Consultation document

Proposed mandatory phase out of single-use plastic shopping bags

Waste free future

Have your say on plastic bags

Ministry for the Environment
Manatū Mō Te Taiao
New Zealand Government

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Scientists estimate that eight million tonnes of plastic enter the ocean every year, adding to plastics that have been accumulating since the 1950s. If nothing changes, this means there could be more plastic in our oceans (by weight) than fish by the year 2050. There is early evidence of the toxicity of these plastic particles to marine species, and potentially the human food chain.

One of the top five items in coastal litter is single-use plastic bags.

The impact of plastic bags in the sea was graphically illustrated recently by media reports of the discovery of dead whales, as far apart as Spain and Thailand, which had eaten large numbers of plastic bags.

Plastic contamination of the oceans is a complex, global problem which many countries and industries must address. New Zealanders can play their part as responsible global citizens. Our marine Exclusive Economic Zone is 15 times the size of our land mass, making it one of the largest in the world. Not surprisingly, it contains some of the world's most precious marine environments.

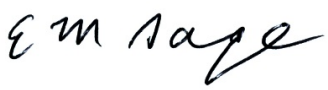
Single-use plastic bags also are often lost to landfill instead of being recycled, or they contribute to litter in our communities, natural areas, and waterways.

The Government's long-term approach to this problem is to help reduce the amount of plastic waste we generate and take a circular economy approach to design waste out of the system. This Government seeks transition to a sustainable, productive and inclusive economy which includes designing out waste, pollution, and greenhouse gas emissions.

We have examined a number of options to help reduce the impacts of single-use plastic shopping bags. This consultation document proposes a mandatory phase out of sale or distribution through regulations under the Waste Minimisation Act 2008 to build on voluntary initiatives by industry leaders.

Government working alongside industry can be very powerful, and this consultation will help determine whether, and how, government should reinforce existing industry initiatives in this area.

Please provide your views on ways to reduce single-use plastic shopping bags entering the environment, and the role that communities and businesses can play.



Eugenie Sage
Associate Minister for the Environment

Executive summary

Plastic is prevalent throughout the economy, including in packaging, consumer goods, construction, and transport. The accumulation of plastic in the environment is a serious concern. Plastic is estimated to make up about 80 to 85 per cent of marine litter and, if trends continue, by 2050 our oceans could contain more plastic than fish, by weight.

Once in the ocean, plastics break down into microplastics (small pieces of plastic less than 5 millimetres in size). There is early evidence of the toxicity of these plastic particles to marine species, and potentially the human food chain. More research is needed to investigate possible long-term risks for humans and ecosystems.

One documented source of marine plastics, plastic microbeads, was prohibited in certain products in New Zealand from June 2018.

Like other plastics, single-use plastic shopping bags are persistent, mostly non-biodegradable, accumulate over time in the natural environment, and travel easily to our coasts and oceans through stormwater pipes, rivers, and by wind.

⏩ Single-use plastic shopping bags are a small subset of all the sources of marine plastics. These bags have been chosen as a starting point to engage the community as they touch every consumer and many practical and affordable alternatives exist. ⏪

Kau Bay, Wellington Photo credit: Rob Wilson

Single-use plastic shopping bags are an everyday item that can be replaced by accessible alternatives. Addressing their use means addressing the wider issues of harm from plastic waste, particularly marine debris, and taking a circular economy approach to design waste out of the system.

The options available include:

- non-regulatory approaches (a formal agreement with industry or the *status quo*)
- those requiring new legislation or regulation (mandatory phase out, levy, charge, tax, or deposit-refund)
- intermediate models (product stewardship).

The main goals are to begin phasing out single-use plastic shopping bags, taking a circular economy approach to designing waste out of the system, while avoiding undue costs on the community, business, or public funds. It would also be desirable to minimise new legislation, encourage reuse or recycling, and generate funds to benefit communities or the environment.

On the above basis the highest ranked option is a mandatory phase out of sale or distribution of single-use plastic shopping bags, which includes giving them away at no cost. The other options were ranked lower in the following order: a point of sale charge (levy or mandated

charge); a formal agreement; deposit refund; product stewardship; and a pre-consumer tax. This assessment was based on information from overseas experience, which has many gaps in relation to these goals.

We are now consulting on whether a mandatory phase out of sale or distribution of specified plastic shopping bags is the best option for New Zealand. It is proposed that at least six months after regulations are Gazetted, the sale or distribution of specified single-use plastic bags would be prohibited.

1 Introduction

About this consultation

The Government is considering phasing out single-use plastic shopping bags in New Zealand as one of many steps to reduce the negative environmental impacts of plastic. At the same time, the Government will work toward a longer-term goal of using a circular economy approach to design waste out of the system in New Zealand, ensuring plastics and other resources are cycled back into the economy.

Currently no government policies or regulations are specifically aimed at reducing the impacts of single-use plastic shopping bags. The Government is considering how to manage the environmental, economic, social, and cultural impacts of these bags and is seeking feedback on the proposed option of a mandatory phase out of their sale or distribution.

The term 'single-use plastic shopping bag', as it is used in this consultation document, means a new plastic bag (including one made of degradable plastic) which has handles and is below a particular level of thickness. The terms 'plastic' and degradable' (including biodegradable, compostable or oxo-degradable) would be defined in regulations with reference to international standards. The proposed phase out would apply to these bags when they are sold or distributed for the purpose of carrying sold goods.

After considering six options for reducing the impacts of single-use plastic shopping bags we are consulting on a mandatory phase out of sale or distribution of single-use plastic shopping bags in New Zealand.

We welcome your views.

We are also seeking more information from New Zealand businesses and consumers to better understand the costs and benefits of this proposal.

This consultation is intended to:

- gauge public support, including iwi/Māori views, on a mandatory phase out of single-use plastic shopping bags
- test the scope of a mandatory phase out of single-use plastic shopping bags, including the definition of the types of products to be affected
- identify activities that involve the use of single-use plastic shopping bags that may require an exemption to the proposed regulation
- identify manufacturers and importers of single-use plastic shopping bags
- identify retailers that should be exempt from the proposed mandatory phase out of single-use plastic shopping bags.

For information on how to make a submission, including questions to guide your feedback, see section 6.

Submissions close at 5.00 pm on Friday 14 September 2018.

2 Environmental and social impacts

The problem with plastic and marine litter

Plastics are widespread throughout the economy – for example, in packaging, consumer goods, construction, and transport. Most plastics are durable and long lasting. Once thrown away or lost, they enter the environment and a proportion eventually enter the sea. The build-up of plastic waste in marine environments is a global issue.

What we do on land directly impacts the amount of plastic in the ocean. Plastic bags, plastic bottles, and other plastic waste travel easily to our coasts and oceans through stormwater pipes, rivers, and wind. Synthetics worn from paints and roadways, small fibres from washing synthetic fabrics, spills from manufacturing plants, and marine dumping are other sources of marine plastic debris.

Plastics make up an estimated 80 to 85 per cent of marine litter. Once in the environment, they eventually break down into microplastics (small pieces of plastic less than 5 millimetres in size). The risk of microplastics and the toxins they bring entering the food chain is a growing concern. Toxins may be original additives in the plastic (eg, plasticisers and dyes) or chemicals absorbed and carried by them later (eg, persistent organic pollutants).

Early evidence indicates plastic particles can be toxic in biological systems from marine invertebrates to mammals. More research is needed on likely long-term risks for human, animal, and plant life (eg, Auta et al, 2017; Gall and Thompson, 2015; Ministry for the Environment, 2017a; Tanaka et al, 2013).

Evidence suggests the impacts of plastic litter and resulting microplastics on New Zealand's fresh water are similar to the marine environment. Overseas research has shown that microplastics in lake and river sediments, and any plastics not captured in wastewater treatment, flow through fresh water on their way to the ocean (Ministry for the Environment, 2017a).

Microplastics in marine and freshwater environments are likely to be present in both the water column and sediment. Aquatic organisms can mistake the particles for food and swallow them, or shellfish can take them in passively during filter feeding. The negative impacts of this include internal damage and starvation.

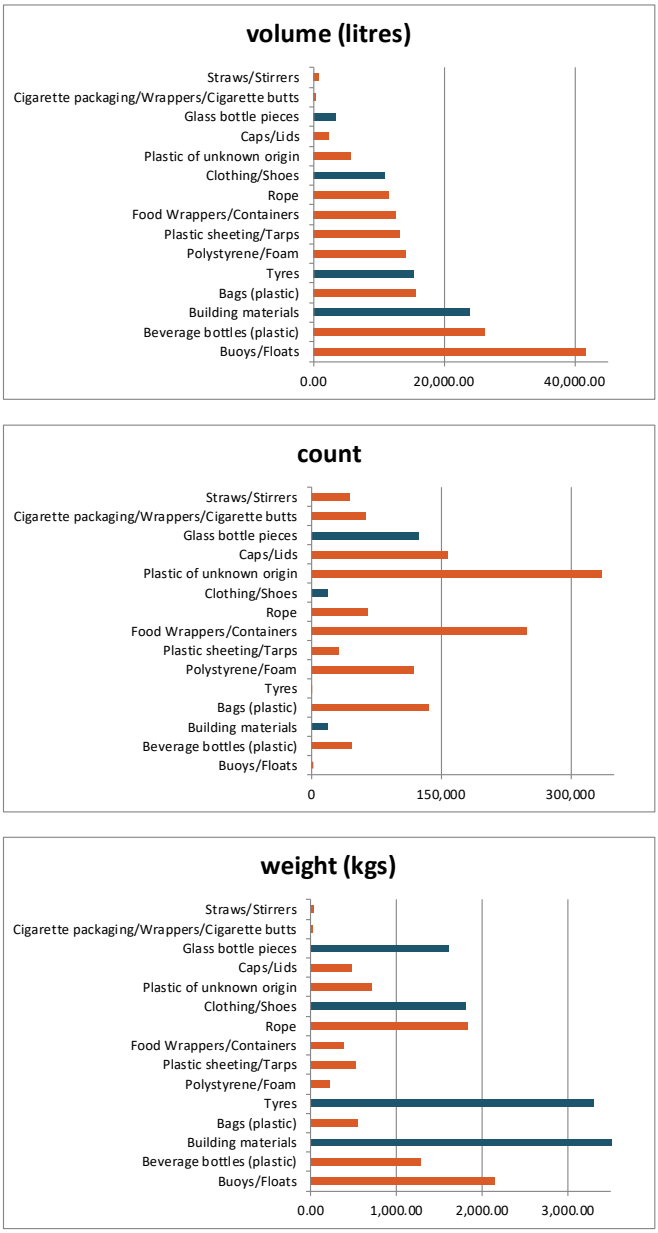
A recent study found some young fish prefer tiny particles of plastic to natural food sources. This means they starve before they can reproduce (Ministry for the Environment, 2017a). A survey of exposed beach, harbour, and estuary environments in New Zealand found microplastics in 8 of 10 samples. The majority were polystyrene (55%), polyethylene (21%), and polypropylene (11%) (Clunies-Ross et al, 2016). Single-use plastic shopping bags are usually polyethylene.

An estimated eight million tonnes of plastic waste enter the global marine environment each year. If the trend of plastic production increasing continues, and while our current disposal patterns remain the same, predictions are that by 2050 the plastics in the ocean could outweigh the fish (Ocean Conservancy and McKinsey Centre for Business and Environment,

2015). Marine plastics come from many countries around the world, but the majority is thought to come from 10 large rivers with population-rich catchments (Schmidt et al, 2017).[1]

New Zealand coastal clean-up data (summarised in figure 1) shows that a wide range of litter types is common, with the most common types depending on whether the data is measured by count, volume, or weight. However, categories entirely or mostly of plastic are common across all measurement methods). The most common plastic litter by count is, in order: 'plastic of unknown origin', followed by food wrappers and containers, caps and lids, and plastic bags.

Figure 1: Coastal clean-up data, New Zealand, top litter categories by volume, count, and weight



Data source: Sustainable Coastlines, pers. comm., 2017

Note: Categories made entirely or mostly of plastic are highlighted in orange; others are in blue. Data are from 69 coastal clean-up events throughout New Zealand, December 2010 to April 2016. Litter categories for all three graphs have been ordered by highest prevalence by volume so it is easier to compare them.

[1] The Yangtze, Hai, Yellow, Pearl and Amur Rivers in China, the Indus and Meghna Rivers in the Indian subcontinent, and the Nile, Niger and Mekong Rivers. This estimate is based on a small number of studies.

Plastic bag impacts

Single-use plastic shopping bags are often given free to consumers, encouraging excessive use. Industry estimates of current consumption in New Zealand of standard supermarket single-use shopping bags are 154 bags per person per year. This is about 750 million bags per year, or about 0.01 per cent by weight of total waste in levied landfills (appendix 1). Single-use plastic shopping bags are convenient but can cause unnecessary waste and litter when alternatives are readily available.

Single-use plastic shopping bags are one of many types of plastic bag entering the environment and a small subset of all sources of marine plastics. Putting in place measures to phase out single-use plastic bags is a first step to addressing the 'throwaway culture' of a linear economy. The choice of these bags as a starting point for engaging the community is appropriate because they touch every consumer, and many practical and affordable alternatives exist.

Currently, discarded plastic bags in New Zealand may go to municipal landfills, voluntary recycling schemes, or end up in the environment. There is no facility in New Zealand for recycling soft plastics, and finding overseas markets is problematical. A proportion of plastic bags in rubbish or recycling bins will escape and become windblown litter. Landfill operators typically place wire mesh barriers around landfills to catch windblown bags, which reduces but does not eliminate litter from that source (figure 2). Because they are so light, single-use plastic bags can become highly mobile in wind and water, highly visible, and widely distributed in the environment.

