EPHC

Consultation
Regulatory Impact Statement (RIS)
Investigation of options to reduce the environmental impact of plastic bags

January 2007

Environment Protection and Heritage Council

Invitation to comment

Your Views are Important and you are invited to make a submission

Making a Submission

EPHC encourages you to make your views on this draft (or consultation) Regulatory Impact Statement known, and to make available any information that you consider pertinent to the process. Your input will ultimately ensure that when EPHC makes a decision, that decision can be made on the basis of the best possible information available.

Written submissions on the discussion paper should be sent to:

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The closing date for submissions is **Monday, 26 February 2006**

All submissions are public documents unless clearly marked "confidential" and may be made available to other interested parties, subject to Freedom of Information Act provisions.

Form of Submission

An electronic form for lodging comments is available. The form can be emailed to you by the NEPC Service Corporation or downloaded from the EPHC website <www.ephc.gov.au>. This form can be filled out and submitted electronically. Consideration of your submission will be facilitated if it is provided, in this format.

Should you wish to provide your comments in another format, submissions may be made:

- in hardcopy;
- on a 3.5 inch floppy disk; or
- emailed to mgilbey@ephc.gov.au.

To facilitate submission analysis, electronic copies of documents are preferred in Microsoft Word format. If you are submitting your document as an Adobe Acrobat Portable Document Format (PDF), please ensure that the text can be copied from the document. If the text in the PDF document cannot be selected (e.g. it has been scanned as a picture), then the NEPC Service Corporation may request a Microsoft Word version.

To allow ease of photocopying, hardcopy submissions should be unbound.

Contents

Acronyms

ACCC	Australian Competition and Consumer Commission
ACG	the Allen Consulting Group
ADF	advance disposal fee
ALGA	Australian Local Government Association
ANRA	Australian National Retailers Association
ARA	Australian Retailers Association
ARA code	*Australian Retailers Association code of practice for the management of plastic shopping bags, 2003–05*
COAG	Council of Australian Governments
DEH	Department of the Environment and Heritage
EPHC	Environment Protection and Heritage Council
GDP	gross domestic product
HDPE	high-density polyethylene
KESAB	Keep South Australia Beautiful
LDPE	low-density polyethylene
MP	Member of Parliament
MRA	*Mutual Recognition Act 1992 (Cth)*
MRC	mandatory retailer charge
MRFs	Materials Recovery Facilities
NEPM	National Environment Protection Measure

NGOs	non-government organisations
NPCC	National Packaging Covenant Council
NPV	net present value (see glossary for explanation)
NSW	New South Wales
RIS	Regulatory Impact Statement

Glossary

advance disposal fee	A fee levied on specified products to pay for the end of life/use collection of the products for reuse, recycling or treatment for safe disposal
amenity	The quality of being pleasant or agreeable pertaining to places (adapted from the Oxford English Dictionary)
brand owner	In relation to plastic bags, the importer or manufacturer of the plastic bag or the retailer who provides the plastic bag to the consumer for the transportation of products purchased by the consumer at the point of sale
Clean Up Australia	National non-profit organisation
co-regulatory arrangement	A combination of voluntary industry-led initiatives and government regulation
the covenant	National Packaging Covenant
degradable plastic	Plastics able to be broken down by mechanisms such as bacterial action, exposure to heat, light or oxygen within a short timeframe
exempt bags	Bags which comply with prescribed criteria are deemed exempt and are not targeted by potential voluntary or regulatory action to reduce plastic bag litter . For example exempt bags could include bags used for health and safety reasons and heavy duty reusable polymer bags, such as 'green bags'.
externality	A side effect or consequence which affects other parties without being reflected in the cost of the goods or services involved (Oxford English Dictionary)
free rider	An individual, company or organisation that obtains benefits without paying a corresponding share of the costs of obtaining those benefits
Group One retailers	Includes the major and smaller supermarket chains and independent supermarkets sponsored by wholesalers or run under banner groups, which are signatories to the *Australian Retailers Association code of conduct for the management of plastic bags*

Group Two retailers	All other retailers using lightweight HDPE bags and that are signatories to the *Australian Retailers Association code of conduct for the management of plastic bags*
Keep Australian Beautiful	Not-for profit organisation.
MMRF-Green	MMRF-Green (Monash Multi-Regional Forecasting-Green) is an economic model used for modelling changes to the Australian economy caused by 'external shocks' such as price increases, taxation changes, and demand and supply changes. Technically it is a multi-regional, dynamic computable general equilibrium (CGE) model.
National Environment Protection Measure (NEPM)	A NEPM is a broad, framework-setting, statutory instrument defined in the *National Environment Protection Council Act 1994*. NEPMs outline agreed national objectives for protecting or managing particular aspects of the environment. They are similar to environmental protection policies in some state legislation. NEPMs may consist of any combination of goals, standards, protocols, and guidelines. Typically, a NEPM may contain a goal; one or more standards; one or more monitoring and reporting protocols; and may also contain guidelines. NEPMs must relate to ambient air quality; ambient marine, estuarine and fresh water quality; the protection of amenity in relation to noise; general guidelines for the assessment of site contamination; environmental impacts associated with hazardous wastes; the re-use and recycling of used materials; and motor vehicle noise and emissions.
National Environment Protection (Used Packaging Materials) Measure	The National Environment Protection (Used Packaging Materials) Measure is designed to deal with free riders and non-signatories who significantly contribute to the packaging waste stream, and is applied at the jurisdictional level through state-based regulation.
National Packaging Covenant	The National Packaging Covenant is a voluntary agreement between parties in all parts of the packaging supply chain, based on the principle of shared responsibility.
National Packaging Covenant Council	The Council has overall responsibility for the implementation and management of the covenant. Membership of the council includes representatives from state and territory environment departments, local government, and industry.

