included beaches in its no-smoking areas, held six litter blitzes and enforced smoking bans in designated areas, but did not issue any fines. Monitoring over 12 months at 26 locations showed the number of smoking-related items collected per month fell from over 600 to less than 200.⁴⁴

In 2018, the NSW Government partnered with 16 local councils to trial a range of interventions to reduce cigarette butt littering. These increased butt binning rates by 53%.⁴⁵ For some strategies, a peak binning rate of 76% was achieved. In 2014, Sydney launched the YUK anti-butt campaign, which distributed 1,000 personal ashtrays to Neighbourhood Service Centres.⁴⁶

Local councils in Queensland are trialing a variety of methods for handling cigarette butt litter. In Cairns, geographic information system mapping that identified existing butt-bin locations was used to help determine new bin locations, promote existing smoke-free spaces and lead to a more strategic approach. Monitoring via the Customer Request System found a reduction in cigarette butt litter, and drop-in collection points reduced collection and maintenance costs.⁴⁷

In Mackay, 45 gross pollutant traps (GPT) have been installed where butts may enter the river system or ocean. A GPT monitoring program is being undertaken for a three-year period in collaboration with Reef Catchments Limited (a local NRM body) and the Cleanwater Group (a GPT manufacturer and maintenance operator).⁴⁸

Industry activities

There have been a range of industry activities in Australia in recent years. The industry reports that it has been working on the issue for decades and continues to do or support a range of work to reduce litter.⁴⁹

British American Tobacco Australia reports that it is a member of the Tobacco Industry Product Stewardship Group (TIPSG), which appears to be a separate organisation to the earlier Tobacco Industry Product Stewardship initiative. The TIPSG has the stated aim of addressing the social and environmental impacts of tobacco product litter.⁵⁰

⁴⁴ Tackling litter in Byron Shire. Byron Shire Council. 2020. Available at: <https://www.byron.nsw.gov.au/Projects-and-initiatives/Tackling-litter-in-Byron-Shire> (Accessed January 2021)

⁴⁵ Guide to prevent cigarette butt littering. State of NSW and NSW Environmental Protection Authority. 2020.

⁴⁶ City of Sydney launches anti-butt campaign. 2014. *Sustainability Matters*. Available at: <https://www.sustainabilitymatters.net.au/content/waste/news/city-of-sydney-launches-anti-butt-campaign-543431891> (Accessed December 2020)

⁴⁷ Creating smoke-free places: A guide for Queensland local governments. State of Queensland (Queensland Health). 2020.

⁴⁸ Ibid.

⁴⁹ British America Tobacco, ESG Report, 2019.

⁵⁰ Imperial Brands, Case study for the Australian Packaging Covenant Organisation, November 2020. (Accessed May 2021 at <https://www.imperialbrandsplc.com/sustainability/case-studies/behaving-responsibly-people-and-operations/reducing-packaging-impacts-in-australia.html>)

British American Tobacco Australia reports that the industry has identified and investigates closed-loop options and initiatives, but that none are currently considered feasible. It notes that, to date, all options are challenging due to factors such as the technical recyclability of the material and the relatively low volumes of materials. While these options are not currently feasible, it says the industry will continue to investigate them.

In the past, tobacco companies operating in Australia have directly supported and participated in litter-reduction campaigns. The Victorian Cancer Council online publication *Tobacco in Australia*⁵¹ provides information on the tobacco industry's response to environmental concerns in recent times, including the following examples.

British American Tobacco Australia reportedly committed \$2.8m over four years to education campaigns, starting in 2003. The funding was managed through the Butt Littering Trust. The company reported that between 2002 and 2012 the industry directly contributed more than \$5m to the trust and anti-litter education. The trust was rebranded as Butt Free Australia in about 2009. According to the Victorian Cancer Council, it was a self-described product stewardship organisation with a focus on education and reducing butt littering through social and behavioural research, awareness-raising and on-the-ground projects. The trust ceased activities in 2012 and the program was acquired by Keep South Australian Beautiful (KESAB) environmental solutions. A website is currently live (see <http://www.buttfree.org.au/>) and provides access to support materials, such as posters.

Tobacco in Australia reports that there is little evidence suggesting Butt Free Australia has had any demonstrable impact. It states that, in 2006, the New South Wales Department of Environment and Conservation noted that activities and projects funded by cigarette manufacturers had '*not translated into widespread reduction of cigarette butt litter*'.⁵²

Further to this, Imperial Brands/Imperial Tobacco Australia and Philip Morris Australia have sponsored butt littering reduction programs with Keep Australia Beautiful and KESAB environmental solutions. Support has predominantly involved funding litter surveys, advertising and educational campaigns, butt bins, posters, stickers and personal ashtrays.

Tobacco companies are also reported to have formed the Tobacco Industry Product Stewardship Initiative in 2014. The initiative's stated intention is to support efforts to reduce cigarette litter, and promote butt recovery and recycling. The product stewardship initiative partnered with service provider TerraCycle Australia and encouraged the public to collect and send cigarette butts to TerraCycle, which would recycle the butts and donate two cents per kilogram to a school or charity. Funding was apparently stopped in late 2015 and the program reportedly collected 10.5m butts in two years.

3 International programs and activities

The tobacco industry is highly globalised, with an estimated 5.7 trillion cigarettes smoked around the world in 2016.⁵³ International research and analysis estimates that between one-third and two-

⁵¹ Greenhalgh, E.M., Scollo, M.M. et al, *ibid*.