Figure 2: Plastic bags in a gully near the Wellington landfill

Photo credit: Kevin Stent / Fairfax

Published urban litter count data does not differentiate plastic shopping bags from 'unclassified packaging', which makes up 10.8 per cent by count in 'visible litter'. Takeaway food and drink packaging makes up an estimated 40.2 per cent, and non-packaging litter[2] makes up 42.4 per cent (Waste Not Consulting, 2015). Councils, and therefore ratepayers, typically bear the cost of cleaning up litter from public areas.

Because used plastic bags have a low market value, most kerbside recycling collection schemes do not offer plastic bag recycling. The voluntary Soft Plastics Recycling scheme run by the Packaging Forum currently collects less than two per cent of post-consumer plastic bags (section 4).

[2] For example tissues, newspapers, household items, and commercial items.

Even when plastics are buried in landfill, they may still eventually enter the marine environment. High seas and flood waters can uncover old landfills and release plastics and other contaminants into waterways (figure 3).[3] Plastic bags may entangle marine life and aquatic organisms may mistake them for food before they break down (see 'Life-cycle impacts' below).

Figure 3: Plastic waste eroded onto beach from old landfill near Greymouth, February 2018

Photo credit: Tony Kokshoorn

Life-cycle impacts

All types of shopping bags need resources to create them, and have potentially negative environmental impacts when they are produced and disposed of. How they are used, reused and recycled will influence their relative environmental impacts over the whole life cycle.

Published life-cycle analyses of bags do not consider a number of environmental impacts, including litter impacts on land and impacts of plastic on marine ecosystems. Reducing whole-of-life environmental impacts, as reported in published life-cycle analyses, is possible by producing multiple-use bags and using them a sufficient number of times to bring down their impact per use. For further information on the impacts of different bags see appendix 2.

Degradable, biodegradable and compostable plastic bags

Some single-use plastic shopping bags are marketed as 'degradable', 'oxo-degradable', 'biodegradable' or 'compostable'.[4] Some of these are claimed to meet specified standards or independently verified certifications. These may be seen as having fewer impacts than ordinary single-use plastic shopping bags but at present this is not the case.

'Degradable' plastics include types that degrade through physical forces as well as those that can be degraded by natural organisms. Biodegradable, compostable and oxo-degradable plastics are types of degradable plastics.

Shopping bags made wholly of natural fibres, such as paper, jute or cotton, will fully break down in natural environments. However, current evidence suggests that 'compostable' or 'biodegradable' plastics made wholly or partly from natural sources or compounds will

[3] www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11986704.

[4] In addition, some plastics marketed as 'biodegradable' are actually 'degradable' or 'oxo-degradable' (Loughborough University, 2010).

require specific artificial environments, such as high-temperature controlled composting, to completely break down. Natural environments, including the digestive system of animals, generally do not have conditions necessary to fully break down plastic bag products currently certified as 'biodegradable' or 'compostable' (Parliamentary Commissioner for the Environment, 2018; Department for Environment, Food and Rural Affairs, 2015; Emadian et al, 2017). For example, starch-based plastic bags are fully degraded through the action of soil bacteria and fungi at temperatures that are not common in natural aquatic environments (Accinelli et al, 2012).

One type of degradable plastic used in single-use plastic shopping bags is 'oxo-degradable'. These plastics are designed to break down into smaller pieces when exposed to heat or light, but are not biodegradable by living organisms. These plastics readily break down into microplastics and also present the risk of degraded strength if they are included in recycled plastics (Loughborough University, 2010).

New Zealand does not yet have an effective way of diverting post-consumer 'biodegradable' or 'compostable' plastic bags to high-temperature composting, except where used to line collection bins for food waste taken to commercial composting. The Soft Plastics Recycling system does not separate biodegradable/compostable plastics from mainstream plastics, or send biodegradable/compostable plastics to high-temperature composting. Large retailers could in theory set up targeted collection systems.

Degradable, plastic bags can contaminate non-degradable plastic recycling systems reducing the value of recycled products and the value of commercial compost through contamination. In landfills biodegrading plastic bags are likely to produce methane, which will contribute to climate change if the landfill does not have an effective methane capture system. Degradable plastic bags may also still entangle marine life or aquatic organisms may mistake them for food before they break down.

In the short to medium term, we propose that single-use plastic shopping bags, including those made of degradable plastic (including biodegradable, compostable and oxo-degradable plastic) be phased out. Taking a 'circular economy' approach to redesign plastics should lead to much better options in the long term and the regulatory framework could be adjusted accordingly.

Taking a 'circular economy' approach to design waste out of the system

Only an estimated 10 per cent of plastics globally are cycled back into the economy in some form; conversely 90 per cent are ultimately disposed of to land, air, or sea. In addition, 95 per cent of the material value of plastic packaging, or US$80–120 billion a year, is lost to the global economy after its short first use. The costs amount to at least US$40 billion a year, which is more than the plastic packaging industry's global profit pool (World Economic Forum, 2016).

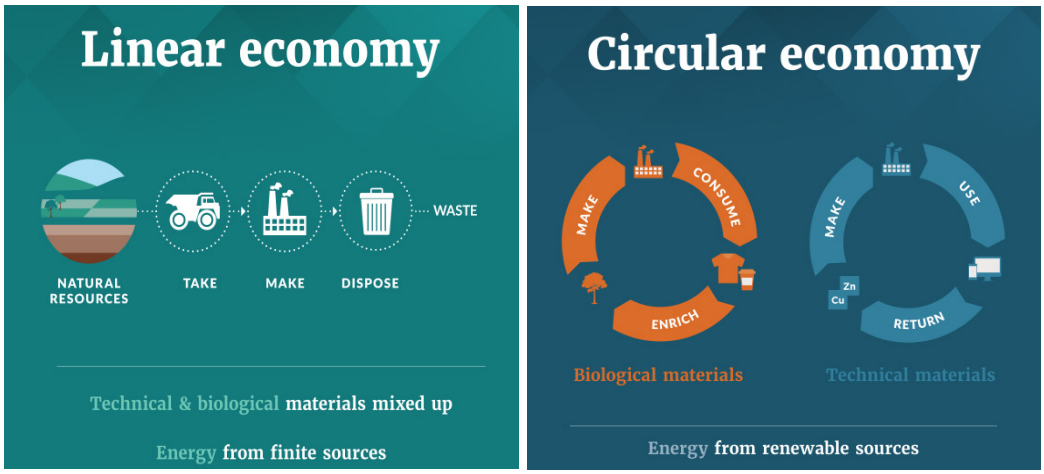
Our current global and New Zealand economic systems are largely 'linear' economies (take–make–dispose – see figure 4). Symptoms of market failure for this linear system include: pollution to air, water, and land; climate change; release of persistent toxic materials; unsustainable rates of harvest for food and materials; and loss of species and ecosystems.

The capacity of Earth is finite, while the human population and our aspirations for material consumption keep growing. As a result, global consumption of raw materials and natural ecosystem services is increasing rapidly in a degrading environment. Current evidence

indicates that we have already stepped over a number of safe planetary boundaries (Steffen et al, 2015).

Countries around the world, including many of New Zealand's trading partners, are challenging the linear economic model. The 'circular economy' (figure 4) provides an alternative model for creating prosperity. It values resources for their intrinsic worth, respects and restores the natural cycles for biological materials (make–consume–enrich), and creates nature-inspired cycles for human-made materials (make–use–return).

Figure 4: Comparing 'linear' and 'circular' economies



A circular economy is restorative and regenerative by design. It aims to keep products, components and materials at their highest utility and value (Ellen Macarthur Foundation, 2013). By redesigning materials, products, services, cycling systems, energy sources, business models, inter-sectoral linkages, and value chains, it becomes possible to create both sustainability and added economic value.

Entities such as the Ellen Macarthur Foundation, the World Economic Forum, and the United Nations Environment Programme have developed global initiatives to drive better design and systems to transition to a circular economy. Among these initiatives is the New Plastics Economy project, which seeks to create a shared sense of direction and increase innovation. It aims to move the plastics value chain towards capture of value at many more stages, stronger economics, and better environmental outcomes (Ellen Macarthur Foundation, 2017; World Economic Forum, 2016).

The Government intends to participate in these initiatives and take a circular economy approach to design waste out of the system. New Zealand has also recently formally joined the United Nations Environment Programme's Clean Seas Campaign and the Commonwealth Clean Ocean Alliance, which both include the reduction of single-use plastics as core objectives.

Single-use plastic shopping bags, like many other consumer and service delivery products, are designed to be used once and thrown away – a linear economy approach. Already alternatives to single-use plastic shopping bags are available, offering a more circular design that encourages multiple reuse. Improving recycling systems for these bags at the end of their life is also necessary to improve the circularity of their design.

Actions to phase out aspects of a linear 'throwaway culture' are part of a transition to a circular economy. Single-use plastic bags have been chosen as a useful starting point for engaging the community as they touch every consumer, and practical and affordable alternatives exist.

3 Overseas experience

To design an appropriate phase-out option for single-use plastic shopping bags in New Zealand, it is useful to look at the overseas experience.

Policy objectives in these jurisdictions have included: reducing litter and increasing the aesthetic appeal of public and natural spaces; protecting marine species and ecosystems; using resources efficiently; and addressing public health concerns about blocked drains and flooding. Quantitative information on net costs and benefits for various methods tried overseas is instructive, but not comprehensive. We welcome information to help refine this analysis for New Zealand.

This section summarises the most common methods used overseas, and information from overseas about other methods available in New Zealand under the Waste Minimisation Act 2008 (WMA).

Bans

Bans work by regulating to remove an option from the marketplace. Over 103 overseas jurisdictions have implemented bans on various types of plastic bags.[5] These include:

- bans on distribution by:
  - prohibiting retailers from providing bags (eg, South Australia, Tasmania, Northern Territory, Australian Capital Territory, Queensland, Western Australia, Belgium, France, Italy, Bangladesh, Rwanda, Haiti, Mexico City, City of Austin, State of Sikkim)
  - prohibiting retailers from providing bags and requiring them to charge for permitted bag types (eg, China, Israel, California)
- banned entry into the market and use focused on:
  - manufacture, importation and use (eg, Mauritania, Somalia, Kenya, Morocco)
  - manufacture and use (eg, India).

Increased cost (levy, tax, mandatory minimum charge)

Increased cost methods work by putting a cost on a good that was previously ‘free’ to the consumer. More than 41 overseas jurisdictions have implemented levies, taxes, or charges on various types of plastic bags.[6] Methods include:

- requiring retailers to add a levy or charge at point of use, which is then:
  - remitted to a central government fund for environmental purposes (eg, Ireland), or
  - retained by the retailer, with an expectation that the retailer will donate it to good causes, with public reporting (eg, United Kingdom), or

[5] UNEP (2018).

[6] Ibid.

  - retained by the retailer (eg, Hong Kong, China, Taiwan, Netherlands, Wales, Scotland, Indonesia, South Africa)
- taxing plastic bags at manufacture or import (before they reach the consumer) (eg, Denmark, Italy).

Formal agreements with industry

In Norway, Finland, Austria, and Hungary, the federal Governments have reached formal agreements with industry, requiring retailers to charge their customers for plastic shopping bags. In Germany the agreement is to phase out specific types of bag.

In Australia from 2003 to 2005, government and industry promoted a Voluntary Code of Practice for the Management of Plastic Bags. Participants included the major supermarkets, and a survey by the Australian Retailers Association in 2005 found that 19 per cent of responding retailers had joined the code (Australian Retailers Association, 2005). Over the three years of the initiative, single-use plastic shopping bag use fell by an estimated 44 per cent. After use increased again from 2007, individual Australian states began to enact their own controls from 2009 (Department of Environment and Heritage Protection, 2016).[7]

The 2006 UK Supermarket Voluntary Carrier Bag Agreement reduced single-use plastic shopping bag consumption by an estimated 33 per cent over 2006–2011 (Miller, 2012, table 20). A compulsory minimum charge at the point of sale was progressively established in the UK member countries from 2011 through 2015.[8]

Deposit-refund systems

A regulated deposit-refund system puts a new cost onto a product, which is refunded to the consumer when they bring back the material for recycling. The deposit-refund method has been used overseas most commonly for beverage containers, to provide an incentive for people to return packaging that might otherwise end up in the litter stream. While the same thinking could apply to single-use plastic shopping bags, we have found no overseas examples of using deposit-refund systems for these bags.

Mandatory product stewardship

Mandatory product stewardship, or 'extended producer responsibility', is where producers that put certain goods on the market are required to be responsible for environmentally sound end-of-life management of the product. Typically the price to do this is charged on the product at the point of sale. Products most commonly covered by such schemes overseas include packaging, electronic and electrical waste, batteries, tyres, vehicles, and oil.

We have found no examples of product stewardship schemes in other jurisdictions for plastic bags alone. Plastic bags are, however, included in many mandatory 'extended producer responsibility' schemes overseas for packaging as a whole (eg, countries in the European Union). These countries generally have lower plastic bag use rates (appendix 1).

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[7] State bans in place: South Australia 2009, Northern Territory 2010, Australian Capital Territory 2011, Tasmania 2012, and Queensland 2018.

[8] Wales 2011, Northern Ireland 2013, Scotland 2014, and England 2015.