net present value (NPV)	This is a standard method used to plan long-term investments. Using the NPV method, a potential investment project should be undertaken if the present value of all cash inflows minus the present value of all cash outflows (which equals the net present value) is greater than zero. Net present value can be calculated by the following formula, where 't' is the amount of time (usually in years) that cash has been invested in the project; 'N' is the total length of the project; 'i' is the cost of capital; and 'C' is the cash flow at that point in time. $\mathrm{NPV} = \sum_{t=0}^{N} \frac{C_t}{(1+i)^t}$
plastic bag	The definition used in the cost benefit analysis is a single-use, lightweight, singlet-style, polymer carry bag that is provided or used by the retailer, at the point of sale, for carrying and transporting goods purchased by the consumer. A more comprehensive definition, which includes possible exemptions, is discussed in section 2.1.
resource efficiency	At the societal level, resource efficiency is about getting the best return for society out of all physical resources and materials used in the production and use cycle. Improvements in resource efficiency can have broad environmental and economic benefits. At a company level, resource efficiency is about maximising returns to the company. There are various ways companies can act to improve their resource efficiency such as reducing the amount of materials used, reducing manufacturing costs, reducing waste materials, and reducing costs of compliance with environmental legislation.
required unquantified benefits	Value of benefits that are required which had not been incorporated into the cost/benefit analysis, to balance the costs. For example the social value of an action.

1. Executive summary

This consultation Regulatory Impact Statement (RIS) has been prepared for the Environment Protection and Heritage Council (EPHC) by a multi-jurisdictional working party. The consultation RIS evaluates options for potential voluntary, co-regulatory, and regulatory action to reduce the environmental impact of plastic bags. Its purpose is to inform any future policy decision on plastic bags. It is being used as part of the EPHC public consultation process relating to the management of plastic bag litter, and it outlines government and industry action to date and discusses the implications of possible future intervention. In 2007, EPHC Ministers will consider whether nationally-coordinated government action is required to reduce the impact of plastic bags.

Plastic bags pervade Australian society and like many other forms of packaging, are prone to becoming litter. Despite being only a small percentage of all litter, their visibility, persistence and ease of dispersal make them a highly visible component of the litter stream. The cost of cleaning up this litter can be significant for public entities (state and local government), companies, and not-for-profit organisations in terms of money, labour costs, and volunteer hours. Costs are also associated with education and awareness campaigns and the provision of infrastructure to discourage the litter.

A number of measures are in place which are helping to reduce the impact of plastic bags on the environment. These include anti-litter regulations, the National Packaging Covenant, and voluntary mechanisms (such as Victoria's Plastic Bag Free Challenge; the Australian Government's small business initiative; and bag reduction efforts by some retailers). In spite of these measures, plastic bags continue to impact on the environment.

In June 2006, EPHC reaffirmed its conclusion that lightweight, single use plastic bags should be phased out by the end of 2008. As a consequence, EPHC requested advice on regulatory and other scenarios that might achieve the objective of reducing the impact of plastic bags on the environment, including nationally consistent regulatory scenarios of a ban, a mandatory retailer's charge, an advanced disposal fee and a government levy. Specifically, the objective of government action, if deemed necessary, would be to address the negative impact of plastic bag litter on the community and the Australian environment. Action would address the externalities caused by the impact of using plastic carry bags, which are currently not borne directly by those responsible for creating the plastic bag litter. These externalities include:

- the impact of plastic bag litter on amenity
- the impact of plastic bag litter on wildlife
- the costs created by plastic bag litter in waste management.

This consultation RIS considers fifteen alternatives for possible action on plastic bags. The options are addressed in two main groups: one group looks at options which focus on litter-based activities; and the other group looks at options which target the consumption of plastic bags at the point of sale. The consultation RIS draws on economic data and analysis prepared by the Allen Consulting Group (ACG) in two reports, *Phasing out light-weight plastic bags: costs and benefits of alternative approaches* and *The ANRA proposal on plastic bag management: supplementary economic analysis to the EPHC report*. The ACG reports are companion documents to this RIS.

Litter Focused Options

- Option A: Enforcement
- Option B: Behaviour Change
- Option C: Litter Clean Up
- Option D: Litter infrastructure
- Option E: Advance disposal fee (*ACG scenario 7)*

No further government action

- Option F: baseline scenario *(ACG scenario 2)*

Plastic Bag Consumption Focused Options

- Option G: extension of ARA code of practice beyond 1 January 2006 (*ACG scenario 3)*
- Option H: industry agreement to impose a gradually escalated charge, supported by government co-regulation measures such as a NEPM (*ACG scenario 4)*
- Option I: industry agreement to phase out plastic bags in the short term, followed by government regulation to phase out remaining bags from 2009 (*ACG scenario 5)*
- Option J: retailers obliged by regulation to impose a minimum charge for plastic bags; retailers retain revenue from charge (*ACG scenario 8)*
- Option K: government imposes levy on plastic bags (*ACG scenario 9)*
- Option L: elimination (ban) of plastic bags by government regulation on 1 January 2009 (*ACG scenario 1)*
- Option M: elimination of plastic bags by government regulation prior to 1 January 2009 (*ACG scenario 6)*
- Option N: a voluntary commitment by retailers to carry on education and other activities from the 2003–05 ARA code of practice, with a target of reducing plastic bag use by 50 percent by the end of 2006, with further reductions depending on the availability of environmentally sustainable alternative carry bags (the ANRA proposal) (*ACG supplementary scenarios 1a and 1b)*
- Option O: as for Option N but with additional targets of a 10 percent year-on-year reduction in plastic bag use after 2006 (*ACG supplementary scenarios 2a and 2b*).