⁵² *Op. cit.*, chapter 10, 10.16.2 – Tobacco industry response to environmental concerns.

⁵³ Drope, J., Schluger, N., Cahn, Z., Hamill, S., Islami, F., Liber, A., Nargis, N. & Stoklosa, M. 2018. *The Tobacco Atlas*. Atlanta: American Cancer Society and Vital Strategies.

thirds of all cigarettes smoked are tossed into the environment, comprising by far the largest single type of litter by count (about 30-40% of all items picked up) in coastal and urban clean-ups.⁵⁴

Globally, there is growing recognition of the environmental harm caused by cigarette butts, which is building traction towards reform. Increasing knowledge of the harm caused by cigarette filters is also driving efforts by governments and NGOs to hold tobacco companies responsible for managing tobacco product waste.

Most options are grounded in the principle of Extended Producer Responsibility (EPR), which holds tobacco companies accountable for the full life cycle costs of tobacco product waste⁵⁵ (see discussion on EPR and product stewardship in Section 4).

Table 2 provides a summary of legal and regulatory measures under development or in force in other international jurisdictions, with further details provided in sections 3.1 to 3.3.

Table 2. Summary of international programs

Country/region	Type of intervention	Description	Objectives/targets	Current status
England	Potential regulation (Environment Bill)	Regulatory extended producer responsibility scheme for cigarette butts ⁵⁶	Requires the tobacco industry to meet the full cost of tobacco waste disposal	Currently before Parliament (passed by the House of Commons, currently with the House of Lords)
European Union	Regulation (Directive EU 2019/904)	Promotes circular economy principles to eliminate and reduce single-use plastics through restrictions, labelling, product requirements and extended producer responsibility ⁵⁷	Member states shall ensure that extended producer responsibility schemes are established for a number of single-use plastic products, including tobacco filters	In force and became law in the EU countries in July 2021
New Zealand	Ban on filters	Proposals for a Smokefree Aotearoa 2025 Action Plan include a proposal to prohibit filters on	Reduce the appeal of smoking and a key source of plastic pollution	Consultation prior to final decisions on measures to be included in the Smokefree Aotearoa Plan 2025

⁵⁴ *Plastic Revolution to reality – A roadmap to halve Australia’s single-use plastic litter*. 2020. WWF and Boston Consulting Group.

⁵⁵ Hoek, J., Gendall, P., Blank, M.L., Robertson, L. and Marsh, L., 2020. Butting out: an analysis of support for measures to address tobacco product waste. *Tobacco Control* 29(2), pp.131-137.

⁵⁶ UK Department for Environment, Food & Rural Affairs, and Department of Health and Social Care. March 30, 2021. Government explores next steps to clean up tobacco litter in England. Media release.

⁵⁷ Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. 2019. *Official Journal of the European Union*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904> (Accessed December 2020)

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		smoked tobacco products ⁵⁸		
USA – California	Regulation (Senate Bill 424)	The bill would ban the sale of single-use tobacco products, and require multi-use products to be recyclable or collected through take-back schemes	Manufacturers required to collect filters and send those components to the appropriate recycler, or to reimburse household hazardous waste collection facilities for costs to collect and recycle	The bill was introduced in February 2019 and referred to two Senate committees but is currently classified as inactive ⁵⁹
USA – New York	Regulation (Senate Bill S1278)	The Tobacco Product Waste Reduction Act will place a ban on the sale of filtered cigarettes and single-use filters ⁶⁰ and enforce fines on sales	Minimise harm caused by butt litter in the environment	Introduced in 2019 and currently with the Health Committee. If passed, will commence in 2022
USA – Federal	Regulation (H.R.5845)	The Break Free From Plastic Pollution Act would regulate extended producer responsibility for single-use plastic items, including cigarette filters ⁶¹	To ensure manufacturers participate in product stewardship programs for the collection and recycling of products	The act was introduced in February 2020 but has been largely overshadowed by the COVID-19 pandemic. The act remains pending in U.S. Congress
USA – TerraCycle	Voluntary program	Industry-led program to recycle cigarette butt litter, ⁶² predominantly supported by the Santa Fe Natural Tobacco Company	Cigarette butts collected through the program are recycled into a variety of products, including plastic pellets	Reportedly active in over 50 cities across the USA

⁵⁸ Government of New Zealand, proposals for a Smokefree Aotearoa 2025 Action Plan. <https://www.health.govt.nz/publication/proposals-smokefree-aotearoa-2025-action-plan>

⁵⁹ SB-424 Tobacco products: single-use and multiuse components. California Legislative Information. 2019. Available at: https://leginfo.ca.gov/faces/billStatusClient.xhtml?bill_id=201920200SB424 (Accessed December 2020)

⁶⁰ Senate Bill S1278. An act to amend the public health law, in relation to enacting the Tobacco Product Waste Reduction Act. State of New York. 2021.

⁶¹ H.R.5845 – Break Free From Plastic Pollution Act of 2020. Senate and House of Representatives of the United States of America, 116th Congress (2019-2020). 2020.

⁶² Cigarette Waste Recycling Program. TerraCycle US. Available at: <https://www.terracycle.com/en-US/brigades/cigarette-waste-recycling> (Accessed December 2020)

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Canada	Voluntary program	Industry-led partnership between TerraCycle and Imperial Tobacco to develop the Cigarette Waste Recycling Program ⁶³	Cigarette butts collected through the program are recycled into a variety of products, including plastic pellets, and it also seeks to educate on the importance of recycling	The program remains active
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3.1 England

Ministers are considering introducing a regulatory extended producer responsibility scheme for cigarette butts in England. Provisions to establish schemes are included in the Environment Bill currently before the House of Lords.