Table 1: Overseas examples of the effectiveness of different methods in phasing out single-use plastic shopping bags

Jurisdiction	Phase-out method	Use rates	Public opinion	Litter and waste to landfill
Australia[1]	Voluntary code of practice – industry and government agreement (2003–2004)	44 per cent reduction, followed by increase from 2009 then individual state bans from 2009		
South Australia[2]	Ban (2009) Under 35 microns	76 per cent of shoppers take own bags instead of purchasing new multi-use bags, or buy few items and do not require a bag	Majority support ban (4 per cent "not at all supportive"); 82 per cent believe ban having an impact 78 per cent of shoppers support the ban and 56 per cent support extension to heavier bags Over 50 per cent of retailers 'had no problems' with implementation	Litter: 45 per cent reduction (by count). Heavier bags more common in litter stream than in other states without bans Waste: Increase in proportion of consumers buying bin liners (15 to 80 per cent). Reasons for disposal of reusable bags (for the 50 per cent of consumers who did so in the past six months): the bags were worn out (60 per cent), dirty (34 per cent), or 'had too many' (15 per cent)
Northern Territory[3]	Ban (2010) Under 35 microns	100 per cent decrease in targeted bags and 74 per cent decrease in all bag sales (including bin liners)	Average of 73 per cent support for the ban, up from a pre-ban level of 64 per cent 48 per cent claimed to be not at all inconvenienced by the ban, and 3 per cent claimed to be extremely inconvenienced	Litter: 41 per cent reduction in targeted bags, and no change in heavier weight shopping bags
Australian Capital Territory[4]	Ban (2011) Under 35 microns	84.6 per cent reduction. Bin liner sales returned to pre-ban levels	65 per cent support (three years after ban, up from 58 per cent a year after the ban)	Litter: Plastic shopping bags in stormwater gross pollutant traps from 'common' to 'rare' Waste: 36 per cent reduction (all shopping bag types, single and multiple use)
Ireland[5]	Levy, proceeds to government (special fund)	90 per cent reduction		Litter: 95 per cent decrease in litter (plastic bags in litter before levy 5 per cent, after 0.25 per cent)
United Kingdom[6]	Supermarket Voluntary Carrier Bag Agreement (2006–2011)	33 per cent reduction *Compulsory charges at point of sale followed in UK jurisdictions from 2011*		

Jurisdiction	Phase-out method	Use rates	Public opinion	Litter and waste to landfill
Wales[7]	Mandated minimum charge (2011)	71 per cent reduction (2011–2014)	74 per cent support (2015 – four years after controls, up from 61 per cent in 2011 when introduced)	
England[8]	Mandated minimum charge (2015) Under 70 microns	83 per cent reduction (seven main retailers only)		
Hong Kong[9]	Levy, proceeds to Government (2009 – large retailers only) Mandated minimum charge (2015 – all retailers)	75 per cent reduction (targeted retailers only)		Waste: With Levy on large retailers only: 6 per cent increase in targeted bags to landfill With mandated charge on all retailers: 25 per cent decrease targeted bags to landfill
China[10]	Ban non-biodegradable plastic bags less than 25 microns, levy on consumer for thicker bags	Use rate in supermarkets decreased 60 to 80 per cent. Not well enforced in food markets or with small retailers		
Belgium[10]	Levy (2007)	Consumption of bags decreased 80 per cent over 10 years		
Israel[11]	Ban on bags less than 20 microns and levy on thicker bags (2017)	80 per cent reduction		Litter: 50 per cent reduction in plastic shopping bags found in the sea
Austin, Texas[12]	Ban	75 per cent decrease		Waste: No change in weight of all types of shopping bags in waste (single and multi-use)
Morocco[10]	Ban on production, importation, sale and distribution Black plastic bags (2009); then all plastic shopping bags (2016)	Plastic bags “virtually no longer used in the country”. Citizens have switched to fabric bags.		

Jurisdiction	Phase-out method	Use rates	Public opinion	Litter and waste to landfill
Sikkim, India[10]	Ban – delivery or purchasing of goods in plastic wrappers or bags (1998)	66 per cent of shops using paper bags or newspaper		

1 Department of Environment and Heritage Protection (2016).

2 Ehrenberg-Bas Institute for Marketing (2009).

3 Rawtec (2014). In addition, 76 per cent of retailers still offer at least one type of shopping bag for free to their customers, but not the banned type. Before the ban, shoppers claimed on average to bring their own bags with them to the store 1.7 times out of 10, and after the ban 5.5 times out of 10. This aligned with observed behaviour, 46 per cent of shoppers bringing at least one bag with them from home to the store and 38 per cent receiving at least one bag from the store.

4 Environment and Sustainable Development Directorate (2014).

5 Convery et al (2007) and BIO Intelligence Service (2011, annex B).

6 Miller (2012).

7 https://gov.wales/topics/environmentcountryside/epq/waste_recycling/substance/carrierbags/?lang=en, accessed 21 May 2018.

8 Department for Environment, Food and Rural Affairs (2017); calendar year 2014 compared with fiscal year 2016–17. Reported donations to charitable community projects from the mandated minimum charge by 168 reporting retailers was £66.4 million in 2016-17.

9 https://www.epd.gov.hk/epd/english/environmentinhk/waste/pro_responsibility/env_levy.html, accessed 20 May 2018; Environmental Protection Department (2011, 2013, 2016). Levy for major retailers only, charge for all retailers; rate HK 50 cents (NZ 9 cents). The first phase-out method covered 3300 retailers; second method in 2015 covered all 60,000 retailers.

10 UNEP (2018), pp 27-42.

11 https://www.unenvironment.org/news-and-stories/story/just-one-year-israel-halves-plastic-bags-found-sea.

12 Waters (2015). Note Austin is surrounded by communities (and shops) not covered by the city ban. The landfill data compared Austin catchment waste with waste from neighbouring communities without a ban. Total weight was the same, but the proportions were different (Austin had 75 per cent less single-use plastic shopping bags).

4 Options for New Zealand

Current context

Public concern

Plastic waste as a whole, and plastic bags in particular, have captured the attention of the media and the public in New Zealand over recent years.

- The Colmar Brunton Better Futures 2017 report found that the build-up of plastic in the environment was among the top 10 concerns of New Zealanders in a list of 38 prompted concerns (Colmar Brunton, 2017).
- Petitions to Parliament calling for controls on single-use plastic bags have attracted over 103,000 signatures in recent years.[9]
- In 2015, 89 per cent of Local Government New Zealand members supported a remit calling for a plastic bag levy. In 2017, 97 per cent of mayors (65 of 67) supported the same remit in an open letter.
- In 2017, the proposal to prohibit plastic microbeads in certain products received 16,223 public submissions, with 99.8 per cent in support (Ministry for the Environment, 2017c).

Retailer responses

Major retailers began to formalise their response to public concern about plastic bags over 2004–2009, while the second voluntary Packaging Accord was operating. Under this accord the Brand Owners and Retailers Sector Action Plan set a target to establish company targets for reducing plastic shopping bags by a minimum of 20 per cent by 2008, on a 2003 and 2004 baseline.[10] Over 2004–2007, three participating major retailers reported achieving a 9.5 per cent reduction (Packaging Council of New Zealand, 2007).

In 2017–18, some major retailers announced a commitment to phase out plastic shopping bags: Countdown, New World, and The Warehouse Group by the end of 2018, and Z Energy and Mitre 10 by the middle of 2018.[11] The Warehouse announced it will replace plastic with 'compostable' shopping bags, for which consumers must pay a charge. Retailers that previously put in place alternatives to free plastic bags include organics shops, Pak n Save, The Warehouse, and Bunnings. Given this momentum, a number of consumers are already preparing for single-use plastic shopping bags not being available in these shops.

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9 Petition 2017/5 of Elena Di Palma on behalf of Greenpeace New Zealand – Ban single-use plastic bags (65,388 signatures); Petition 2014/0135 of Ann Ruxton and 3596 others (3,596+1); Petition 2014/0138 of Grant Robertson (17,877); Petition 2014/0022 of Rebecca Bird on behalf of Our Seas Our Future (16,266); Petition 2011/48 of Kate Hoyle and 20 others (20+1); total signatures = 103,149.

10 Table 5.1, Brand Owners and Retailers Sector Action Plan (2015 final, unpublished) Packaging Council of New Zealand. This action plan was endorsed by over 60 commercial entities from the fast moving consumer goods sector.

11 https://www.countdown.co.nz/community-environment/our-commitment-to-phasing-out-single-use-plastic-carrier-bags; http://www.newworld.co.nz/about-us/news/whats-next-for-bags/; https://z.co.nz/about-z/what-matters/sustainability/saying-goodbye-to-plastic-bags/; https://www.mitre10.co.nz/news/mitre-10-to-ditch-plastic-bags; https://www.thewarehousegroup.co.nz/news-updates/warehouse-group-ditches-single-use-plastic-bags-checkouts. The Warehouse Group includes The Warehouse, Warehouse Stationery, Noel Leeming, and Torpedo 7.

The Packaging Forum's Soft Plastics Recycling project targets a full range of post-consumer soft plastics in New Zealand, including single-use plastic shopping bags. In 2015, the scheme received $700,000 from the Ministry for the Environment's Waste Minimisation Fund to expand collection bins to many retail areas. Now an estimated 70 per cent of the population live within 20 kilometres of a collection bin.

During its establishment phase, the scheme was collecting about 1.7 per cent of the estimated total 6000 tonnes of plastic bags generated per year from fast-moving consumer goods (including not just single-use plastic shopping bags but also other plastic packaging and bags). Its target is to achieve a 10 per cent recycling rate this year and a 35 per cent recycling rate by 2024. Some of these soft plastics are being recycled in Australia but most are being stored while the scheme is exploring local recycling options.

Figure 5: Soft Plastics Recycling collection bin
Photo credit: The Packaging Forum

Availability of alternatives

Single-use plastic shopping bags are useful for carrying purchases away from the shop because they are resilient to relatively heavy loads and moisture.

A wide range of alternatives is now available, often at points of purchase. Options include multiple-use bags in heavier-duty plastic (polyethylene, polypropylene or nylon), composite bags of hessian with other materials, and bags made of cotton, recycled fabric, or jute. Some retailers also provide boxes for re-use. Paper shopping bags are available in some shops, but they are not resilient if they get wet. Shoppers can also bring their own bags, such as lightweight folding nylon bags, wheeled trolley bags, backpacks, and home-made bags. The price for these alternatives is generally in keeping with how long the bags are likely to last, but it is more than free single-use shopping bags, where they are available.

Retailers will profit from not having to provide free bags and by selling alternative carriers, and are in a good position to help their customers to transition.

Consumers on lower incomes who may not feel able to afford longer-life bags may need assistance during any transition. We will engage with retailers on practical options. An example could be for holders of Community Service Cards and Gold Cards to receive assistance or concessions.

Local manufacture

Single-use plastic shopping bags under 35 microns are imported, so phasing them out is unlikely to have a local business or employment impact related to plastic bag manufacturing. Degradable plastic bags are also made overseas. Some paper and heavier-weight bags (plastic bags between 35 and 70 microns) are manufactured here, so there could be an effect on companies depending on their product range and the bag thickness chosen for a phase out.

Multiple-use bags that require some manual construction (eg, polypropylene, jute, cotton) are primarily produced overseas. A number of volunteer community recycled fabric sewing projects in New Zealand encourage local people to create bags from recycled fabric to use and share for reuse.

International trade obligations

The approaches under consideration will be developed to be consistent with New Zealand's international legal obligations.[12]

Objectives

The primary objective of a selected phase-out measure would be to provide a sure way of reducing the impacts of single-use plastic shopping bags in contributing to litter in New Zealand's terrestrial and marine environments, and reducing the risks to marine ecosystems and human health. We recognise that single-use plastic shopping bags are only one of many contributors to these impacts and risks, and other measures are needed.

In achieving this objective, minimising the costs for New Zealand businesses, consumers, and government is also desirable.

We do not yet know the full nature or extent of the impacts of single-use plastic shopping bags specifically, and marine microplastics generally. The Government's proposal takes a precautionary approach to reduce the risk of them contributing to long-term impacts on the environment and human health, as well as their wider socio-economic and cultural impacts.

We have used the following proposed criteria to compare options to reduce the impacts of single-use plastic shopping bags. Each option has been assessed as to whether it can:

- substantially advance the phase out of a single-use plastic product that contributes to litter and the risks associated with marine plastics while over the longer term take a circular economy approach to design waste out of the system *(primary purpose of intervention: triple weighting)*
- be implemented without placing undue costs on the community, business, or public funds *(key regulatory principle: double weighting)*
- be progressed under existing legislation
- provide a financial incentive to return used shopping bags for reuse or recycling
- transfer funds for community or environmental benefit.

Potential phase-out options

A range of options is available to phase out single-use plastic shopping bags. Some are well tested overseas, while others are unique options available under the Waste Minimisation Act (WMA) or proposed locally in recent years. These are described in the section 3 and appendix 3.

The purpose of the WMA is to encourage waste minimisation and a decrease in waste disposal to protect the environment from harm and obtain environmental, economic, social, and cultural benefits. The WMA introduced new tools including a waste disposal levy to fund waste

[12] Before recommending making regulations under the Waste Minimisation Act 2008, the Minister for the Environment must be satisfied that those regulations are consistent with New Zealand's international obligations (section 23(3)(b)(iii) of the Waste Minimisation Act 2008).

minimisation initiatives at local and central government levels, and regulatory powers for products and product stewardship for specified 'priority products'.

Table 2 summarises the options, the mechanisms that we might use to implement them in New Zealand, and whether they have proved effective overseas.

Table 2: Summary of potential options to reduce the impacts of single-use plastic shopping bags and overseas evidence of results

Option	How	Effective overseas?
1. **Mandatory phase out of sale or distribution**	Regulations under WMA (s 23(1)(b))	Yes
2. **Levy, tax or minimum charge** 2A – Levy at point of sale, collected by central government	New legislation: amend the WMA	Yes
2B – Mandated minimum charge at point of sale, retained by retailers	New legislation: amend the WMA	Yes
2C – Levy or minimum charge at point of sale, set by local authorities	New legislation: amend the WMA or other	Yes
2D – Tax at point of entry into market (pre-consumer)	New legislation: amend the WMA or other	Unknown
3. **Deposit-refund system**	Regulations under WMA (s 23(1)(e))	Unknown
4. **Formal agreement** between industry and government	Non-regulatory	Partially
5. **Mandatory product stewardship**	*Gazette* notice under WMA (ss 9 and 12), and regulations under WMA	Unknown
6. **Ad hoc voluntary action** (*status quo*)	Non-regulatory	No

Note: s = section; ss = sections; WMA = Waste Minimisation Act 2008.