ACG notes some key characteristics that can act as navigation points for the development of an efficient and effective policy for reducing the environmentally adverse and socially undesirable implications of plastic bags. These are:

- the 'free' status of plastic bags, as opposed to for example, charging 25 cents, generates no monetary incentive for consumers to reduce their use of them
- consumption of plastic bags falls off significantly at modest prices, ACG assumed consumption to drop to almost zero with a charge of 25 cents
- reusable bags are a highly cost-effective alternative to plastic bags, but consumers cannot directly pocket this benefit if they cannot opt out of paying for plastic bags because the plastic bag costs continues to be spread across all groceries and other goods
- consumers will continue to face circumstances where a plastic bag is an efficient option for their carrying needs (for example, to carry refrigerated products, for impulse purchases, etc.)
- environmental benefits flow from reductions in littered bags.

ACG argues that, based on these findings, a price-based approach is likely to be considerably more cost effective than a ban in circumstances where it allows for residual bag use, as a price signal can be used to drive a significant reduction in bag consumption but allows those consumers who put a high value on plastic bags to continue to access them.

The costs and benefits of the initial hypothetical scenarios are indicated in the following table.

Table 1: Summary of economic and environmental costs and benefits per Option[1]
(scenarios compared against 'no further government action')

Option	Costs (PV, $m)	Benefits (PV, $m)	Sum of costs and benefits	Litter reduction (millions)
(A) Enforcement[2]	-	-	-	-
(B) Behaviour Change	-	-	-	-
(C) Litter Clean Up	-	-	-	-
(D) Litter Infrastructure	-	-	-	-
(E) advanced disposal fee (cost recovery)	-$767.9	$181.5	-$586.47	300.5
(F) Baseline option	baseline			
(G) Extend ARA code	-$646.0	$156.3	-$489.67	233.2
(H) Escalated charge	-$1 293.1	$266.3	-$1026.80	418.4
(I) Voluntary phase-out to 2009; mandatory beyond after 2009	-$1 093.5	$270.6	-$822.87	422.4
(J) Regulated price (kept by retailers)	-$1 035.1	$217.8	-$817.34	360.6
(K) Levy on plastic bags	-$900.0	$188.7	-$711.29	312.5
(L) Eliminate plastic bags by 2009	-$1 057.1	$217.8	-$839.30	360.6
(M) Out-right ban prior to 2009			-$ 944.20	
(Na) ANRA proposal	-$562	$170	-$392	111
(Nb) ANRA proposal	-$430	$154	-$276	102
(Oa) ANRA proposal with added targets.	-$799	$93	-$706	-148
(Ob) ANRA proposal with added targets	-$646	$156	$450	134

Based on the analytical work by ACG, it appears that there is no one option that can be described as the 'best' option. Indeed, based on this economic analysis, the economic and environmental costs of the options considered outweigh the potential economic and environmental benefits by a substantial margin.

Major retailers and their representatives have indicated that they do not support a voluntary phase-out agreement as projected in Option I. Extending the ARA code in its current form, as

[1]Allen Consulting Group Report May 2006 p. 39 (*Phasing Out Light-Weight Plastic Bags; Costs and benefits of alternative approaches*). Table modified from the Allen Consulting Group, *The ANRA Proposal on Plastic Bag Management: supplementary economic analysis to the EPHC Report*, June 2006, p. 19.
[2] Options A – D are discussed in more detail in Section 6. Costs have not yet been obtained for these options however are presented in the consultation RIS to invite comment on the approaches.

analysed in Option G, is an option that is likely to be unacceptable to both governments and industry. Given the voluntary nature of retailer activities under these options, lack of agreement by both retailers and government would effectively eliminate these two options. In May 2006, the proposal put forward by ANRA took the focus as the main voluntary proposal coming from the retail sector.

If however, the value of the non quantified benefits such as the social benefit of phasing out plastic bags is determined to be sufficient to justify regulatory action, a mandatory charge or a ban on plastic bags implemented at state level in a nationally consistent manner, appear to be the regulatory options that are most appropriate. These options provide mechanisms that can be implemented with less administrative complexity than others. They can also provide substantial reductions in plastic bag distribution and hence litter.

2. Introduction

The consultation RIS should be read in conjunction with the associated cost benefit reports prepared by the Allen Consulting Group *Phasing out light-weight plastic bags, costs and benefits of alternative approaches* and the *ANRA Proposal on plastic bag management, supplementary economic analysis to the EPHC report.* This document investigates the options for reducing the environmental impact of plastic bags. It is intended to be used as part of the public consultation process for developing national policy to manage plastic bags. It outlines government action to date, and possible future government and industry intervention.

Early History of Plastic Bag Policy Development

The impact of lightweight plastic carry bags on the environment has been a matter of consideration for the Environment Protection and Heritage Council (EPHC) and has been consistently highlighted in the media as a significant community issue. In October 2002 Australian Environment Ministers, meeting as EPHC, established a stakeholder working group to report through the National Packaging Covenant Council. The purpose of this working group was to consider the different facets of the plastic bag problem, to inform the public debate and provide a range of options for addressing the impacts of plastic bags. The Plastic Bag Working Group consisted of stakeholders from a wide range of sectors including federal, state and territory governments, various industry sectors including recyclers, retailers, and environment groups. Consistent with Council of Australian Governments principles, membership of the working group was deliberately chosen to ensure a broad coverage of stakeholders views. The report produced by the working group, *Plastic Shopping Bags in Australia*[3] recommended to the National Packaging Covenant and the EPHC, a raft of actions which has informed decision making by industry and government since that time and initiated a multifaceted approach to deal with the environmental impact of plastic bags.

For example, in 2003 the EPHC requested a suite of standards for degradable plastics to be developed. This work involves close collaboration between governments, retailers and industry to develop degradable standards, such as assessing the compostability and anaerobic degradation of biodegradable plastics. Furthermore, in line with recommendations from the working group report, in 2005 EPHC produced landfill guidelines and public place litter guidelines as part of its plastic bag activities. The Working Group also recommended the adoption and implementation of a *National Code of Practice for Management of Plastic Retail Carry Bags* which was implemented from 2002-05.