3.2 Europe

The European Commission Directive (EU) 2019/904 (Single-Use Plastic Directive) promotes circular approaches and waste prevention.⁶⁴ Single-use plastic items covered include tobacco products with filters, and filters intended for use in tobacco products.

The Single-Use Plastic Directive stipulated to member states that they should bring into force the laws, regulations and administrative provisions necessary to comply with the directive by 3 July 2021. Marking requirements specified for member states are to ensure that tobacco filters placed on the market bear a label on their packaging informing consumers of the following:

- Appropriate waste options for the product; and
- The presence of plastics in the product and the resulting negative impact of littering.

The directive outlines that member states shall ensure that extended producer responsibility schemes are established for a number of single-use plastic products, including tobacco filters. It requires member states to ensure that tobacco filter producers cover at least the costs of the awareness-raising measures, litter clean-ups, data gathering and reporting.

It is envisaged that EPR programs may also require cigarettes to contain biodegradable filters, fine smokers who litter cigarette butts and expand smoke-free outdoor areas. However, most member states continue to focus on their COVID-19 response at this time. More detail of implementation strategies is expected in the future.

3.3 New Zealand

The Smokefree Aotearoa 2025 Action Plan includes a suite of measures aimed at reducing the appeal of smoking, including a potential ban on filters in smoked tobacco products. The NZ

⁶³ Cigarette Waste Recycling Program. TerraCycle Canada. 2020. Available at: <https://www.terracycle.com/en-CA/brigades/cigarette-waste-en-ca> (Accessed January 2021)

⁶⁴ Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment. *Official Journal of the European Union*. 2019. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904> (Accessed December 2020)

Government's Regulatory Impact Statement cites the following benefits: speed of implementation, making cigarettes harsher (and therefore less appealing), and removal of a source of toxic litter and microplastics from the environment. The action plan also aims to stifle product design, by preventing new features aimed at increasing the appeal of smoking, such as crush balls that deliver a burst of flavour.⁶⁵

3.4 United States of America

Some parts of the USA have banned smoking on beaches, in what many see as a first step in controlling butt waste, but not a way to eliminate it from beaches and cities. For example, the Smoke Free Air Act 2006 in New Jersey, which eliminated tobacco use in bars and restaurants, was amended in 2019 to include beaches, local parks and waterways.⁶⁶ Fines for violations can increase up to \$1,000 for repeat offenders.

California

Senate Bill 424 addresses tobacco waste and specifically targets plastic filters by banning the sale of single-use tobacco products and requiring multiuse tobacco products (i.e., e-cigarettes) to be recyclable or collected for take-back by tobacco product manufacturers. Under the bill, manufacturers may form a stewardship organization.⁶⁷

The bill requires manufacturers to collect permitted recyclable filters and send them to the appropriate recycler, or to reimburse household hazardous waste collection facilities for the costs of collecting and recycling these components.

Manufacturers may collect butts through either take-back collection bins that they make available at every location that sells its tobacco products or through a mail-back program that uses safe-for-handling containers that they provide.

State legislature indicates the bill is inactive, requiring majority vote.⁶⁸

New York

The Tobacco Product Waste Reduction Bill was introduced in 2019 and would effectively ban the sale of filtered cigarettes, attachable single-use filters and single-use e-cigarettes from 2022.⁶⁹ Sale of the items could result in a fine, depending on the number of offences and number sold.

The bill is justified on the basis that cigarette filters do not improve the safety or health of cigarettes, and that cigarette butts are also a plastic product that significantly contributes to

⁶⁵ New Zealand Ministry of Health. Proposals for a Smokefree Aotearoa 2025 Action Plan and Impact Summary: Proposals for a Smokefree Aotearoa 2025 Action Plan. 2021.

⁶⁶ New Jersey Senate Bill 1056 (2018-2019). 2019. Available at: <https://legiscan.com/NJ/text/S1056/id/1696183> (Accessed December 2020)

⁶⁷ SB-424 Tobacco products: single-use and multiuse components. California Legislative Information. 2019. Available at: https://leginfo.ca.gov/faces/billStatusClient.xhtml?bill_id=201920200SB424 (Accessed December 2020)

⁶⁸ SB-424 Tobacco products: single-use and multiuse components. California Legislative Information. 2019. Available at: https://leginfo.ca.gov/faces/billStatusClient.xhtml?bill_id=201920200SB424 (Accessed December 2020)

⁶⁹ Senate Bill S1278. An act to amend the public health law, in relation to enacting the Tobacco Product Waste Reduction Act. State of New York. 2020.

pollution in waterways and beaches, impacting the health of fish and other wildlife, as well as the safety of food consumed by humans.⁷⁰

US Bill – Break Free From Plastic Pollution

Federal lawmakers in February 2020 introduced the Break Free From Plastic Pollution Act. It enshrines extended producer responsibility for plastic bottles, packaging and plastic cigarette filters.⁷¹

The act would place the burden on manufacturers of packaging, food service products, paper and certain single-use products to minimise or eliminate waste from the products' life cycle by participating in product stewardship programs. It sets forth performance targets that the programs must meet, including ensuring products are recycled or otherwise appropriately managed.