Each of these options has been described and ranked against the above criteria in appendix 3. The following results (in order from highest to lowest score) were obtained.

1 Option 1 – Mandatory phase out of sale or distribution

2= Option 2A – Levy at point of sale, proceeds to central government
2= Option 2B – Mandatory minimum charge, retained by retailer
2= Option 2C – Levy or minimum charge at point of sale, set by local authorities

3 Option 4 – Formal agreement between industry and government

4= Option 6 – Ad hoc voluntary action (*status quo*)
4= Option 3 – Deposit-return system

5 Option 5 – Mandatory product stewardship

6 Option 2D – Tax at entry into market (before bags go to the consumer)

This assessment is based on information from overseas experience, which has gaps in relation to the assessment criteria. We welcome information to help refine this analysis for New Zealand.

We are now consulting on whether to proceed with the highest ranked option, a mandatory phase out of sale or distribution.

5 Outline of proposal

Proposed mandatory phase out of sale or distribution

The option selected for consultation is a mandatory phase out of sale or distribution of single-use plastic shopping bags, summarised in table 3. All assessed options are summarised in appendix 3.

Table 3: Summary of proposal

	Coverage				
Option	**What (scope)**	**Who**	**When**	**Exemptions**	**Offences and penalties**
Option 1: Mandatory phase out of sale or distribution	Single-use plastic shopping bags[1] *The maximum level of thickness for these bags is to be determined after consultation*	Any person or entity[13] selling or distributing these bags	When sold or distributed for the purpose of carrying sold goods	*To be determined after consultation*	Section 65 Waste Minimisation Act: Persons knowingly contravening regulations made under section 23(1)(b) are liable to a fine of up to $100,000 Persons doing various acts to obstruct an enforcement officer or auditor's activities, or inciting another person to do these, are liable to a fine of up to $5000. Section 67 Waste Minimisation Act: For any of the above offences, a court can order the person to pay an additional penalty for commercial gain flowing from the offence.

[1] A new plastic bag (including one made of degradable plastic) which has handles and is below a maximum level of thickness. The terms 'plastic' and 'degradable' (including 'biodegradable', 'compostable' and 'oxo-degradable') would be defined in regulations with reference to international standards. We are seeking your views on the maximum level of thickness for these bags (see the 'Which bags are covered' section below).

Once the mandatory phase out was complete, consumers would no longer have access to 'free' single-use plastic shopping bags, but would need to obtain multiple-use carry devices for the items they buy. The net cost per use for consumers would depend on the type of bags they chose and whether they used those bags to the end of their full lifespan. The unit price is not high for the currently available multiple-use bags, and consumers already have considerable choice.

Some consumers on low incomes may nonetheless find the up-front cost of multiple-use bags unaffordable. One possibility is to provide support, such as offering discounted bags to holders of Community Services Cards and Gold Cards.

[13] Technically, any natural person or legal person.

Currently retailers pass on the cost of 'free' bags to consumers in the price of goods. With a mandatory phase out the savings made by retailers[14] may be a windfall profit, be used to offset costs for new systems and training in their stores, or be shared with consumers or the community in some form. Retailers not already selling multiple-use bags would obtain a new revenue stream.

Question 1

Do you agree with the proposed mandatory phase out of the sale or distribution of single-use plastic shopping bags in New Zealand, including those made of degradable (eg, oxo-degradable, biodegradable and compostable) plastic?

Yes / No / Not sure

Why / Why not?

Regulations under the Waste Minimisation Act

Section 23(1)(b) of the Waste Minimisation Act (WMA) provides for making regulations:

> controlling or prohibiting the manufacture or sale of products that contain specified materials.

We propose using this provision to put in place a mandatory phase out of single-use plastic shopping bags in New Zealand.[15] At the end of the proposed phase-out period of at least six months after regulations are Gazetted, sale or distribution of specified single-use plastic bags would be prohibited.

Note that this phase out would cover the distribution of bags to consumers free of charge, as set out in section 5(1) of the WMA.

To make any regulations under section 23(1)(b) of the WMA, the Minister for the Environment must consider certain matters and follow certain steps. See appendix 3 for an outline of this process.

Section 23 provides that regulations must not be developed unless a reasonably practicable alternative to the specified materials (in this case, numerous reasonably priced alternatives) are available. We consider this requirement would be met for the reasons outlined in the 'Availability of alternatives' part of the section above, but invite your views on this point.

The Governor-General makes regulations under section 23(1)(b) of the WMA (appendix 5) on the Minister for the Environment's recommendation. Before making this recommendation, the Minister must be satisfied that:[16]

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[14] For example, the cost to import New Zealand's plastic shopping bags made from polyethylene was $15 million in 2017 (appendix 1).

[15] See definition of 'single-use plastic shopping bags' on the following page. The 'specified materials' covered by the prohibition would be materials used to make plastic (including biodegradable and compostable plastic), defined in accordance with international standards.

[16] Section 23(2)(b), (3)(b)(ii) and 3(b)(iii) of the Waste Minimisation Act 2008. Note that, before making the regulations, the Minister must also obtain and consider advice of the Waste Advisory Board and be satisfied that adequate consultation has occurred (section 23(3)(a) and (b)(i)).

- a reasonably practicable alternative to the specified materials subject to the control or prohibition is available
- the benefits expected from the regulations are greater than the costs
- the regulations are consistent with New Zealand's international obligations
- the regulations are consistent with the purpose of the WMA.[17]

Coverage of proposed phase out

Overseas models for reducing impacts of single-use plastic shopping bags vary in their scope, materials, and responsible parties. We are including consultation questions to seek your views on details of how we might implement the proposed mandatory phase out.

Which bags are covered

The term **'single-use plastic shopping bags'**, as it is used in this consultation document,[18] means:

> A new plastic bag (including one made of degradable plastic) which has handles and is below a maximum level of thickness. The terms 'plastic' and 'degradable' (including 'biodegradable', 'compostable' and 'oxo-degradable') would be defined in regulations with reference to international standards.

The proposed mandatory phase out would apply to these bags when they are sold or distributed for the purpose of carrying sold goods.

The thinner the plastic bag, the less resilient to wear it is and the more likely it is to be designed and used for single use only. The thinner the bag, the easier it is to be caught by wind and water and disperse into the environment, and the less likely it is to be economical to collect for recycling.

We are seeking your views on the maximum level of thickness for these bags. Options for maximum thickness include (but are not limited to) bags under 50 microns and bags under 70 microns. Examples of shopping bag types and thicknesses are shown in figure 6.

The European Union's 2015 Directive on Reducing Consumption of Lightweight Carrier Bags chose a cut-off point of below 50 microns in bag wall thickness. This represented the vast majority of the plastic carrier bags used in Europe. These bags were less frequently reused than thicker plastic carrier bags, so were more prone to enter the waste and litter streams.

Two main types of plastic bags are used in the retail sector. These are the 'singlet' type bag made of high density polyethylene (HDPE) and the 'boutique style' bag, made of low density polyethylene (LDPE). The HDPE singlet bag is used mainly in supermarkets, take-away food and produce outlets, while the LDPE boutique style bags are used by stores selling higher value goods.

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[17] The purpose of the WMA is to encourage waste minimisation and a decrease in waste disposal to protect the environment from harm and provide environmental, social, economic, and cultural benefits.

[18] In some jurisdictions, the term 'carrier bags' refers to shopping bags and the retail trade uses 'singlet bag' for bags with integrated handles.

HDPE singlet bags are often below 35 microns in thickness, and generally below 50 microns. Standard supermarket single-use plastic shopping bags are less than 35 microns in thickness.

LDPE boutique style bags are generally between 50 and 70 microns. A wide range of retailers (eg, clothing, shoe, book and giftware shops, and department stores) give out free heavier-weight (35–70 microns thick) plastic shopping bags. Consumers would need to use these bags four to 12 times before they had less impact on climate change than the lighter-weight plastic shopping bags (table 7 in appendix 2).

Some jurisdictions have also controlled thicker single-use shopping bags. For example, Montreal (Canada) has banned all plastic shopping bags less than 50 microns thick, while England has included shopping bags under 70 microns thick in its mandated minimum charge.[19]

Table 4: Examples of shopping bags: single and multiple use, by thickness and material

	Thickness in microns	Bag type	Design usage	Material
	**Less than 35**	Singlet-style checkout bags	Single-use	HDPE (high density polyethylene) Can include 'compostable' and 'degradable'
	**35 or more, and less than 50**	Heavier weight singlet bags, and light-weight boutique-style shopping bags	Single- or multi-use	LDPE (low density polyethylene) Can include 'compostable' and 'degradable'
	**50 or more and less than 70**	Boutique-style shopping bags Includes 'emergency' LDPE multi-use bags, and some nylon multi-use bags	Single- or multi-use	LDPE (low density polyethylene) Can include 'compostable' and 'degradable', Some lightweight nylon fabrics
	**70 or more**	Heavier weight reusable bags of a range of fabrics and composites These types of bags are typically measured by weight (gsm – grams per square metre) not thickness	Multi-use	Non-woven polypropylene, plain or coated Hessian with plasticised lining and padded cotton handles Canvas, hessian, recycled fabric, woven polypropylene Lightweight nylon fabric

Note: 1 microns is 0.001 millimetre (eg, 1,000 microns = 1 mm). Photo credit: Miranda Grimmer

[19] http://ville.montreal.qc.ca/portal/page?_pageid=7418,142803238&_dad=portal&_schema=PORTAL; https://www.gov.uk/guidance/carrier-bag-charges-retailers-responsibilities.

In Queensland, along with its ban on lightweight bags, the Government announced an intention to work with department stores to implement voluntary actions and participate in a national initiative by major retailers to reduce the use of the heavier-weight bags (Department of Environment and Heritage Protection, 2016).

In Tasmania and the Australian Capital Territory there have been reports of shoppers buying heavier-weight bags but treating them as single-use bags, and government consideration of whether to widen their ban to include heavier bags.[20]

In the current transitional period for the bans in Queensland and Western Australia there have been concerns about retailers being sold 'barely compliant' bags just over 35 microns in thickness. Joint government and retail association guidance has been provided to retailers.[21]

New Zealand companies currently pursuing a voluntary phase out of single-use plastic shopping bags are considering middle-weight multi-use plastic bags as alternatives for customers to purchase. Our understanding is that these are between 50 and 70 microns.

We are proposing that the mandatory phase out include single-use shopping bags made of plastic that is 'degradable', including 'biodegradable', 'compostable' and 'oxo-degradable'. This is because oxo-degradable bags are designed to degrade into microplastics, and biodegradable and compostable shopping bags rarely enter the type of environment they are designed to fully degrade in. Thus these types of plastic do not currently offer less risk of environmental harm.

Question 2

We have proposed a mandatory phase out of single-use plastic shopping bags. This could include under 50 microns or under 70 microns in thickness.

If you agree with a mandatory phase out, which option do you prefer, and why?

a. less than 50 microns in thickness
b. less than 70 microns in thickness
c. other (please specify)

Question 3

Are you aware of types of single-use plastic shopping bags that should be exempt from a mandatory phase out?

Yes / No / Not sure

If yes, what are they and why should they be exempt?

[20] https://www.themercury.com.au/news/tasmania/jury-still-out-on-plastic-bag-ban-success/news-story/36fc7a481c1da865f55adf716740cdf4; https://www.canberratimes.com.au/national/act/environment-commissioner-to-review-acts-plastic-bag-ban-amid-concerns-20180126-h0onn5.html.

[21] http://qldbagban.com.au/the-risk-of-using-lightweight-plastic-singlet-bags; https://bagbanwa.com.au/the-risk-of-barely-compliant-bags/.

Who is covered

In establishing a phase out, it is essential to define who and what the new rules would apply to.

Most plastic shopping bag control models from overseas require retailers to implement the changes, and the liable parties are retailers not consumers. However, there is variation in which retailers are covered. We are proposing all retailers be covered, but have also asked a consultation question on whether smaller retailers should be excluded, and if so how that should be defined.

While large retailers distribute a significant share of single-use plastic shopping bags because of their large sales volumes, many of the bags that contribute to litter on land and in the sea may come from takeaway food and beverages, which are often from smaller businesses.

Larger retailers may be better able to absorb the cost of changes resulting from a mandatory phase out of single-use plastic shopping bags. However, regardless of the size of the retailer, they are all likely to pass on any such costs to consumers.

When the mandated charge on single-use plastic shopping bags was introduced in England in 2015, it applied to all 'large' retailers – defined as those employing 250 or more full-time equivalent employees in a year for the whole company, including across multiple stores. In early 2018 however, the British Government was considering extending the levy to all retailers.[22]

The Hong Kong levy, which began in 2009, applied to 3300 larger retailers. The levy did not achieve the waste minimisation outcome sought, and in 2015 the system was changed to a mandated minimum charge that applied to all 60,000 retailers (table 1).

Question 4

Do you currently manufacture, sell, provide or import for sale or personal use these types of single-use plastic shopping bags:

a. 50 microns or less in thickness
b. more than 50 microns and less than 70 microns in thickness?

Yes / No

If yes, please specify which bags and explain how a phase out would be likely to impact on you.

Question 5

Should smaller retailers be exempted from a mandatory phase out of single-use plastic shopping bags?

Yes / No / Not sure

Why / Why not?

[22] http://www.bbc.com/news/uk-42630898.

Question 6

If smaller retailers are exempted from a mandatory phase out of single-use plastic shopping bags and they are defined by their number of full-time equivalent employees, what should that number be?

Timeframe for mandatory phase out

A phase-out period is proposed to allow retailers to use existing stocks of single-use plastic shopping bags and to allow customers who do not already use multiple-use bags to adapt to alternatives. The proposed phase-out period is at least six months from when regulations are Gazetted, subject to the results of consultation.