Some of the other working group recommendations have expanded as more information was gathered on plastic bags. For example, the current Regulatory Impact Statement considers impact assessments for more options than that originally recommended in the working group paper and, at the request of EPHC, consider several mandatory options for reducing the impact of plastic bag litter for a more comprehensive approach. The Working Group report is available from the EPHC website, www.ephc.gov.au

[3] National Packaging Covenant Council *Plastic Shopping Bags in Australia* National Plastic Bags Working Group Report to the National Packaging Covenant Council December 2002. http://www.ephc.gov.au/ephc/plastic_bags.html

2.1. Definition of 'plastic bag'

The definition of a plastic bag needs to be broad enough to ensure that all problematic lightweight plastic bags are addressed by any legislation but not so broad as to include bags that do not have obvious detrimental environmental impacts. The definition must also not be so narrow that with a small change in manufacturing, bags can be moved outside the scope of the legislation resulting in one type of bag being substituted for another with no environmental benefit. This could simply lead to an inefficient outcome where lightweight plastic bag litter is substituted with slightly heavier plastic bag litter.

The cost/benefit reports referenced in this consultation RIS use the term 'light weight plastic bag' and *inter alia* draw on figures from a Nolan ITU 2002 report which defined plastic bags as 'polymer carry bags provided or utilised at retail point of sale for carrying and transporting retail goods'.[4] However this RIS seeks comments on a proposed definition which includes possible exemptions. Further cost/benefit analysis may be required to account for the impact of exemptions in any regulatory option.

The proposed definition is:

> *A plastic bag means a carry bag, the body of which comprises polymers in whole or part, provided by the retailer for the carrying or transporting of goods, but does not include a carry bag which complies with prescribed design criteria.*

Bags that comply with prescribed design criteria would be 'exempt bags'. Such bags could include bags used for health and safety reasons to prevent food cross-contamination. Exemptions for heavier duty reusable polymer bags, such as 'green bags', would be allowed. While biodegradable bags would not be exempt from proposed regulation currently, if they were to meet appropriate Australian Standards and governments were convinced that their use would decrease the environmental impacts associated with plastic bag litter, they could be exempt in the future. Small businesses are not excluded from this definition at this time.

[4] Nolan ITU *Plastic Shopping Bags - Analysis of Levies and Environmental Impacts* 2002 p.1.

Update on Degradable Plastic Standards

The term degradable encompasses several types of the plastics, including biodegradable and oxo-degradable resin. Degradable plastic bags may prove to be a viable substitute for HDPE plastic bags. However to do so, manufacturers must be able to demonstrate that their products are environmentally acceptable, with any claims and labeling backed up by sound science. Such products will need to meet the Australian Standards for degradable plastics currently being developed by Standards Australia.

To date, Standards Australia has finalised a suite of standards to cover the breakdown of biodegradable plastic under commercial composting conditions:

- AS 14852-2005 - *Plastic materials - Determination of the ultimate aerobic biodegradability in an aqueous medium - Method by analysis of evolved carbon dioxide*
- AS 14855-2005 - *Plastic materials - Determination of the ultimate aerobic biodegradability and disintegration under controlled composting conditions - Method by analysis of evolved carbon dioxide*
- AS 4736-2006 - *Biodegradable plastics - biodegradable plastics suitable for composting and other microbial treatment compostability*

These are available for purchase from Standards Australia http://www.standards.com.au/

Before the full suite of standards can be developed for a range of other end environments (soil or in water etc), significant information gaps need to be filled, particularly for materials based on prodegradant technologies. These include how quickly and under what environmental conditions they breakdown; the potential human and environmental toxicity of the prodegradant additives; the nature of any residues left behind after they have been degraded; and the impact they may have on bag recycling.

It is important to note that the three standards mentioned above relate to degradability in commercial compost. Plastic bags, as shown in Figure 2 on page 27, find their way into a range of different environments where conditions are significantly different from the controlled conditions of a commercial operation. Standards development work has recently been undertaken in Europe and North America on plastic degradability in home composting, soil, fresh water, marine water and other materials incorporated within a degradable product. These standards will be examined by the Australian Standards Technical Committee for possible adaptation and adoption as Australian Standards.

Complementary to the standards work, the Plastics and Chemicals Industries Association, with support from the Australian Government, is developing a voluntary product stewardship Commitment and

The definition presented in this consultation RIS, focuses on the purpose for which the bag will be used rather than the weight, dimensions, style or chemical composition of the bag. A definition based on these physical attributes could enable plastic bag providers to avoid complying with any potential voluntary or regulatory action by using plastic bags that fall just outside the designated range. For example if a definition targeted plastic bags that weigh 6g and under, plastic bag providers could avoid compliance by using plastic bags that weigh 6.1g. A definition based on physical characteristics is more prone to 'loop holes', which could compromise any action to reduce plastic bag litter in a nationally consistent approach.

Also on the matter of weight, research undertaken by the Royal Melbourne Institute of Technology shows that the thickness and weight of a plastic bag does not impact on the ease with which it may

become litter if placed in a waste receptacle and dispersed by the wind[5]. Consequently it cannot be reasonably used as a basis for defining those plastic bags that should be subject to regulatory action that is aimed at reducing plastic bag litter. This is discussed further under section 3.3.

Exemptions would need to be defined in regulations if a legislative option were pursued. Possible exemptions could include plastic bags that are used for:

- containing raw produce, including fruit, nuts and vegetables; or
- packaged raw fish and raw fish products; or
- packaged raw meat and raw meat products; or
- packaged raw poultry and raw poultry products; or
- ready to eat food whether hot or cold; or
- frozen or refrigerated products, or any other product that may leak liquid or create condensation; or
- household and garden chemicals.