Senators have recently started urging states to use the act as a blueprint for passing state legislation to reduce plastic waste. However, it has largely been overshadowed by the effects of the coronavirus pandemic, and the bill is still pending in the U.S. Congress.

Industry-funded recycling

TerraCycle runs a cigarette butt recycling scheme in the USA that is funded predominantly by the Santa Fe Natural Tobacco Company. Cigarette butts are collected by individuals, local governments, community groups, hospitality venues and businesses and sent to TerraCycle for recycling.

The process requires the separating of organic material from the filter, for composting and use as fertiliser. The plastic component is pulverised into a powder that is used as an alternative to sawdust in construction and building materials, where there is reportedly market demand.

The scheme was rolled out in approximately 50 U.S. cities in 2017 and aims to recycle 500m butts by 2025. Since commencing in 2012, around 250m butts have been collected in a range of disposal receptacles, and TerraCycle donates \$1 to Keep America Beautiful for every pound of waste collected. Education is a core component of the program.

3.4 Canada

In 2012, Canada became the first country to adopt an innovative industry-led program to recycle cigarette butt litter. TerraCycle partnered with Imperial Tobacco to develop the Cigarette Waste Recycling Program, which streamlines cigarette butt collection and disposal.

The waste is recycled into a variety of industrial products, such as plastic pallets, and any remaining tobacco is recycled as compost. Participants receive TerraCycle points that can be

⁷⁰ Green, A.L.R., Putschew, A. and T. Nehls. 2014. Littered cigarette butts as a source of nicotine in urban waters. *Journal of Hydrology* 519, pp.3466-3474.

⁷¹ H.R.5845 - Break Free From Plastic Pollution Act of 2020. The United States of America. Available at: <https://www.congress.gov/bill/116th-congress/house-bill/5845>

redeemed for charitable donations and this has raised over \$75,000 for charities across Canada. In 2018, they celebrated recycling over 100m butts.⁷²

Education is a core component of the program, and partnering with other programs and charities has boosted participation rates. TerraCycle teamed up with the Great Canadian Shoreline Cleanup (a conservation partnership between WWF-Canada and Ocean Wise) to run large-scale clean-up events.

Other schemes include the Butt Blitz, which Greener Future hosts – a nationwide program dedicated to cleaning up cigarette litter. Volunteers collected 560,432 cigarette butts from Canadian shorelines in 2018.

4 Potential solutions

Reducing or eliminating cigarette filter and butt litter in Australia has, to date, largely focused on solutions directed at the individual smoker, such as disposal infrastructure, awareness-raising and education. While these efforts have resulted in some improvements and reductions in butt litter, further intervention is sorely needed to address the problem, otherwise the negative environmental impacts will persist.

Solutions would support the National Waste Policy Action Plan, with its ambition to ‘reduce the impact of plastics on the environment and oceans’, as well as have environmental, social and economic benefits.⁷³ Drawing on successful interventions and evidence internationally, the Australian Government and other stakeholders could consider the following alternatives.

4.1 Product stewardship

Product stewardship and/or extended producer responsibility (EPR) is one of the key policy and regulatory measures to address the environmental impacts of cigarette butts.

While product stewardship and EPR are terms sometimes used interchangeably, they are different. As the Australian Government notes, product stewardship involves a shared responsibility for managing the impacts of products and materials throughout their life cycle on the environment, human health and safety. In contrast, EPR places primary responsibility on the producer, importer and seller to fund activities to reduce the environmental, health and safety impacts.⁷⁴

Both product stewardship and EPR are commonly legislated or regulated approaches internationally. In Australia, however, such approaches have more commonly been voluntary. Product stewardship for cigarette butts means industry taking responsibility for resolving the environmental problems its products create.

⁷² TerraCycle Canada celebrates 100 million cigarette butts recycled. 2018. Available at: <https://www.recyclingproductnews.com/article/28778/terracycle-canada-celebrates-100-million-cigarette-butts-recycled> (Accessed December 2020)

⁷³ National Waste Policy Action Plan. Australian Government and State and Territory Governments and the Australian Local Government Association, 2019.

⁷⁴ Australian Government National Waste Report 2013. See <http://www.environment.gov.au/protection/waste/publications/national-waste-reports/2013/product-stewardship>

In practical terms, product stewardship for cigarette butts means industry supporting, funding or otherwise enabling:

- Enhanced infrastructure to reduce litter;
- Increased clean-up of litter;
- Butt take-back and recycling; and
- Better cigarette butt design to lower environmental risks.

Product stewardship is generally founded on a shared responsibility, and secures involvement from a diverse range of parties to address problems arising from a product in the market.⁷⁵ The problem can be across the entire life cycle of a product (such as removing specific troublesome components or materials, design for reuse or recycling, or extended function and life) or more focused on end-of-life management (such as diversion from landfill, increased recovery and recycling, and reduced litter).

The core principle is that the producer takes primary responsibility for addressing negative environmental impacts and human health risks associated with its product. It is then incumbent on them to work across the supply chain to engage others to take action in their area of capability and responsibility.

While cigarette butt litter remains a major litter priority across Australia for Keep Australia Beautiful, Clean Up Australia and the Tangaroa Blue Foundation, current littering laws and other programs to address it have clearly not had a significant impact. New approaches and methods are needed, and product stewardship could be a highly effective means of initiating a new round of actions. It would require the tobacco industry to take greater responsibility for reducing litter and its associated negative environmental impacts.