New Zealand is a party to the WTO Agreement on Technical Barriers to Trade (TBT Agreement). Most, if not all, of the single-use plastic shopping bags we use are imported and the proposed mandatory phase out would fall under the TBT Agreement. This agreement requires a reasonable interval between the publication of technical regulations and their entry into force to allow time for producers in exporting countries, particularly in developing countries, to adapt their products or methods of production. This period is usually six months, as was the case with the plastics microbeads ban.

Overseas prohibitions have been put in place using phase-out periods of differing time lengths. For example, in Queensland the passage of legislation was in September 2017, and prohibition took place from 1 July 2018: a phase-out period of nine months.[23]

In Western Australia, a ban was announced in September 2017 and brought into effect on 1 July 2018, a nine month phase-out period. However, as the consultation pointed out a need for a longer phase-out period for retailers to use existing stocks of single-use plastic shopping bags, the imposition of fines for non-compliance was extended an additional six months.[24]

Question 7

The proposed mandatory phase-out period for single-use plastic shopping bags is at least six months from when regulations are Gazetted, subject to consultation. Do you agree with this timing?

Yes / No / Not sure

Why / Why not?

If no, what do you think would be a more appropriate phase-out period?

a. two months
b. nine months
c. one year
d. other (please specify)

[23] https://www.legislation.qld.gov.au/view/html/asmade/act-2017-031.

[24] https://www.perthnow.com.au/news/environment/plastic-bag-ban-wa-retailers-will-not-be-fined-until-2019-ng-b88866396z.

Question 8

Do you agree that the benefits expected from implementing a mandatory phase out of single-use plastic shopping bags exceed the costs expected from implementing the phase out?

Yes / No / Not sure

Why / Why not?

Please consider both monetary and non-monetary costs and benefits (those that can be measured by money as well as those that can't).

Encouraging high re-use rates for multiple-use shopping bags

The number of uses for multiple-use shopping bags depends on consumer behaviour. Even the standard supermarket single-use plastic shopping bag is often reused for bin liners and other uses. Life-cycle studies generally assume 40 per cent of these bags will be used once more before being thrown away.

To achieve a net benefit for the environment, taking account of the environmental impacts of producing alternative multiple-use shopping bags, consumers need information and incentive to use a bag a sufficient number of times to offset its impacts across the life of the bag.

Some retailers in New Zealand have voluntary schemes in place to encourage customers to reuse multiple-use bags. For example, some New World supermarkets currently offer a five cent rebate per bag for customers using their own multiple-use bags instead of taking a single-use plastic shopping bag.[25]

The Irish levy and minimum charges in the United Kingdom inspired a voluntary 'Bags for Life' scheme in those countries. Countdown has recently brought the concept to New Zealand with its 'Bags for Good' scheme.[26] This approach offers a free replacement bag to consumers when they bring in a worn-out multiple-use bag they have previously bought from the store, and the worn-out bag is put into a recycling system. In theory, this could lower the net cost of multiple-use bags for consumers, improve return rates of bags for recycling, and so improve the life-cycle impacts of multiple-use shopping bags to some extent.

However, in Wales, which has a minimum charge on lightweight plastic shopping bags but no minimum charge on the heavier-weight plastic bags-for-life, 32 per cent of households had disposed of a plastic bag-for-life within the last year and only 0.3 per cent of consumers had returned bags to the retailer to get a replacement bag-for-life once it had worn out (Ricardo-AEA, 2014). Thus the potential life-cycle environmental benefits from the policy were compromised.

A number of volunteer community recycled fabric sewing projects in New Zealand encourage local people to create bags from recycled fabric to use and share for reuse. Boomerang Bags is

[25] http://www.newworld.co.nz/about-us/news/whats-next-for-bags, accessed 4 June 2018.

[26] https://www.countdown.co.nz/plastic-bags, accessed 4 June 2018.

one example.[27] Making the bags from reused fabrics reduces the original production impacts of the fabric, and the bag itself does not have the same life-cycle impacts as a bag made from, for example, virgin cotton.

Some options for increasing consumer knowledge and action to minimise the life-cycle impacts of alternative bags could include voluntary or mandatory incentive schemes by retailers, or a national information campaign and mobile phone app for shoppers by a national body or government. We have included a consultation question to seek feedback on how to better encourage more multiple use of shopping bags.

Question 9

Do you think that reasonably practicable alternatives to single-use plastic shopping bags exist in New Zealand?

Yes / No / Not sure

Why / Why not?

If no, what do you think is missing currently that would need to be available?

Question 10

How can people be encouraged to reuse multiple-use shopping bags enough times to offset the environmental impacts of producing them? (select one or more)

a. voluntary incentive schemes by individual retailers
b. national information campaign and mobile phone app for shoppers
c. other (please specify)

Question 11

What would help you and your family adjust to life without single-use plastic shopping bags?

Monitoring progress

To know whether the desired outcomes of a phase out are being achieved, it will be necessary to have an agreed and transparent baseline and way to monitor changes in single-use plastic bag use and presence in litter, and clear targets. We propose working with stakeholders during the consultation period to put these in place.

For coastal litter, New Zealand will have a good baseline and monitoring system by April 2021 through a Sustainable Coastlines project supported by the Waste Minimisation Fund.[28]

We welcome feedback on an improved measurement and monitoring regime for use of single-use plastic shopping bags, and more widely, single-use plastics entering the market. We have asked a consultation question about how data and monitoring of progress can be improved.

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27 http://boomerangbags.org; https://www.facebook.com/boomerangbagsnz.

28 Funding of just under $2.7 million will provide by April 2021: design and build an open-sourced national litter database and train and support citizen scientists to gather beach litter data nationwide; design and build a litter education curriculum and train and support educators to deliver it. Agency partners include the Ministry for the Environment, Statistics New Zealand, and the Department of Conservation.

Question 12

How can data on single-use plastic shopping bags and other single-use plastics entering the market and monitoring of reductions be improved?

Compliance and enforcement

Enforcement of WMA regulations is by enforcement officers appointed by the Secretary for the Environment. A mandatory phase out of single-use plastic shopping bags may be largely self-policing through consumer complaints or may require additional enforcement officers to be appointed and resourced. Penalties in the WMA for non-compliance are summarised in table 3.

For the plastic microbeads prohibition, the Environmental Protection Authority (EPA) has enforcement officers appointed to enforce it. If the EPA is to also enforce a phased in prohibition of single-use plastic shopping bags then resourcing and potential revision to their governing legislation are likely to be required.

Question 13

Please provide any additional comments or suggestions about the proposed mandatory phase out of single-use plastic shopping bags.

6 Consultation process

How to make a submission

The Government welcomes your feedback on this consultation document. The questions asked in section 5 and summarised in this section are a guide only, and all comments are welcome. You do not have to answer all the questions.

To ensure others clearly understand your point of view, you should explain the reasons for your views and provide supporting evidence where appropriate.

You can make a submission in three ways.

- Use our online submission tool, available at www.mfe.govt.nz/consultation/plasticshoppingbags
  This is our preferred way to receive submissions.
- Download a copy of the submission form to complete and return to us. This is available at www.mfe.govt.nz/consultation/plasticshoppingbags. If you do not have access to a computer, we can post a copy of the submission form to you.
- Write your own submission.

If you are posting your submission, send it to: Proposed Mandatory Phase Out of Single-use Plastic Shopping Bags, Ministry for the Environment, PO Box 10362, Wellington 6143. Include:

- the title of the consultation (Proposed Mandatory Phase Out of Single-use Plastic Shopping Bags)
- your name or organisation
- your postal address
- your telephone number
- your email address.

If you are emailing your submission, send it to plasticshoppingbags.submissions@mfe.govt.nz as a:

- PDF
- Microsoft Word document (2003 or later version).

Submissions close at 5.00 pm on Friday 14 September 2018.

Contact for queries

Please direct any queries to:

Email: plasticshoppingbags.submissions@mfe.govt.nz

Postal: Proposed Mandatory Phase Out of Single-use Plastic Shopping Bags, Ministry for the Environment, PO Box 10362, Wellington 6143

Consultation questions

Question 1

Do you agree with the proposed mandatory phase out of the sale or distribution of single-use plastic shopping bags in New Zealand, including those made of degradable (eg, oxo-degradable, biodegradable and compostable) plastic?

Yes / No / Not sure

Why / Why not?

Question 2

We have proposed a mandatory phase out of single-use plastic shopping bags. This could include under 50 microns or under 70 microns in thickness.

If you agree with a mandatory phase out, which option do you prefer, and why?

a. less than 50 microns in thickness
b. less than 70 microns in thickness
c. other (please specify)

Question 3

Are you aware of types of single-use plastic shopping bags that should be exempt from a mandatory phase out?

Yes / No / Not sure

If yes, what are they and why should they be exempt?

Question 4

Do you currently manufacture, sell, provide or import for sale or personal use these types of single-use plastic shopping bags:

a. 50 microns or less in thickness
b. more than 50 microns and less than 70 microns in thickness?

Yes / No

If yes, please specify which bags and explain how a phase out would be likely to impact on you.

Question 5

Should smaller retailers be exempted from a mandatory phase out of single-use plastic shopping bags?

Yes / No / Not sure

Why / Why not?

Question 6

If smaller retailers are exempted from a mandatory phase out of single-use plastic shopping bags and they are defined by their number of full-time equivalent employees, what should that number be?

Question 7

The proposed mandatory phase-out period for single-use plastic shopping bags is at least six months from when regulations are Gazetted, subject to consultation. Do you agree with this timing?

Yes / No / Not sure

Why / Why not?

If no, what do you think would be a more appropriate phase-out period?

a. two months
b. nine months
c. one year
d. other (please specify)

Question 8

Do you agree that the benefits expected from implementing a mandatory phase out of single-use plastic shopping bags exceed the costs expected from implementing the phase out?

Yes / No / Not sure

Why / Why not?

Please consider both monetary and non-monetary costs and benefits (those that can be measured by money as well as those that can't).

Question 9

Do you think that reasonably practicable alternatives to single-use plastic shopping bags exist in New Zealand?

Yes / No / Not sure

Why / Why not?

If no, what do you think is missing currently that would need to be available?

Question 10

How can people be encouraged to reuse multiple-use shopping bags enough times to offset the environmental impacts of producing them? (select one or more)

a. voluntary incentive schemes by individual retailers
b. national information campaign and mobile phone app for shoppers
c. other (please specify)

Question 11

What would help you and your family adjust to life without single-use plastic shopping bags?

Question 12

How can data on single-use plastic shopping bags and other single-use plastics entering the market and monitoring of reductions be improved?

Question 13

Please provide any additional comments or suggestions about the proposed mandatory phase out of single-use plastic shopping bags.

Publishing and releasing submissions

All or part of any written submission (including names of submitters) may be published on the Ministry for the Environment's website, www.mfe.govt.nz. Unless you clearly specify otherwise in your submission, the Ministry will consider that you have agreed to have your submission and your name posted on its website.

Contents of submissions may be released to the public under the Official Information Act 1982, if requested. Please let us know if you do not want some or all of your submission released, stating which part(s) you consider should be withheld and the reason(s) for withholding the information.

Under the Privacy Act 1993, people have access to information held by agencies about them. Any personal information you send to the Ministry with your submission will only be used in relation to matters covered by this document. In your submission, please indicate if you prefer we do not include your name in the published summary of submissions.

Appendix 1: Estimates for single-use plastic shopping bag use in New Zealand

According to estimates from Retail New Zealand and The Packaging Forum, New Zealand uses about 750 million to 760 million single-use plastic shopping bags each year. This estimate equates to about 154 to 156 bags per person per year.[29]

This estimate is based on surveys of industry members and industry data for sales of 'fast-moving consumer goods'. The Packaging Forum has also estimated quantities for a wide range of plastic bags used in the packaging of 'fast-moving consumer goods', including, for example, bread, chippies, biscuits, sweets, sanitary paper, and frozen food. This estimate is around 1.5 billion plastic bags per year, or about 6000 tonnes.[30]

The net tonnage of all waste disposed to municipal (household) landfill for the 2015/16 financial year in New Zealand was 3.3 million tonnes (Ministry for the Environment, 2017b). Thus plastic bags from 'fast-moving consumer goods', as estimated by industry, are about 0.02 per cent by weight of total waste disposed of in levied landfills. Single-use plastic shopping bags are an estimated 51 per cent of that, or 0.01 per cent of waste by weight to levied landfills.

Our understanding is that all single-use plastic shopping bags are imported. New Zealand import statistics on these bags are reported by value, but not count or weight. These statistics show increasing import values from 2007 to 2017. The value of imported single-use plastic shopping bags made of polyethylene in 2017 was $15 million.[31]

In 2002, Plastics New Zealand estimated each person uses 250 single-use plastic shopping bags a year, and in 2005 the New Zealand Packaging Council estimated this to be 322.5 bags (Tough, 2007). Combining this with the current estimated population gives a range of 1200 million to 1570 million single-use plastic shopping bags per year.

In Australia each person used an estimated 299 single-use plastic shopping bags a year during a voluntary national ban on those bags by major retailers (AGC and Nolan ITU, 2002, 2006, cited in Tough, 2007). We might assume that New Zealand patterns of use are not substantially different from Australia's and, as multiple-use shopping bag options have grown over recent years, may have begun to approach the Australian rates during its voluntary ban. Combining this Australian estimate with the current New Zealand population would give an annual consumption estimate of 1459 million bags per year.

These estimates are compared with other overseas data in figure 6.