While bin liners or 'bags on a roll' are not included in the above list of exemptions neither type of bag is provided at point of sale to transport goods and neither type is considered to be a plastic bag. Both types of bag are therefore outside of the scope of the current policy discussions.

Questions for consultation

- **How would these exemptions impact on retailer processes?**
- **Are all these exemptions necessary?**
- **Are other exemptions necessary?**
- **Should degradable plastic be exempt and if so, why?**
- **Are there any other issues that need to be considered in defining plastic bags?**

2.2. Plastic bags in Australia

Plastic bags are popular with consumers and retailers because they provide a convenient, highly functional, lightweight, strong, cheap, and hygienic way to transport food and other products. Plastic bags are commonly provided directly at the point of purchase, with no transparent charge. The consumer does not have to remember to take other shopping bags with them. Plastic bags are time-efficient at the check-out compared with alternatives which lead to increases transaction times.[6] Plastic bags are also used for secondary purposes such as bin liners and barrier bags (for transporting wet swimmers, shoes etc). The widespread use of plastic bags has meant that they are ubiquitous in society and have the potential to be littered in numerous ways, therefore their impact as litter needs to be considered.

In Australia, the predominant types of plastics used for plastic bags are high-density polyethylene (HDPE) and low-density polyethylene (LDPE). The HDPE 'singlet' bag is usually (but not always) a non-branded bag, used mainly in supermarkets, take-away food and fresh-produce outlets, but also in smaller retail outlets such as service stations and newsagents. The LDPE boutique-style

[5] Verghese, K. *Study of factors contributing to dispersal of littered plastic shopping bags* RMIT June 2006
[6] Allen Consulting Group, *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches, May 2006 p viii*

bags are generally branded and are used by stores selling higher value goods, such as department stores, clothing and shoe outlets.

In 2002, the consumption of plastic bags in Australia was estimated to be 6.9 billion bags (6.0 billion were lightweight, HDPE, singlet-style bags and 0.9 billion were LDPE bags), 50–80 million of which were estimated to end up in the litter stream; 30–50 million as a result of direct littering action, and the remaining 20–30 million as a result of inadvertent littering.[7] In 2005, plastic bag consumption had reduced to approximately 3.92 billion HDPE singlet carry-bags.[8]

Table 2.1: Consumption of plastic bags 2002-2005[9]

Retail Sector	Bag Consumption (billions)	
	2002	2005
Supermarket	3.64	2.14
Other retailers	2.31	1.78
Total	**5.95**	**3.92**

Awareness raising measures by government and non-government agencies (such as the ARA code, the Western Australian Bag Smart[10] initiative, and national activities by Clean Up Australia and Planet Ark) have contributed to heightened community concern over the number of plastic bags used and causing litter in Australia. This concern has led many consumers to choose reusable bags, as reflected in recent falls in bag use and increased sales of alternatives such as polypropylene 'green' bags.

Questions for consultation:

- **Do you have any quantitative data on the relative benefits and impacts of reusable bags when compared to plastic bags?**
- **Do you have any quantitative data that looks at the environmental impacts of varieties of reusable bags?**

Plastic bags are lightweight and have a tendency to 'balloon' in the wind, resulting in dispersal over large areas. Persistent plastic bag litter has been identified both internationally and in Australia as contributing to a number of environmental problems, including entanglement, suffocation and ingestion causing adverse impacts on fauna, and 'blanketing' causing impacts on flora.[11] Once in the environment, plastic bags can remain for many decades before breaking down.

[7] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* p. 9. Note that Allen Consulting Group have derived a figure of 40-60 million bags entering the litter stream in 2002, based on Nolan's original inputs.

[8] Hyder Consulting *Plastic Retail Carry Bag Use; Consumption 2002-2005* May 2006 p 6

[9] Hyder Consulating *Plastic Retail Carry Bag Use, Consumption 2002-2005* May 2006 p 1

[10] For more information on the ARA code see section 5.3. For more information on Bag smart, see http://www.bagsmart.com.au/ (accessed 19 November 2006)

[11] See for example L. Bugoni et al, 'Marine Debris and Human Impacts on Sea Turtles in Southern Brazil', *Marine Pollution Bulletin*, vol 42, No. 12, pp.1330-1334, 2001; Seminoff et al, 'Diet of East Pacific Green Turtles (*Chelonia mydas*) in the Central Gulf of California, Mexico', *Journal of Herpetology*, Vol 36, No. 3, pp. 447-453, 2002; Shoham-Frider et al, 'Risso's dolphin (*Grampus griseus*) stranding on the coast of Israel (eastern Mediterranean). Autopsy results and trace metal concentrations', *Science of the Total Environment*, 295 (2002), pp. 157-166; Williams, S., 'Rare turtle ill and lost at sea – fears it swallowed a plastic bag', *Daily Telegraph*, 25/2/06

3. Statement of the problem

Plastic bags pervade Australian society. Plastic bags are designed to be used once and then disposed. In 2002, EPHC found that, although plastic bags made up between approximately one and two percent of the litter stream, the estimated number amounted to many millions[12] and had a negative impact on the environment, including aquatic life and the loss of visual amenity. For example, nearly half a million plastic bags are collected on Clean Up Australia Day each year.[13] Once in the litter stream, plastic bags can take many decades to breakdown. This compounds the potential impact of each plastic bag that enters the litter stream, and results in a unique litter problem.

While litter is identified as the key issue relating to plastic bags, other environmental issues related to plastic bags such as wasteful consumption and resource use, have been identified by some people. These issues have not been a focus of this consultation RIS, however it is noted that the community sees plastic bag consumption as a symbol of wasteful consumption in society despite the fact that many consumers automatically use plastic bags. This automatic acceptance of freely distributed plastic bags works against the effectiveness of voluntary or regulatory actions, in that this behaviour is difficult to change.