The tobacco industry operated a product stewardship program – Butt Free Australia – that included behavioural change programs designed to educate, inform and encourage smokers not to litter. However, it has not been operational since about 2014.

Since then, there has been renewed activity around product stewardship in Australia. The Australian Government has made a range of commitments to advance and support the development of schemes, including funding the development of 15 industry-led voluntary schemes and establishing the Product Stewardship Centre of Excellence.

In March 2021 it released the National Plastics Plan 2021, which contains a commitment to initiate an industry-led cross-sectoral stewardship taskforce to reduce cigarette butt litter and consider potential stewardship schemes. State governments are also enacting a range of product stewardship programs, such as container deposit schemes to address beverage container litter, and actions on the sale and use of certain single-use plastics.

Internationally, product stewardship has been used to address upstream issues (such as the removal of toxic substances) as well as end-of-life product management, whereas product stewardship in Australia is more focused on end-of-life waste reduction and recycling. Product

⁷⁵ Curtis, C., Collins, S., Cunningham, S., Stigler, P. and T.E. Novotny. 2014. Extended producer responsibility and product stewardship for tobacco product waste. *International Journal of Waste Resources* 4(3).

stewardship overseas is commonly regulated and mandated by governments, whereas Australia has historically seen a greater use of industry-led voluntary schemes. Under our Recycling and Waste Reduction Act 2020 (which incorporates the old Product Stewardship Act 2011) there are also options for mandatory and co-regulatory schemes.

The industry in Australia currently has a Tobacco Industry Product Stewardship Group, with the stated purpose of tackling the social and environmental impacts of tobacco product litter. It is not clear whether this group is active and what, if any, programs are operating.

Product stewardship scheme options

When considering the effectiveness of a product stewardship approach, it is necessary to assess the types of schemes available. Options that could be considered include:

I. Industry-led voluntary approach

Under a voluntary approach to product stewardship, producers of cigarettes and filters are encouraged to join a group and take collective action to address cigarette butt littering. An industry association and/or a product stewardship organisation is needed to take the lead in developing and implementing such a program.

As noted, a Tobacco Industry Product Stewardship Group already exists and the industry did operate Butt Free Australia. However, the New South Wales Department of Environment and Conservation found that activities funded by cigarette manufacturers had '*not translated into widespread reduction of cigarette butt litter*'.⁷⁶

Industry-led voluntary schemes in Australia are generally considered to be easier to establish and more efficient to manage, however, they can also suffer from poor participation rates and having free riders (where companies can benefit from schemes despite not being a scheme member or participant). It remains unclear whether this approach would be consistent with the World Health Organization's Framework Convention for Tobacco Control (FCTC), to which Australia is a signatory.

II. Co-regulatory scheme (national)

Under the Recycling and Waste Reduction Act 2020, the Australian Government can establish a co-regulatory arrangement, whereby industry players lead and operate a product stewardship scheme for improved environmental and human health outcomes related to a product (in this case cigarette butts).

Such a program is underpinned by regulations that seek to establish a case whereby liable parties either (i) join in the industry-led program, (ii) undertake their own equivalent program, or (iii) are subject to prosecution and fines for failing to meet the requirements. There is currently one co-regulatory scheme operating under the act in Australia – the National Television and Computer Recycling Scheme.

Co-regulatory schemes are generally seen as complex and costly to manage but ensure broader participation by liable parties and reduce the risk of free riders. However, this approach is not

⁷⁶ Department of Environment and Conservation NSW. NSW extended producer responsibility priority statement 2005-06, Sydney, NSW.

consistent with Australian Government guidelines on government engagement with the tobacco industry under the FCTC, and therefore likely to be unviable.⁷⁷

III. Regulated scheme (national)

Under the Recycling and Waste Reduction Act 2020 the government can establish a mandatory regulated scheme⁷⁸. The act sets out that such a scheme can require liable parties to undertake certain actions, or avoid certain actions, in order to improve the environmental and human health outcomes for a particular product.

There are currently no mandatory regulated schemes in operation under the act. Mandatory schemes do operate under other legislation. Nationally, this includes the Product Stewardship for Oil Scheme and, at a state and territory level, the various container deposit schemes and bans on certain materials, such as e-waste and single-use plastics.

IV. Regulated scheme (states and territories)

States and territories could enact their own localised product stewardship approaches for cigarette butts. While perhaps not optimal in terms of participation, coverage and efficiency, such approaches may nonetheless align with existing and pending activities.

For example, most states and the Australian Capital Territory have or are banning certain single-use plastics in order to reduce littering and plastics in the marine environment.

Further, all states and territories either have or are in the process of establishing container deposit schemes. These are a form of regulated product stewardship as they raise a levy on the sale of specified beverage products and their containers, and require the beverage industry to take specific steps to facilitate the take-back and recycling of the used containers, including refunding a deposit to the person who returns them.

4.2 Ban on plastic filters

A national ban on plastic cigarette filters would have the highest potential impact because it removes the plastic part of the product that has the most significant negative environmental impacts. As noted, there are international efforts seeking to ban the use of single-use cigarette filters as a means of improving environmental outcomes.

From a health perspective, claims that filtered cigarettes were somehow “healthier” were found to be fraudulent. The World Health Organization notes that filters may actually make smoking easier and less harsh, increasing the risk of addiction.⁷⁹ Some tobacco control advocates argue that if filtered cigarettes were no longer available, this could reduce smoking rates, particularly initiation among children.⁸⁰

⁷⁷ Australian Government. Guidance for public officials on interacting with the tobacco industry, 2019.