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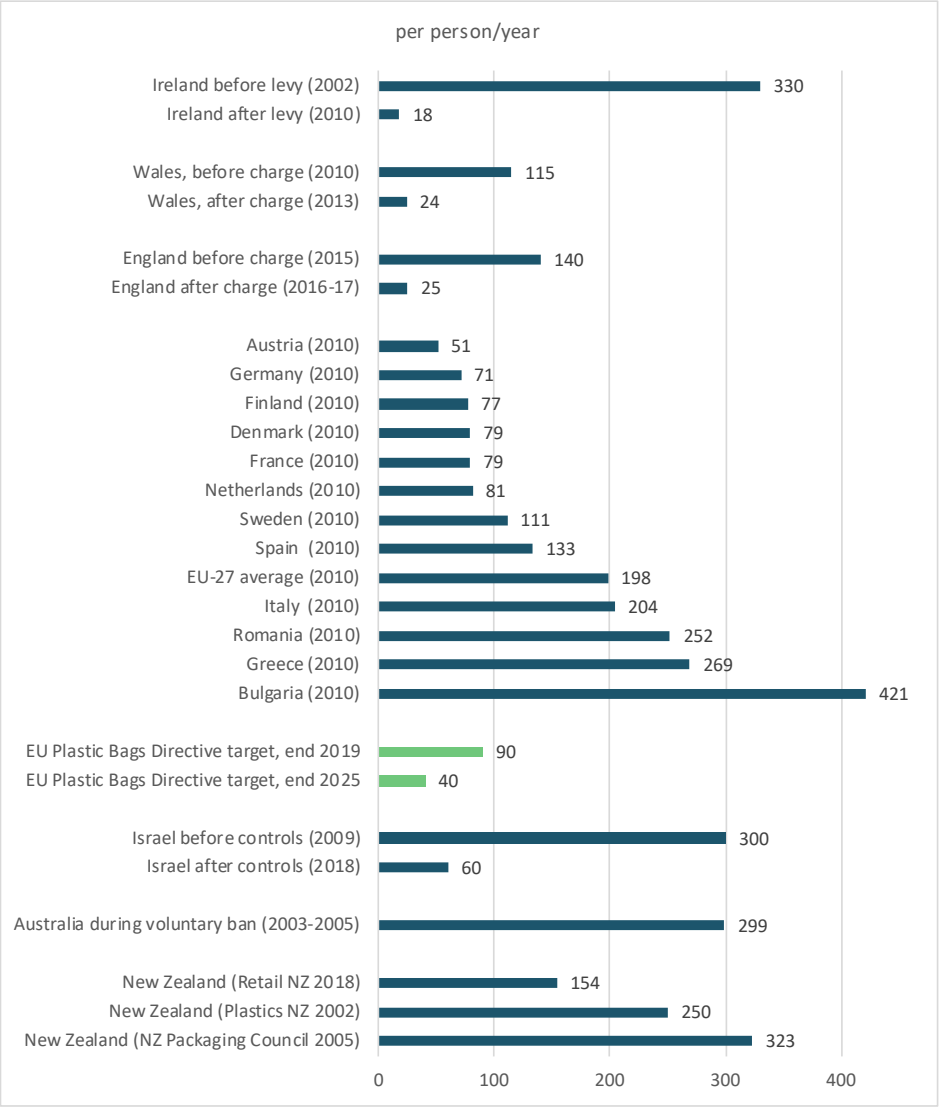
[29] G Harford, Retail NZ, *pers comm* 18 May 2018; L Mayes, The Packaging Forum *pers comm* 6 December 2017; Statistics New Zealand 'population clock' for 20 May 2018: 4.88 million.

[30] Based on information supplied by data from and Soft Plastics Recycling scheme member companies and Aztec MAT data to the end of April 2017.

[31] Tariff code 3923-21-0100: "Ethylene polymers: bags made of plastic sheeting, whether or not printed, with handles, for the conveyance or packing of goods, not designed for prolonged use". Total value in 2017 including freight and insurance was $15,249,971, and the value for duty was $14,798,069.

To measure the progress of any phase-out method, we will need an agreed baseline indicator and a monitoring programme. We welcome feedback on this topic.

Figure 6: International comparison: use rates of single-use plastic shopping bags, number of bags per person per year



Sources: Ayalon, 2009; BIO Intelligence, 2011 (Figure 3 and Annex B); Convery et al, 2007; Department for Environment, Food and Rural Affairs, 2017; European Union, 2015; Retail NZ, 2018 and Packaging Forum, 2017 (*pers comm*); Tough, 2007 (citing AGC and Nolan ITU, 2002 and 2006, Plastics NZ, 2002 and NZ Packaging Council, 2005); WRAP (nd).

Appendix 2: Comparing life-cycle impacts of different types of shopping bags

All types of shopping bags use energy and resources and cause environmental impacts (embodied impacts) in their production, in addition to impacts on the environment when they are disposed of. Typically, multiple-use shopping bags embody more resources and energy because of their heavier weight. If they are not reused a sufficient number of times, they may have greater net environmental impact than single-use plastic bags.

Published life-cycle analyses of bags exclude a number of impacts that must be considered separately. These include litter impacts on land and impacts of plastic on marine ecosystems.

Decisive in the outcome of any life-cycle analysis are assumptions about how many times bags are reused. This includes reuse of shopping bags designed for a single shopping trip. A life-cycle impact study for the UK market considered this aspect. It included various assumptions about how customers reused 'single-use' bags such as for bin liners and to carry wet items. For climate change impacts only, and compared with single-use plastic shopping bags that were not reused, paper shopping bags would need to be reused three times to have less impact than a single-use plastic shopping bag. If a single-use bag were reused three times, a non-woven polypropylene multiple-use bag would need to be reused 33 times, and a cotton bag 393 times to have less climate change impact (table 5).

Table 5: The number of times a reusable bag would need to be used to have less global warming potential of an HDPE bag (single-use less than 35 microns) with and without secondary reuse, data for the UK market

	Reuse rate of single-use HDPE bags			
		Reused once as a bin liner		
Multiple-use bag type	Not reused	40% of time	100% of time	Reused for other purposes 3 times
Paper bag	3	4	7	9
LDPE thicker glossy plastic	4	5	9	12
Non-woven PP plastic	11	14	26	33
Cotton	131	173	327	393

Note: HDPE = high-density polyethylene; LDPE = low-density polyethylene; PP = polypropylene.

Source: UK Environment Agency (2011)

Life-cycle analysis for Victoria (Australia) showed that reusable shopping bags have a lower net environmental impact than single-use plastic shopping bags for four impact measures: greenhouse gas emissions, litter production, energy use, and water use. Environmental impacts were further reduced when the recycled content of bags increased. The greatest environmental benefits were found for reusable, non-woven polypropylene bags (Hyder Consulting Pty Ltd, 2007).

Looking at a wider range of impacts, the results are more complex, and recommended reuse rates higher. For example, a Danish study of embodied life-cycle impacts over 14

measures[32] found that people had to reuse paper and biodegradable plastic bags 42 or 43 times before those bags had less impact than a single-use plastic shopping bag; for multiple-use polypropylene shopping bags the reuse rate was 45 to 52 times, and for cotton shopping bags it was 7100 times (table 6).

Part of the context of the Danish study is that the majority of non-recycled waste is incinerated for energy. This energy offset is included in the life-cycle impacts, and lightweight shopping bags are estimated to provide the overall lowest environmental impacts if recommended reuse rates of other bags were not followed. For all shopping bags, this study also strongly recommended reuse as many times as possible before disposal.

Table 6: The number of times a reusable bag would need to be used to have less impact than a lightweight LDPE, over 14 environmental impact measures, data for the Danish market

	Recommended reuse rates to have less impact than single-use LDPE bag with rigid handles	
Shopping bag type	**Climate change impacts only**	**All 14 impacts assessed[1]**
Recycled content LDPE bag[2]	1	2
Polyester bags	2	35
Biopolymer bags	0	42
Unbleached paper bags	0	43
Bleached paper bags	1	43
PP bag, non-woven	6	52
PP bags, woven	5	45
Composite bags	23	870
Conventional cotton bags	52	7,100
Organic cotton bags[3]	149	20,000

Note: LDPE = low-density polyethylene; PP = polypropylene composite bags: 80% jute, 10% PP, 10% cotton.

1. The environmental impacts analysed were: climate change, ozone depletion, human toxicity (cancer and non-cancer effects), photo-chemical ozone formation, ionising radiation, particulate matter, terrestrial acidification, terrestrial eutrophication, freshwater eutrophication, ecosystem toxicity, and resource depletion (fossil and abiotic). Depletion of water resource was also taken into account.
2. Lightweight shopping bags in the Danish market are typically LDPE (low-density polyethylene) rather than HDPE (high-density polyethylene) as in the New Zealand market.
3. This study assumed that organic cotton production yields a third the fibre of conventional cotton production, which results in three times the embodied impact. Impact to sustainability of soils was not included, and toxicity impacts were equal-weighted with other impacts.

Source: Danish Environmental Protection Agency (2018)

One argument is that people who currently use their 'free' single-use plastic shopping bags for other purposes such as to line their kitchen rubbish bin will buy other plastic bags under a prohibition or levy. If the new bags were heavier than shopping bags, the net impact may

[32] The environmental impacts analysed were: climate change, ozone depletion, human toxicity (cancer and non-cancer effects), photo-chemical ozone formation, ionising radiation, particulate matter, terrestrial acidification, terrestrial eutrophication, freshwater eutrophication, ecosystem toxicity, and resource depletion (fossil and abiotic). Depletion of water resource was also taken into account. This does not include litter or impacts of marine plastics.

increase. However, the available evidence points in the opposite direction. For example, in Australia during a voluntary national ban by major supermarkets, the reduction in single-use plastic shopping bags was much greater than the increase from purchase of kitchen tidy bags; over 18 times by count and over 10 times by weight (BIO Intelligence Service, 2011, annex B).[33]

Limited evidence available from neighbouring communities with and without bans suggests the use of heavier multiple-use bags does not increase total disposal weights from shopping bags. For example, a ban in the city of Austin, Texas in the USA decreased single-use plastic shopping bags in the city's waste stream by 75 per cent compared with neighbouring communities. The proportion of waste that was shopping bags (all types, single and multiple use, total weight) was the same for both catchments (Waters, 2015). Without data on how often people had used multiple-use bag types before throwing them away, we cannot conclude whether net life-cycle environmental impacts improved significantly.

Published life-cycle analysis studies compare new virgin material and new manufactured bags with recycled content shopping bags. None considers reuse of material that would otherwise go to landfill. Shopping bags made from reused fabric would both lessen the original production impacts of the reused fabric and not have the same life-cycle impacts as a bag made from, for example, virgin cotton. This more circular approach is present in New Zealand, for example, with Boomerang Bags.[34]

[33] By weight, single-use plastic shopping bags decreased by 10,730 tonnes compared with a 913-tonne increase in kitchen tidy bags. By count, 1880 million fewer single-use plastic shopping bags were used compared with 95 million more kitchen tidy bags.

[34] http://boomerangbags.org ; https://www.facebook.com/boomerangbagsnz.

Appendix 3: Assessment of options for New Zealand

The following proposed criteria have been used to compare options to reduce the impacts of single-use plastic shopping bags in New Zealand. Each option has been assessed as to whether it can:

- substantially advance the phase out of a single-use plastic product that contributes to litter, and the risks associated with marine plastics, while over the longer term take a circular economy approach to design waste out of the system *(primary purpose of intervention: triple weighting)*
- be implemented without placing undue costs on the community, business, or public funds *(key regulatory principle: double weighting)*
- be progressed under existing legislation
- provide a financial incentive to return used shopping bags for reuse or recycling
- transfer funds for community or environmental benefit.

Table 7: Summary of potential options to reduce the impacts of single-use plastic shopping bags

Option	How
1. **Mandatory phase out of sale or distribution**	Regulations under WMA (s 23(1)(b))
2. **Levy, tax or minimum charge** 2A – Levy at point of sale, collected by central government	New legislation: amend the WMA
2B – Mandated minimum charge at point of sale, retained by retailers	New legislation: amend the WMA
2C – Levy or minimum charge at point of sale, set by local authorities	New legislation: amend the WMA or other
2D – Tax at point of entry into market (pre-consumer)	New legislation: amend the WMA or other
3. **Deposit-refund system**	Regulations under WMA (s 23(1)(e))
4. **Formal agreement** between industry and Government	Non-regulatory
5. **Mandatory product stewardship**	*Gazette* notice under WMA (ss 9 and 12), and regulations under WMA
6. **Ad hoc voluntary action** (*status quo*)	Non-regulatory

Note: s = section; ss = sections; WMA = Waste Minimisation Act 2008.

We discuss each option below, and then work through the comparison against the criteria noted above.

Option 1: Mandatory phase out of sale or distribution

Section 23(1)(b) of the Waste Minimisation Act (WMA) provides for making regulations:

> controlling or prohibiting the manufacture or sale of products that contain specified materials.

Section 23 can be used to control or prohibit the distribution of products including to customers for free because section 5(1) of the WMA defines 'sale' to include distribution or delivery whether or not for valuable consideration.

For information on regulatory tests under the WMA see appendix 4 and for the full text of section 23, see appendix 5.

Potential impacts

Bans have significantly reduced the use of single-use plastic shopping bags and their presence in litter overseas (table 1). This kind of prohibition has the potential to do the same in New Zealand.

A prohibition can be implemented by regulation under the WMA rather than requiring new legislation. Due to the relative simplicity of such a measure, administrative and transaction costs are likely to be less than the other options that can be implemented by regulation (Options 3 and 4), and significantly less than those that would require new legislation (varieties of Option 2). Enforcement costs are likely to be similar.

Once a prohibition was introduced, consumers would no longer have access to 'free' single-use plastic shopping bags. On an ongoing basis, consumers would need to purchase (where needed) and reuse multiple-use carry devices for the items they buy. The net cost per use for consumers would depend on the type of bags they chose and whether they used those bags to the end of their full lifespan. The unit price is not high for the currently available multiple-use bags, and consumers already have a wide range of bags to choose from.