It should be noted that the magnitude of the problem is difficult to quantify as data on numbers of plastic bags littered and the impact of this litter directly on animals and plants is difficult to obtain.[14] Laist confirms this view that in general, the impact of marine debris (which includes plastic bags) on marine animals through entanglement is difficult to determine, with entangled animals found on shore under representing the actual number of animals caught in debris.[15] Plastic bag litter can have a negative environmental impact. To counter uncertainty, a range of sources and estimates are used later in this consultation RIS to assess the potential magnitude of the problem and the costs of possible action.

3.1. Plastic bag consumption in Australia

In 2002 the consumption of plastic bags was estimated to be 6.9 billion bags (6.0 billion were lightweight, HDPE, singlet-style bags and 0.9 billion were LDPE bags), 50–80 million of these bags were estimated to end up in the litter stream – 30 to 50 million as a result of direct littering action, and the remaining 20–30 million as a result of inadvertent littering.[16] The majority of these bags – an estimated 6.67 billion or 36,700 tonnes – ended up in landfill. This was approximately 96 percent of all plastic bags supplied and included those bags re-used after the consumer had first used them to transport goods purchased from the retailer. Approximately 180 million bags or 100 tonnes were recycled, with around 50 tonnes being reprocessed in Australia.

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[12] See Figure 1 on page 23

[13] Australian Bureau of Statistics – Australia's Environment: Issues and Trends 2006 p 24

[14] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p. 30. the difficulty to determine numbers of animals deaths by entanglement in marine debris is noted in Laist 1997 *Marine Debris Entanglement and Ingestion* p101. .

[15] Laist 1997 *Impacts of Marine Debris: Marine Debris Entanglement and Ingestion* p101. Note in this article marine debris includes *inter alia* plastic bags p103

[16] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p. 9. Note that Allen Consulting Group have derived a figure of 40-60 million bags entering the litter stream in 2002, based on Nolan's original inputs.

Litter Estimate

It is difficult to measure the total number of bags that enter the litter stream each year. Nolan ITU attempted to do this in 2002 but in doing so cautioned against using such figures for measuring performance against related targets. This important qualification should always be considered when using those data.

- Does the 2002 estimate seem reasonable from your experience and observations, please detail your response with data where possible?
- Can you improve the rigour of this annual plastic bag litter estimate, detailing the method used to arrive at your estimate?

In 2005, plastic bag consumption had fallen to an estimated 3.92 billion plastic bags. This equates to an average use of 192 bags per capita in 2005 down from 303 per capita in 2002 and an overall reduction in plastic bag consumption of 34 percent from 2002 levels.[17]

As the focus of recent bag reduction activities has been on HDPE bags, less data are available on LDPE bag usage. However in 2006, Hyder Consulting noted that LDPE bag imports in 2005 were 69 percent lower than in 2002.[18] It appears that this did not reflect a shift to local production of these bags, but was more attributable to a decline in their use.

As demonstrated by Figure 1, various types of retailers are responsible for the distribution of plastic bags.[19] In 2002, supermarkets accounted for 53 percent of plastic bag distribution with the other 47 percent distributed by other retailers, such as fast-food, hardware, newsagents, gift shops, and other general merchandising outlets.

It has been estimated that in 2005, Australian manufacturing of HDPE plastic bags had fallen by 51 percent since 2002. The following table indicates a reduction in Australian plastic bag manufacturing from 2002 to 2005.

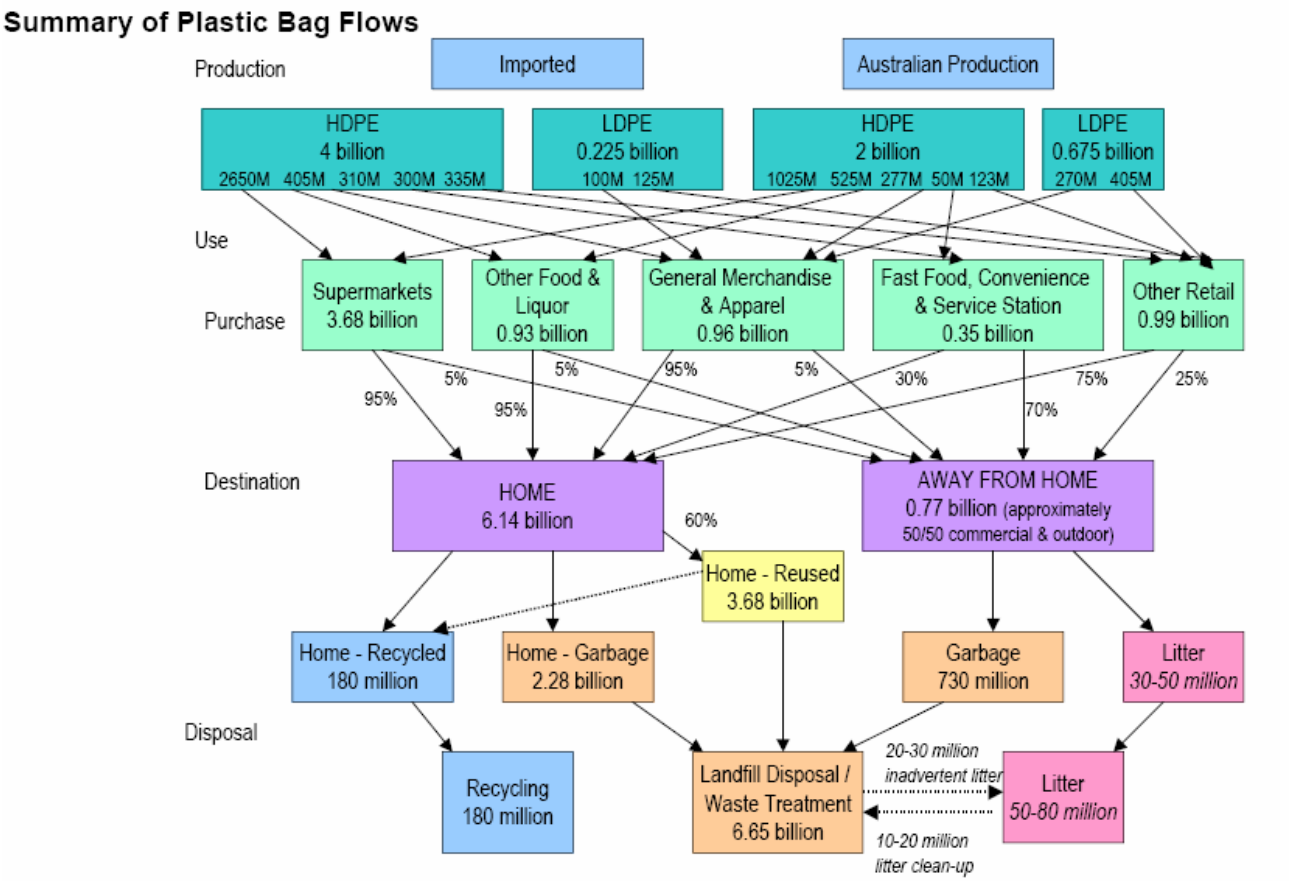
Table 3.1 Reduction in Australian Plastic Bag Manufacturing Since 2002[20]