⁷⁸ Product Stewardship Act. Australian Government. 2011. Available at: <https://www.legislation.gov.au/Details/C2011A00076> (Accessed December 2020)

⁷⁹ Novotny, Thomas E, Bialous, Stella Aguinaga, Burt, Lindsay, Curtis, Clifton, Luiza da Costa, Vera. et al. 2015. The environmental and health impacts of tobacco agriculture, cigarette manufacture and consumption. *Bulletin of the World Health Organization*, 93 (12), 877 - 880. World Health Organization.

South Australia, Queensland, Western Australia, New South Wales, Victoria and the Australian Capital Territory have or are in the process of banning certain single-use plastics. These mechanisms do not currently include cigarette filters but some could easily be expanded, through regulation, to add further products and materials.

Provisions also exist to introduce a national ban on plastic filters. Powers exist under the Recycling and Waste Reduction Act 2020, whereby a product stewardship scheme can be mandated to “...prohibit (either absolutely or subject to conditions), limit, restrict or otherwise affect the manufacture, import, export, distribution or use of the product and or prohibit (either absolutely or subject to conditions), limit or restrict substances from being contained in the product”.

A ban on plastic filters could therefore be incorporated into any potential product stewardship scheme. Further research and cross-sectoral consultation – particularly with public health bodies and tobacco control advocates – would be required to inform such a decision.

4.3 Substitution or redesign

Biodegradable filters, that would degrade in the environment and therefore not pose a litter problem or threat to marine ecosystems and animals, are presented as a potential solution. However, this could signal that butt littering is an acceptable practice.⁸¹ Further, the extent of degradability can be complex, and materials that do not break down as designed may continue to be an environmental problem.

Biodegradable products are in development and currently on the market, but remain in the niche and emerging category. Several companies in the U.K. and the U.S. produce or have patented and tested filters comprising cellulose or a mix of flax, cotton and hemp. Such compostable filters could theoretically reduce the environmental impact of butt waste.

But even with starch-based composition they will take time to degrade and would still release toxic filtrates into the environment when they do.⁸² While research is sparse, one study found a significant difference between the decomposition rates for cellulose filters (2.5-13 years) and cellulose acetate (7.5-14 years).⁸³

5 Impact assessment

An impact assessment is a high-level analysis of the likely effect of different approaches to reducing negative environmental impacts, in this case cigarette butt litter.

It identifies the options and solutions for intervention, and then assesses the regulatory, economic, market, consumer and environmental factors related to each option to determine potential outcomes, including:

⁸¹ Evans-Reeves K., Lauber K. and R. Hiscock. The ‘filter fraud’ persists: the tobacco industry is still using filters to suggest lower health risks while destroying the environment. *Tobacco Control*. Published Online First: 26 April 2021.

⁸² Novotny, T.E., Lum, K., Smith, E., Wang, V. and R. Barnes. 2009. Cigarette butts and the case for an environmental policy on hazardous cigarette waste. *International Journal of Environmental Research and Public Health* 6(5), pp.1691-1705.

⁸³ Joly, F-X. and Coulis, M. 2018. Comparison of cellulose vs. plastic cigarette filter decomposition under distinct disposal environments. *Waste Management* Volume 72, 349-353.

- Ease of implementation;
- Difficulty of ongoing operation;
- Cost impacts;
- Equity and distribution of financial impacts;
- Potential consumer participation;
- Market coverage;
- Impact on marine environments; and
- Impact on land and human health.

This assessment tests whether a potential solution is likely to have a significant impact on reducing cigarette butt litter or not, and ranks the different options.

5.1 Potential solutions

The following options were subject to impact assessment. Note that options two and three are likely to be unviable given restrictions on interacting with the tobacco industry, in line with the FCTC. They have been included to provide a thorough analysis and range of options for future adoption.

Table 3. Summary of options and potential solutions

Options	Description
1. Business as usual	No new program or scheme. Current programs and activities continue.
2. Voluntary, industry-led product stewardship (national)	Industry takes responsibility and raises funds to operate a program to engage consumers, educate, incentivise and otherwise provide the means for people to stop littering, and return butts for recovery and recycling. Potentially the same or similar model to Butt Free Australia. Educational campaigns that highlight the environmental impact of littering through social and behavioural research, awareness-raising initiatives, resource developments and on-the-ground projects. Industry organises collection points for the recovery and recycling of cigarette butts through authorised recyclers.
3. Co-regulatory product stewardship scheme (national)	Co-regulatory scheme under the Recycling and Waste Reduction Act 2020. Operated by industry and regulated by the Australian Government. Outcomes include a mix of approaches, including education, infrastructure for collection, awareness campaigns, litter pick-up, collection programs, recycling, and research and development.
4. Mandatory/regulated product stewardship scheme (national)	Mandatory scheme under the Recycling and Waste Reduction Act 2020. Operated by the Australian Government. Industry regulated to participate and comply, and not involved in delivery. Outcomes include a mix of approaches, including education, infrastructure for collection, awareness campaigns, litter pick-up, collection programs, recycling, and research and development.