Some consumers on low incomes may nonetheless find the up-front cost of multiple-use bags unaffordable. One possibility is to provide support when introducing a mandatory phase out, such as by offering discounted bags to holders of Community Services Cards and Gold Cards, or making exemptions.[35]

Currently retailers pass on the cost of 'free' bags to consumers in the price of goods, so people who rarely use single-use bags are in effect subsidising high users. If a mandatory phase out took place, retailers could use the savings made from not having to give away single-use bags,[36] to offset new bag systems in their stores or provide free or discounted multiple-use bags during the transition period. They would also gain a new or increased revenue stream from the sale of reusable bags.

A mandatory phase out would bring new costs for public education, monitoring, and enforcement. If central government was taking these actions, taxpayers would bear the costs, while ratepayers would if local authorities had a role.

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[35] For example, with the bag ban in the city of Austin in the USA, residential customers could apply for a variance on the grounds of hardship, leading to 38 applications received and approved. An option of 'alternative compliance' was also available for businesses on the grounds of hardship; 45 businesses applied for it, and 32 were approved (Waters, 2015).

[36] For example, the cost to import New Zealand's plastic shopping bags made from polyethylene was $15 million in 2019 (appendix 1).

Options 2A, 2B, 2C, 2D: Increased price (levy, mandated minimum charge, or tax)

Charging taxes or levies requires specific authorisation from Parliament, and a tax may only be imposed by or under an Act. The WMA is silent about taxes or levies on products, so it would need to be amended in Parliament to authorise this approach. Section 23(1)(d) enables making regulations that impose fees payable for the 'management' of a product, but this would have to be linked to actual costs for waste treatment and disposal. For the full text of section 23, see appendix 4.

Four options are available as increased price initiatives: having a levy at point of sale, which central government collects (2A); setting a compulsory minimum charge (2B); having a levy or minimum charge at point of sale, which local authorities set (2C); and setting a tax that must be paid before the bags enter the market (before they reach the consumer) (2D).

Potential impacts

Initiatives that increase the price of single-use plastic shopping bags have significantly reduced their use and their presence in litter overseas (table 1). They have the potential to do the same in New Zealand.

To maintain the results we are seeking, overseas evidence suggests that increasing the value of the levy over time may be necessary. In Ireland, the rate started at €0.15 per bag (NZ 25 cents). Then, when bag use started to rise again, it was raised to €0.44 (NZ 67 cents) and use rates went back down (Convery et al, 2007). In contrast, in South Africa, use rates decreased 76 per cent after the levy was introduced, but the levy rate was not increased and use rates returned to original levels after six years (Dikgang et al, 2012).

Due to the need to implement new legislation, and monitor and potentially increase the charge over time, administrative and transaction costs are likely to be significantly higher than the options that can be implemented by regulation (Options 1, 3 and 4). Enforcement costs are likely to be similar.

Under a levy system, consumers would still have the option of using single-use plastic shopping bags, but those bags would no longer be 'free'. If they did not already use multiple-use bags, they would face a new small charge – either for single-use bags each time they buy something, or as up-front costs for new multiple-use bags.

Some consumers on low incomes may find the up-front cost of multiple-use bags unaffordable. One possibility is to provide support when introducing an increased price, such as by offering discounted bags to holders of Community Services Cards and Gold Cards, or making exemptions.

Where retailers keep the money from bag sales with a government expectation that they will use them for charitable donations, the funds for community groups can be substantial. In Wales, the first three years of the bag charge resulted in donations of an estimated £17–£22 million (NZ$33–$43 million). The British bag charge has had reported donations from two-thirds of the liable retailers, totalling over £66 million (NZ$128 million) or 4 pence (NZ 8 cents) for every single-use bag they sell (Welsh Government 2018; Department for Environment, Food and Rural Affairs, 2017). For the Irish levy, collected into a central environment fund, revenue was €85.3 million (NZ$ 143 million) from 2002 to 2007 (McDonnell and Convery, 2008).

All levy options would place moderate and short-term costs on retailers to adjust till receipts to show the levy, and educate consumers on how the new levy worked. For the Irish levy, these costs were estimated to be €1.2 million economy-wide, including for equipment, promotion and training (Convery et al, 2007).

An initiative that involved charging for bags would bring new costs for public education, monitoring, and enforcement. It is likely that taxpayers would bear these costs as the levy was increased to achieve the desired results. If central government collected the levy, additional new taxpayer costs would be involved in levy collection, enforcement, and the distribution of levy funds. As the use of single-use plastic shopping bags declined, administrative costs would become a higher proportion of the funds collected.

The administrative cost of the Irish levy was minimised by associating it with existing systems for collecting VAT retail sales tax, and has been estimated at 3 per cent of total revenue (Convery et al, 2007; McDonnell and Convery, 2008).

The Hong Kong bag charge in 2009 applied only to large retailers.[37] Under this initiative, they had to submit quarterly returns setting out the number of targeted bags they had distributed to customers and the amount of levy collected. They also had to pay the Government the levy income as stated in the returns. When the levy was expanded in 2015 to cover all retailers, this approach was streamlined to avoid compliance costs for small businesses: retailers could now keep the charge while they were encouraged to donate it to 'suitable environmental causes' (Environmental Protection Department, 2011, 2013).

An initiative to increase price would bring new costs for public education, monitoring, and enforcement. If central government was taking these actions, taxpayers would bear the costs, while ratepayers would if local authorities had a role, as they did with the British levy.

Option 3: Deposit-refund system

Section 23(1)(e) of the WMA provides for making regulations:

> requiring specified classes of person to charge a deposit on the sale of a product, requiring the deposits to be refunded in specified circumstances, and prescribing requirements for the application of any deposits not refunded.

For information on regulatory tests under the WMA see appendix 4 and for the full text of section 23, see appendix 5.

Potential impacts

A deposit-refund system can be implemented by regulation under the WMA rather than requiring new legislation. Due to the relative complexity of requirements for charge and refund, administrative and transaction costs are likely to be more than for a mandatory phase out (Option 1), similar to a product stewardship scheme (Option 5), and significantly less than options requiring new legislation (varieties of Option 2). Enforcement costs are likely to be similar.

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[37] These were 'registered retailers', predominately chain store operators including convenience stores, supermarkets, and retailers of cosmetics and medicine (Environmental Protection Department, 2011).

Many other jurisdictions have used mandated deposit-refund for other products.[38] Their extensive experience suggests the costs and benefits that we might expect in theory by introducing this system for single-use plastic bags. Typically in these overseas programmes, recycling rates go up significantly and fewer of the targeted products enter the litter and waste streams. Ongoing administrative costs are typically covered by unclaimed deposits. However, as these end-of-life products tend to have greater economic value than waste plastic bags, we cannot confidently predict the impact of such a system.

Option 4: Formal agreement between industry and government

Establishing a formal industry agreement could be a non-regulatory measure. It could be a stand-alone initiative, with the Government stating it intended to regulate if the agreement proved ineffective, or as an interim measure while developing regulations.

Potential impacts

Costs and benefits of this option would depend on the nature of the agreement and how willing government and industry stakeholders were to enforce progress toward targets. How much it would improve on the current system in delivering greater net benefit is difficult to determine at this stage.

Option 5: Mandatory product stewardship

If single-use plastic shopping bags were declared a 'priority product' under WMA section 9, a product stewardship scheme would need to be developed for these bags and accredited by the Minister for the Environment. A priority product is declared by Gazette notice from the Minister rather than as a regulation, but would need Cabinet approval to happen.

To be effective, mandatory product stewardship schemes are likely to need to engage 'producers' that bring the product to the market, such as retailers, plastic bag manufacturers, and wholesalers. It would also require guidelines both for accreditation (section 12, gazetted by the Minister) and to prohibit any sale except where it is in line with the scheme (section 22(1)(a), by regulation). For information on regulatory tests under the WMA see appendix 4 and for the full text of section 23, see appendix 5.

Another potential approach under this option is to progress directly to declaration of 'priority product' for all plastic packaging. Alternatively, the system could gradually increase the number of single-use plastics to be covered under 'priority product' status, creating a more comprehensive plastic packaging co-regulatory framework over time.

Potential impacts

A mandatory product stewardship scheme can be implemented by regulation under the WMA, rather than requiring new legislation.

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[38] For example, beverage containers in South Australia, Europe and North America, and vehicles in Norway.

Due to the relative complexity of requirements for scheme guidelines and monitoring of reporting, administrative and transaction costs are likely to be more than for a mandatory phase out (Option 1), similar to a deposit-refund system (Option 3), and significantly less than those that would require new legislation (varieties of Option 2). Enforcement costs are likely to be similar.

A mandatory product stewardship scheme would place new costs on retailers to coordinate a national system. These would include costs for education, administration of membership fees, monitoring, enforcement, and reporting. Retailers would probably pass these costs on to consumers. Depending on the level of costs that are passed on, consumers on low incomes may find the costs unaffordable and need targeted support. Taxpayers would also bear new costs for monitoring and enforcement by government.

Whether the impacts are greater than they are under the present system of ad hoc voluntary actions would depend on the nature and enforcement of targets.

Option 6: Ad hoc voluntary action (*status quo*)

As noted in the first part of this section, some major retailers have announced a commitment to phasing out single-use plastic shopping bags by the end of 2018, and some retailers have already done so.

Potential impacts

Of the eight retail chains pledging to phase out single-use plastic shopping bags (Countdown, New World, Warehouse Group (The Warehouse, Warehouse Stationery, Noel Leeming and Torpedo 7), Z Energy, and Mitre 10), two have publicly announced their current average annual use rates: Countdown (350 million) and Z Energy (2.5 million). It is unclear what proportion of the total estimated 750 million to 1500 million single-use plastic shopping bags per year will be reduced through the present approach or whether the current industry estimates accurately reflect all retailers. We welcome further information on this topic.

The present approach may encourage more major retailers to voluntarily phase out single-use plastic shopping bags. It is less likely to involve most of the smaller retailers and food outlets.

Option assessment

We have used the following proposed criteria to compare options for a phase out of single-use plastic shopping bags. The option can:

- substantially advance the phase out of a single-use plastic product that contributes to litter, and the risks associated with marine plastic, while over the longer term take a circular economy approach to design waste out of the system *(primary purpose of intervention: triple weighting)*
- be implemented without placing undue costs on the community, business, or public funds *(key regulatory principle: double weighting)*
- be progressed under existing legislation

- provide a financial incentive to return used shopping bags for reuse or recycling
- transfer funds for community or environmental benefit.

Ranking each of the options against the above criteria produces the following results (in order from highest to lowest score) (see also table 6).

1 Option 1 – Mandatory phase out of sale or distribution

2= Option 2A – Levy at point of sale, proceeds to central government
2= Option 2B – Mandatory minimum charge, retained by retailer
2= Option 2C – Levy or minimum charge at point of sale, set by local authorities

3 Option 4 – Formal agreement between industry and government

4= Option 6 – Ad hoc voluntary action (*status quo*)
4= Option 3 – Deposit-return system

5 Option 5 – Mandatory product stewardship

6 Option 2D – Tax at entry into market (before bags go to the consumer)

This assessment is based on information from overseas experience, which has gaps in relation to the assessment criteria. We welcome information to help refine this analysis for New Zealand.

Table 8: Assessment of options for phasing out single-use plastic shopping bags against proposed assessment criteria

Assessment criteria	Option 1 Mandatory phase out	Option 2 – Increased price: 2A – Levy to central government	2B – Minimum charge	2C – Levy or charge by councils	2D – Tax (pre-consumer)	Option 3 – Deposit-refund	Option 4 – Formal agreement	Option 5 – Mandatory product steward-ship	Option 6 – Ad hoc voluntary (*status quo*)
Can substantially advance the phase out of a single-use plastic product that contributes to litter and the risks associated with marine plastics while over the longer term take a circular economy approach to design waste out of the system *(primary purpose of intervention: triple weighting)*	Yes *(2 x 3 = 6)*	Yes *(2 x 3 = 6)*	Yes *(2 x 3 = 6)*	Yes *(2 x 3 = 6)*	?	?	?	?	?
Can be implemented without placing undue costs on the community, business, or public funds *(key regulatory principle: double weighting)*	Somewhat *(1x2= 2)*	Somewhat *(1x2= 2)*	Somewhat *(1x2= 2)*	Somewhat *(1x2= 2))*	?	?	Yes *(2x2= 4)*	?	Yes *(2x2= 4)*
Can be progressed under existing legislation	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Can provide a financial incentive to return used shopping bags for reuse or recycling	No	No	No	No	No	Yes	?	?	No
Can transfer funds for community or environmental benefit	No	Somewhat	Somewhat	Somewhat	Somewhat	?	?	?	No
Weighted total score	8	7	7	7	minus1	4	6	2	4
Ranking	1	2=	2=	2=	6	4=	3	5	4=

Scoring: Yes = 2 Somewhat = 1 ? = unknown or no evidence = 0 No = minus 1

Appendix 4: Tests for Waste Minimisation Act regulatory intervention

Waste Minimisation Act (WMA) test	'Priority product' declaration WMA s9	Guidelines for priority product schemes WMA s12	Regulations: priority products and accredited schemes WMA s22	Regulations: products, materials, and waste WMA s23
The product will or may cause significant environmental harm when it becomes waste.	s 9(2)(a)			
Reduction, reuse, recycling, recovery, or treatment of the product has significant benefits.	s 9(2)(a)			
The product can be effectively managed under a product stewardship scheme.	s 9(2)(b)			
The effectiveness of any relevant voluntary product stewardship scheme in terms of s 9(2) criteria has been considered.	s 9(3)(d)			
The public has had an opportunity to comment on the proposal.	s 9(3)(c)			
Public concerns about environmental harm associated with the product when it becomes waste (including concerns about its disposal) have been considered.	s 9(3)(b)			
Advice of the Waste Advisory Board has been obtained and considered.	s 9(3)(a)	s 12(4)(a)	s 22(2)(a)	s 23(3)(a)
Adequate consultation has occurred with people or organisations that may be significantly affected.		s 12(4)(b)	s 22(2)(b)(i)	s 23(3)(b)(i)
Benefits expected from implementing the regulations are greater than the costs expected from implementing the regulations.			s 22(2)(b)(iii)	s 23(3)(b)(ii)
The regulations are consistent with New Zealand's international obligations.			s 22(2)(b)(iv)	s 23(3)(b)(iii)
Without the regulations, the objectives of any relevant accredited scheme, or reductions in harm or waste minimisation from the scheme, or scheme guidelines published under the WMA, cannot be met.			s 22(2)(b)(ii)	
For disposal controls – that adequate infrastructure and facilities are in place to provide a reasonably practicable alternative to disposal or, if not, that a reasonable time is provided before the regulations come into force for adequate infrastructure and facilities to be put in place.				s 23(2)(a)
For product sale controls – that a reasonably practicable alternative to the specified materials is available.				s 23(2)(b)

Appendix 5: Waste Minimisation Act, section 23

The purpose of the Waste Minimisation Act 2008 (WMA) is to encourage waste minimisation to protect the environment from harm and obtain environmental, economic, social, and cultural benefits. Additionally, the purpose of the product stewardship section of the WMA is to encourage (and, in certain circumstances, require) the people and organisations involved in the life of a product to share responsibility for:

- ensuring there is effective reduction, reuse, recycling or recovery of the product
- managing any environmental harm arising from the product when it becomes waste.