	2002	2003	2004	2005
Locally produced HDPE bags (billions)	1.98	1.75	1.58	0.97

Of the 3.92 billion HDPE single-use bags supplied in 2005, 25 percent (0.97 billion bags) were locally manufactured and the remainder were imported[21] There are two main plastic bag manufacturers in Australia – Detmark Poly Bags Pty Ltd and Andrew Kohn Pty Ltd – both of which are located in Victoria.

[17] Hyder Consulting, May 2006, *Plastic Retail Carry Bag Use 2002-2005 Consumption: 2005 end of year report*, p.6-7.
[18] Ibid.
[19] Nolan-ITU, 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p9
[20] Table adapted from Hyder May 2006 p6.
[21] Hyder Consulting, Op. Cit, p.6

Figure 1: Summary of plastic bag flows



Source: Nolan-ITU, *Plastic shopping bags – analysis of levies and environmental impacts*, 2002

Despite recent plastic bag reductions by major supermarkets under the ARA code, and various national and state government public awareness campaigns, the number of HDPE bags being issued is still likely to be just under 4 billion a year, and as a consequence, the potential number of bags impacting on the environment as litter may be approximately 1 percent of this or in other words 40 million.

Calculating the number of bags that end up in the litter stream is complex and depends on the definitions and methodologies used. The economic modelling provided by Allen Consulting Group is based on a estimate of 40–60 million bags being littered in 2002, using inputs provided by Nolan-ITU. This differs from Nolan-ITU's estimated aggregate of 50–80 million bags in 2002

Since 2003, most efforts have focused on HDPE singlet-style bags, as these represent by far the most popular style of plastic carry bag used in Australia. Future action, however, may be necessary in relation to other lightweight polymer bags (such as LDPE) to avoid simple substitution of one type of bag for another.

Questions for consultation

- **Can you provide quantitative data about the level of plastic bag litter that is not considered here?**

3.2. Nature of the plastic bag transaction

The value that some consumers place on the plastic bag varies with context. Some consumers may value plastic bags in a retail context when they are purchasing goods that need to be carried. However, after the bag has served its original purpose, they view the bags as an undesirable item that impinges on their expectation of having a clean and healthy environment, unaffected by plastic bag litter.

There is a relationship between consumption of plastic bags and the incidence of litter. As noted, above, about one to two percent of plastic bags enter the litter stream. The price the consumer faces for plastic bags will impact on their use and re-use, the use of alternatives, and the value people attribute to the bag after its initial use. Each of these factors can influence the number of plastic bags in the litter stream. For example in Ireland, a tax on plastic bags resulted in a reduction in plastic bag litter (see section 3.4).

Plastic bags are not an integral packaging item and are generally provided to consumers without a transparent charge. Plastic bags are a type of packaging that is not necessarily essential to the integrity of the product purchased. By way of comparison, packaging of most consumer goods is embodied in the cost of the item, where the type of packaging is important for the consumer to be able to buy and preserve the integrity of the item. The consumer, for example, does not distinguish between the milk and the carton, considering them to be one item and with the carton included as part of the overall cost. Product packaging, such as a milk carton, often fulfils the practical need of protecting the integrity of the product through the distribution process and the safety of consumers through preventing contamination and tampering.

Plastic bags, on the other hand generally appear to the consumer to be provided free of charge. The consumer may not usually be aware that the price of plastic bags is spread across the price of all goods on sale.[22] The ACG notes that these pricing arrangements provide no monetary incentive for consumers to reduce their use.[23] It has been reported that supplying plastic bags costs the retail industry over $173 million per year.[24] More importantly, customers who do not take a plastic bag and choose to use a reusable bag as an alternative, still share the cost of plastic bags used by others. A consumer who can opt out of paying for plastic bags by bringing their own bag to a retailer that charges explicitly for plastic bags (say 2 cents per bag) would save around $10-$15 a year.[25]

However as the cost of plastic bags is usually included across the price of all products, the consumer usually cannot take advantage of this saving. As ACG observes, 'customers who refuse plastic bags are not able to recoup this value' and at present only a small number of specialist retailers charge consumers a transparent charge for plastic bags – for example, Aldi Supermarkets (15 cents); Bunnings Warehouse (10 cents); and IKEA, (25 cents). Therefore this provides little monetary incentive to reduce bag use.[26]