5. Mandatory/regulated product stewardship scheme (states and territories)	Mandatory scheme delivered by individual states and territories. Industry is regulated to participate and comply and may or may not be involved in delivery. Potential alignment with actions on single-use plastics. Outcomes include a mix of approaches, including education, infrastructure for collection, awareness campaigns, litter pick-up, collection programs, recycling, and research and development.
6. National ban or redesign of plastic filters	Federal Government bans the sale of cigarettes with single-use plastic filters and the sale of single-use plastic filters or supports the redesign of cigarettes so as not to include a plastic filter and otherwise support alternatives to single-use plastic filters (similar to United States of America – California, Senate Bill 424).
7. State and territory ban	Individual states and territories ban the sale of cigarettes with plastic filters and the sale of plastic filters. State and territory governments work with local governments in each jurisdiction to impose a state or territory-wide ban on the sale and use of single-use filters. Potential alignment with actions on single-use plastics.

5.2 Assessment process

The impact assessment involves assessing each potential solution according to how likely it is to impact or be impacted by regulatory, economic, market, consumer and environmental factors. Evidence from existing or similar programs and activities is applied to the questioning, and scores given to enable the solutions to be ranked.

For this study, questions included the following:

Regulatory issues	
Implementation	Ongoing operation
Can the scheme leverage existing regulation? Does the scheme require consultation with a large number of stakeholders (which will take longer)?	Can the scheme use existing structures for administration? Can the scheme use existing collection infrastructure and systems?
Economic issues	
Cost impacts	Financial distribution
Does scheme structure or requirements add cost to government, industry or consumers (directly or indirectly)?	How well does the scheme prevent free riders? That is, are all liable parties paying or are some being subsidised?

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Consumer and market issues	
Consumer participation	Market capture
To what level does the scheme encourage consumer participation?	To what extent does the scheme cover products in the marketplace? What level of accessibility will the scheme achieve?
Environmental outcomes	
Marine and waterway environments	Land environments and human health
To what level does the scheme remove products from causing environmental damage at end-of-life?	To what level does the scheme remove exposure pathways to hazardous materials for land environments/human health?

A scoring guide was developed to enable consistency across each potential solution.

The full impact assessment has been provided to WWF-Australia separately.

5.3 Scoring and ranking

A low score indicates little impact on the assessed factor or outcome, and a high score indicates a potentially significant impact. A zero is applied where the question is not applicable, in this case in the business-as-usual option, as there would be no regulatory activity under such a scenario. Given the focus of this study is to find solutions to the environmental impacts of cigarette filters and butt litter, the potential environmental outcomes are weighted more heavily than other factors. The traffic light colour for the overall ranking indicates whether a solution has been found to have a low, moderate or high likelihood of potentially reducing negative environmental impacts.

Table 4. Scoring and ranking of policy options

Assessment category	Regulatory		Economic		Product capture		Environmental outcomes		Overall ranking
	Implementation	Ongoing operation	Cost impacts	Financial distribution	Consumer participation	Market capture	Marine and waterway environments	Land environments and human health	
Business as usual	0	0	3	1	1	1	1	1	Low
Industry-led, voluntary product stewardship scheme	1	2	2	2	2	1	1	1	Moderate

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Co-regulatory product stewardship scheme (national)	1	2	2	2	2	3	2	2	Moderate
Regulated product stewardship scheme (national)	1	3	3	3	2	2	2	2	High
Regulated product stewardship scheme (states and territories)	1	1	3	2	2	2	2	2	Moderate
National ban	1	2	2	3	3	2	3	3	High
State and territory ban	1	1	2	2	2	2	2	2	Moderate

5.4 Product stewardship solutions – further analysis

The design and roll-out of product stewardship programs will heavily influence the outcomes and overall benefits regarding litter prevention, materials recycling and any potential co-benefits that may be derived.

The table below provides a high-level overview of scheme impacts:

- Reduced littering;
- Reduced use of filters;
- Recycling of filters; and
- Co-benefits.

Table 5. Impact ratings

Impact rating	Reduced littering	Reduced use of filters	Recycling of filters	Co-benefits (such as health)
High	A significant reduction (>50%) in littering behaviour and or amount of plastic litter to the environment	A significant reduction in sales of single-use plastic filters (>90%)	A significant increase in the recovery and recycling of cigarette butts and single-use plastic filters	Expected and tangible co-benefits, including reduced risk to human health and reduced cost to communities
Medium	Moderate reduction (20-50%) in littering behaviour and or amount of plastic litter to the environment	Moderate reduction in the sale of cigarettes with single-use plastic filters	Moderate increase in the recovery and recycling of cigarette butts and single-use plastic filters	Potential for co-benefits to be realised, however potential risk/barriers exist
Low	Little or no expected change in litter behaviour and or the amount of plastic litter to the environment	Little or no expected change in the sale of cigarettes with single-use plastic filters	Little or no change in the recovery and recycling of cigarette butts and single-use plastic filters	Few or no expected co-benefits

Table 6. Summary of analysis of scheme impacts

Industry-led voluntary scheme				
Overview	Impacts			
	Reduced littering	Reduced use of filters	Recycling of filters	Co-benefits (such as health)

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An industry-led voluntary scheme accredited under the Recycling and Waste Reduction Act 2020	Low	Low	Low	Low
Co-regulatory scheme (national)				
Overview	Impacts			
	Reduced littering	Reduced use of filters	Recycling of filters	Co-benefits (such as health)
Industry-led regulated scheme under the Recycling and Waste Reduction Act 2020	High	High	Medium	Medium
Regulated scheme (national)				
Overview	Impacts			
	Reduced littering	Reduced use of filters	Recycling of filters	Co-benefits (such as health)
Mandated, government-run scheme under the Recycling and Waste Reduction Act 2020	High	High	Medium	Medium
Regulated scheme (states and territories)				
Overview	Impacts			
	Reduced littering	Reduced use of filters	Recycling of filters	Co-benefits (such as health)
Regulated scheme under state and territory legislation	Medium	Low	Medium	Medium

6 Findings

Cigarette filters and butts create a range of negative environmental impacts that, despite sustained efforts, prove stubbornly difficult to eradicate.