The WMA introduced tools including:

- waste management and minimisation plan obligations for territorial authorities
- a waste disposal levy to fund waste minimisation initiatives at local and central government levels
- regulatory powers for products
- product stewardship for specified 'priority products'.

A national strategy was published in October 2010, *The New Zealand Waste Strategy: Reducing harm, improving efficiency*. This set the WMA in the wider context of the legislative toolkit available to manage and minimise waste, and proposed a focus on wastes that pose the highest risk or provide opportunities to improve resource efficiency.

Section 23

23 Regulations in relation to products (whether or not priority products), materials, and waste

(1) The Governor-General may, by Order in Council made on the recommendation of the Minister, make regulations for 1 or more of the following purposes:

Control or prohibition on disposal, sale, etc

(a) controlling or prohibiting the disposal, or anything done for the purpose of disposing, of products or waste:

(b) controlling or prohibiting the manufacture or sale of products that contain specified materials:

Take-back services, fees, and refundable deposits

(c) requiring specified classes of person to provide a take-back service for products, and prescribing requirements for—

(i) the take-back service; and

(ii) the reuse, recycling, recovery, treatment, or disposal of products taken back:

(d) setting fees payable for the management of a product and specifying—

(i) the class or classes of person who must pay the fee; and

(ii) the stages in the life of the product where the fee must be paid; and

(iii) the purposes to which the fee must be applied:

(e) requiring specified classes of person to charge a deposit on the sale of a product, requiring the deposits to be refunded in specified circumstances, and prescribing requirements for the application of any deposits not refunded:

Labelling of products

(f) prescribing requirements for the labelling of a product:

Quality standards

(g) for any product or material that has become waste, prescribing standards to be met when reusing, recycling, or recovering the product or material:

(h) requiring specified persons or specified classes of person to ensure that the standards prescribed under paragraph (g) are met:

Information to be collected and provided

(i) requiring specified persons or specified classes of person to collect, and provide to the Secretary, information about any requirements imposed in regulations made under paragraph (a), (b), (c), (d), or (e):

Miscellaneous

(j) providing for any other matter contemplated by this Part.

(2) The Minister must not recommend the making of regulations—

(a) under subsection (1) (a), unless he or she is satisfied that there is adequate infrastructure and facilities in place to provide a reasonably practicable alternative to disposal or, if not, that a reasonable time is provided before the regulations come into force for adequate infrastructure and facilities to be put in place:

(b) under subsection (1) (b), unless a reasonably practicable alternative to the specified materials is available.

(3) Before recommending the making of regulations under subsection (1), the Minister must—

(a) obtain and consider the advice of the Waste Advisory Board; and

(b) be satisfied that—

(i) there has been adequate consultation with persons or organisations who may be significantly affected by the regulations; and

(ii) the benefits expected from implementing the regulations exceed the costs expected from implementing the regulations; and

(iii) the regulations are consistent with New Zealand's international obligations.

Bibliography

Accinelli C, Saccà ML, Mencarelli M, Vicari A. 2012. Deterioration of bioplastic carrier bags in the environment and assessment of a new recycling alternative. *Chemosphere* 89: 136–143.

Australian Retailers Association. 2005. *Australian Retailers Association Code of Practice for the Management of Plastic Bags Final Report*.

Auta HS, Emenike CU, Fauziah SH. 2017. Distribution and importance of microplastics in the marine environment: A review of the sources, fate, effects and potential solutions*. Environment International* 102: 165–176.

BIO Intelligence Service. (2011) *Assessment of Impacts of Options to Reduce the Use of Single-use Plastic Carrier Bags*. Final Report prepared for the European Commission – DG Environment.

Cadman J, Evans S, Holland M, Boyd R. 2005. *Proposed Plastic Bag Levy – Extended Impact Assessment: Volume 1: Main Report.* Edinburgh: Scottish Executive.

Clunies-Ross PJ, Smith GPS, Gordon KC, Ga, S. 2016. Synthetic shorelines in New Zealand? Quantification and characterisation of microplastic pollution on Canterbury's coastlines. *New Zealand Journal of Marine and Freshwater Research* 50(2): 317–325.

Colmar Brunton. 2017. *Better Futures Report 2017: Sustainable Development Goals*. Colmar Brunton.

Convery F, McDonnell S, Ferreira S. 2007. The most popular tax in Europe? Lessons from the Irish plastic bags levy. *Environmental and Resource Economics* 38: 1–11.

Danish Environmental Protection Agency. 2018. *Life Cycle Assessment of Grocery Carrier Bags. Copenhagen: Danish EPA.*

Department for Environment, Food and Rural Affairs. 2015. *Carrier Bags: Review of Standards for Biodegradable Plastic Bags.* Presented to Parliament pursuant to section 18 of the Single Use Carrier Bags Charges (England) Order 2015.

Department for Environment, Food and Rural Affairs. 2017. *Single-use Plastic Carrier Bags Charge: Data in England for 2016 to 2017.*

Department of Environment and Heritage Protection. 2016. *Implementing a Lightweight Plastic Shopping Bag Ban in Queensland: Discussion paper*.

Department of Primary Industries, Parks, Water and Environment. 2012. *Minor Assessment Statement on Proposed New Tasmanian Legislation – Plastic Shopping Bag Ban Act 2013.* Hobart: Department of Primary Industries, Parks, Water and Environment.

Department of Water and Environmental Regulation. 2017. *Implementing a lightweight single-use plastic bag ban in Western Australia: Discussion paper.* Perth: Government of Western Australia.

Dikgang J, Leiman A, Visser M. 2012. *Elasticity of demand, price and time: lessons from South Africa's plastic-bag levy.* Applied Economics 44(26): 3339–342.

Ehrenberg-Bas Institute for Marketing. 2009. *Plastic Bag Ban Research.* Adelaide: Zero Waste Australia.

Ellen Macarthur Foundation. 2013. *Towards the Circular Economy Vol. 1: An Economic and Business Rationale for an Accelerated Transition*.

Ellen Macarthur Foundation. 2017. *The New Plastics Economy: Rethinking the Future of Plastics & Catalysing Action.*

Emadian SM, Onay TT, Demirel B. 2017. Biodegradation of bioplastics in natural environments. *Waste Management* 59: 526–536.

Environment Protection and Heritage Council. 2008. *Decision Regulatory Impact Statement: Investigation of Options to Reduce the Impact of Plastic Bags.*

Environment and Sustainable Development Directorate. 2014. *Review of the Plastic Shopping Bags Ban.*

Environmental Protection Department. 2011. *Consultation Document on the Extension of the Environmental Levy Scheme on Plastic Shopping Bags.*

Environmental Protection Department. 2013. *Legislative Council Brief: Product Eco-Responsibility (Amendment) Bill 2013*.

Environmental Protection Department. 2016. *Legislative Council Panel on Environmental Affairs: Survey Findings on the Impacts of Plastic Shopping Bag Charging*.

Eriksen M, Lebreton LCM, Carson HS, Thiel M, Moore CJ, Borerro, JC, et al. 2014. Plastic pollution in the world's oceans: More than 5 trillion plastic pieces weighing over 250,000 tons afloat at sea. *PLoS ONE* 9(12): e111913.

European Commission. 2013. *Green Paper: On a European Strategy on Plastic Waste in the Environment.* COM. 2013. 123 final. Brussels: European Commission.

European Union. 2015. *Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags.*

Gall AC, Thompson RC. 2015. The impact of debris on marine life. *Marine Pollution Bulletin* 92: 170–179.

Geyer R, Jambeck JR, Law KL. 2017. Production, use, and fate of all plastics ever made. *Science Advances* 3(7): e1700762.

Godoy DA. 2016. *The Ecology and Conservation of Green Turtles (Chelonia mydas) in New Zealand.* Thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Marine Ecology at Massey University, Albany, New Zealand.

Hyder Consulting Pty Ltd. 2007. *Comparison of Existing Life-cycle Analysis of Shopping Bag Alternatives*. Report for Sustainability Victoria.

Jambeck JR, Geyer R, Wilcox C, Siegler TR, Perryman M, Andrady A, Narayan R, Law KL. 2015. Plastic waste inputs from land into the ocean. *Science* 347(6223): 768–771.

Loughborough University. 2010. *Assessing the Environmental Impacts of Oxo-degradable Plastics Across Their Life Cycle.* London: Department for Environment, Food and Rural Affairs.

McDonnell S, Convery F. 2008. *The Irish Plastic Bag Levy: A Review of Its Performance 5 years on*.

Miller RM. 2012. *Plastic Shopping Bags: An Analysis of Policy Instruments for Plastic Bag Reduction.* Thesis submitted to the Universiteit Utrecht in partial fulfilment of the requirements for the degree of MSc Sustainable Development. Utrecht: Universiteit Utrecht.

Ministry for the Environment. 2014. *New Zealand Packaging Accord 2004*.

Ministry for the Environment. 2017a. *Managing Microbeads in Personal Care Products: Consultation Document.* Wellington: Ministry for the Environment.

Ministry for the Environment. 2017b. *Review of the Effectiveness of the Waste Disposal Levy 2017.* Wellington: Ministry for the Environment.

Ministry for the Environment. 2017c. *Managing Microbeads in Personal Care Products: Summary of Submissions.* Wellington: Ministry for the Environment.

Packaging Council of New Zealand. 2007. *New Zealand Packaging Accord 2004 Year Three Progress Report.* Packaging Council of New Zealand / Accord Secretariat.

Ocean Conservancy and McKinsey Centre for Business and Environment. 2015. *Stemming the Tide: Land-based Strategies for a Plastics-free Ocean.*

Paine, M. 2015. Jury still out on plastic bag success. Hobart: The Mercury.

Parliamentary Commissioner for the Environment. 2018. *Biodegradable and compostable plastics in the environment.*

Rawtec. 2014. *Northern Territory Plastic Bags Ban Review*. Report prepared for the Northern Territory Government. Accessed 14 June 2018

Ricardo-AEA. 2014. *Cost Benefit Analysis of Bags for Life Charges in Wales.* Welsh Government.

Schmidt C, Krauth T, Wagner S. 2017. Export of plastic debris by rivers into the sea. *Environmental Science & Technology 51*(21): 12246-12253.

Steffen W, Richardson K, Rockström J and 15 others. 2015. Planetary Boundaries: Guiding human development on a changing planet. *Science* 347(6223).

Tanaka K, Takada H, Yamashita R, Mizukawa K, Fukuwaka M, Watanuki Y. 2013. Accumulation of plastic-derived chemicals in tissues of seabirds ingesting marine plastics. *Marine Pollution Bulletin* 69(1-2): 219–222.

The Allen Consulting Group. 2006. *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*. Report to the Environment Protection and Heritage Council.

The Danish Ecological Council. nd. *Fact sheet: Tax on Plastic Bags*.

Thomas GO, Poortinga G, Sautkina E. 2016. *The Welsh Single-use Carrier Bag Charge and Behavioural Spillover.*

Tough R. 2007. *Plastic Shopping Bags: Environmental Impacts and Policy Options*. A thesis submitted to Victoria University of Wellington as partial fulfilment for the degree of Master of Environmental Studies. Wellington: Victoria University.

UK Environment Agency. 2011. *Life Cycle Assessment of Supermarket Carrier Bags: A Review of the Bags Available 2006*.

UNEP. 2018. *Single-use Plastics: A Roadmap for Sustainability.* United Nations Environment Programme: Nairobi.

WasteNot Consulting. 2015. *National Litter Survey 2014–15.* Auckland: The Packaging Forum's Public Place Recycling Scheme.

Waters A. 2015. *Environmental Effects of the Single Use Bag Ordinance in Austin, Texas*. Prepared for the Austin Resource Recovery and the Zero Waste Advisory Commission.

Welsh Government. 2016. *Single-use carrier bags.* Accessed 2 May 2018.

Wilcox C, Mallos NJ, Rodriguez A, Hardesty BD. 2016. Using expert elicitation to estimate the impacts of plastic pollution on marine wildlife. Marine Policy 65: 107–114.

World Economic Forum. 2016. *The New Plastics Economy: Rethinking the role of plastics – Industry agenda.* Geneva: World Economic Forum.

WRAP. nd. *UK Voluntary Carrier Bag Agreement - 2014 Data Governments, Retailers and the BRC*.

Zhu, Qunfang. 2010. An Appraisal and Analysis of the Law of "Plastic-Bag Ban". *Energy Procedia*, 5: 2516–2521.