This report found that a national ban on plastic filters or a national product stewardship scheme, similar to the EU's extended producer responsibility legislation, are the two solutions likely to have the greatest impact in reducing butt litter. A national ban on plastic cigarette filters would be the most effective because it removes the plastic part of the product that has the most significant negative environmental effect.

The product stewardship approach most likely to deliver significant environmental benefits is a nationally mandated scheme led by the Australian Government. Next best is an industry-led, co-regulatory scheme with Australian Government oversight. Such approaches would compel cigarette manufacturers to support, fund or otherwise facilitate more action to reduce litter.

The cost to the Australian economy of tobacco-related waste is reportedly about \$73m annually. As part of a product stewardship scheme, a levy of less than one half of one cent for each of the 17.8 billion cigarettes consumed each year would be sufficient to meet the estimated national litter clean-up costs and scheme operational costs. Other funds may need to be raised to administer, manage and communicate cigarette butt reduction programs.

Such a levy per cigarette or filter is negligible. The average cost per cigarette would be \$1.75 (\$35 for a pack of 20), adding 0.2% to the cost of each cigarette. This would raise the current average cost of a pack of 20 cigarettes from \$35 to \$35.08.

Another alternative would be a direct product stewardship scheme that required brand owners to pay a levy based on market share or products sold each year. Money raised would fund the scheme and associated litter reduction and take-back programs. Such approaches are common to product stewardship schemes in Australia.

A national scheme, with greater reach and economies of scale and therefore greater impact, is preferable to states and territories managing individual schemes. However, some have already enacted laws that could potentially be used to ban plastic cigarette filters. This would go beyond broad-based anti-littering laws and fines, specifically targeting plastic products to reduce their sale and use.

A product stewardship approach is in line with growing international recognition of the negative environmental impacts of butts and the potential of extended producer responsibility solutions. International initiatives commonly aim to get tobacco product manufacturers to take more direct responsibility for the environmental problems their products create – waste butts and littering. In practical terms, product stewardship for cigarette butts means industry supporting, funding or otherwise enabling:

- Enhanced infrastructure to reduce litter;
- Increased litter clean-up;
- Take-back and recycling of butts; and
- Better cigarette butt design to lower environmental risks.

A voluntary product stewardship scheme is highly unlikely to have any significant impact. Evidence for this includes that such an approach through the Butt Free initiative had little impact, that the industry ceased funding Butt Free and other programs and that the current voluntary Tobacco Industry Product Stewardship Group is focused on investigating closed loop solutions.

Unsurprisingly, a business-as-usual approach to addressing cigarette butt litter is unlikely to have a significant impact on the issue. Ramping up existing measures, such as litter enforcement blitzes or enhanced public awareness raising, may result in a modest reduction of butt litter but the problem will remain.

7 Recommendations

In light of these findings, current support for product stewardship solutions and their potential to address the environmental problems associated with cigarette butts, a mandatory national product stewardship scheme is recommended as the most effective and viable solution.

Expertise and experience in managing the butt litter problem resides with the states and territories, so any product stewardship scheme needs to be developed in partnership with them, then implemented at a national level. This could be through the Recycling and Waste Reduction Act or individual state/territory mechanisms.

Environmental powers within the Recycling and Waste Reduction Act to prohibit the sale of single-use plastic filters from cigarettes should also be strongly considered as part of any product stewardship scheme. The government's proposed taskforce to address this issue is the ideal vehicle for further consultation and research with public health and tobacco control experts, to explore the implications and viability of such a ban.

This report provides some direction for the design of a potential product stewardship scheme to address cigarette butt litter in Australia. A scheme would shift costs away from ratepayers and taxpayers and onto the producer and polluter. It could include, but is not limited to:

- Raising a levy of less than one half of one cent (\$0.004 per cigarette) from sales to pay for the scheme;
- Supporting the research and development of improved cigarette butt collection, recovery and reprocessing;
- Supporting the design of better cigarette butt alternatives, which avoid troublesome components and materials;
- Improving the awareness and education of smokers and the general community on the problem of butt litter and disposal solutions; and
- Incentivising smokers to dispose of butts in an environmentally sound manner.

Next steps

The Australian Government should:

1. Place cigarette butts/filters on the product stewardship priority products and projects list for 2021-22.

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2. Establish and activate a government-led, cross-sectoral task force to reduce cigarette butt litter in Australia and consider potential stewardship schemes. The task force should include environmental expertise.
3. Via the task force, engage with the Product Stewardship Centre of Excellence to determine best-practice components of a cigarette butt product stewardship scheme.
4. Examine, with health officials, the viability and impact of removing plastic filters, and investigate the viability of biodegradable filters.
5. Consider options for funding the scheme, including imposing a levy per cigarette, or a levy paid directly by brand owners.
6. Undertake further product stewardship scheme development in partnership or at a minimum, close consultation with the states and territories.
7. Ensure product stewardship work is consistent with and complements broader laws and activities relating to tobacco control.

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