If no explicit monetary value is placed on plastic bags, there may be a disconnect between the consumer's decision to use plastic bags and the external impacts and costs that result from this use. ACG notes that consumers that are most sensitive to a price on plastic bags include those that put

[22] ACG report May 2006 indicated that a plastic bag costs $0.03 p15
[23] ACG report May 2006 p xi
[24] Planet Ark, http://www.planetark.com/campaignspage.cfm/newsid/56/newsDate/7/story.htm
[25] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p. 4
[26] ACG report, p13 – chapter 1

the lowest value on the availability of a bag. ACG also notes that it is likely that a disproportionate share of deliberately littered bags come from this group of consumers.[27]

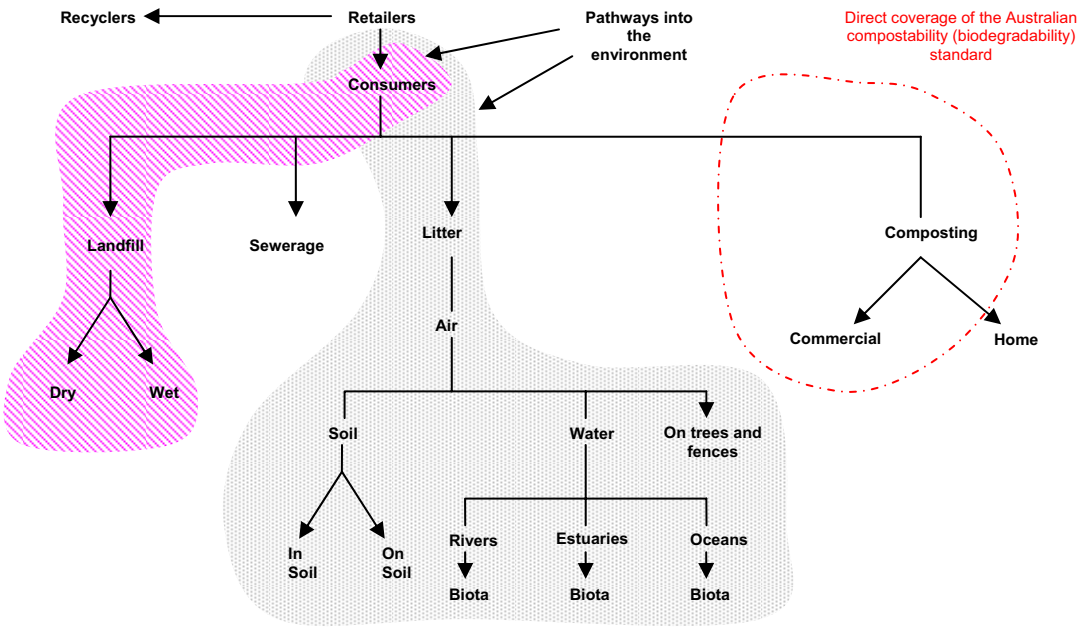
In addition, voluntary retailer strategies to encourage bag-use reductions result in consumers, who have voluntarily changed their shopping habits, subsidising the single-use bags used by other consumers. Reductions, if any, in the price of goods to account for the reduction in bags provided by supermarkets will have been passed to all consumers, regardless of whether they have reduced their personal use of bags. This provides little incentive for retailers to achieve efficient levels of plastic bag use.[28]

The majority of bag-use reductions under recent initiatives such as the ARA code have not been borne evenly by all retailers. Larger retailers have invested funds in education and consumer awareness programs and have thereby achieved greater reductions in usage.[29]

3.3. Plastic bags and litter

Plastic bags are introduced into the market place by retailers as part of normal commercial operations. Where the bags go after that depends on the choices made by consumers. As indicated earlier, the lion's share ends up in landfill (Figure 1, page 23) - but where do the remaining bags that are littered end up? Figure 2 identifies a range of environments where plastic bags may end up and illustrates the difficulties associated with introducing or implementing policies that specifically target plastic bag litter.

Figure 2: Possible end environments for plastic bags



Estimates of plastic bag litter vary. For example a Keep Australia Beautiful[30] estimate places it at less than one percent of all litter collected whereas a Clean Up Australia estimate indicates it to be

[27] ACG report May 2006 p 14.
[28] ibid
[29] The ACG Report May 2006 noted that compliance to the ARA code was approximately $21 million per annum p 56
[30] Keep Australia Beautiful National Litter Index 2005 and 2006

more than two percent[31]. Although numerically less significant than other litter types, plastic bags are a prominent component of the litter stream because of a combination of three elements:

- visibility
- persistence
- ease of dispersal.

Littered plastic bags are easily seen in the urban or natural environment because of their size, shape and colour. While the plastic material in the bag is designed to last the duration of its use, the bag may remain intact for many years. In the time it takes for one bag to breakdown, more bags could have accumulated in the same location, increasing the potential negative impact on the environment.

Owing to their low weight and ability to balloon in the wind, plastic bags and fragments can be dispersed by the slightest of breezes. Their resulting wide dispersal and lodgement in places difficult to access (tree branches, drain grills, fencing) makes cleaning up plastic-bag litter costly and time consuming. In addition, when they do breakdown, plastic bags leave fragments of varying sizes. Littered bags, and bag fragments, may end up in highly sensitive natural environments and have an impact on species that are already under stress.

In 2006, a study commissioned by the Department of the Environment and Heritage (DEH) tested eight designs and a number of plastic bag materials (including LDPE and HDPE) to determine whether any particular types were more prone to wide dispersal as litter. The study concluded that all the bag types tested were prone to being caught by the wind and dispersed long distances, that all bags were prone to inadvertent litter from bins and that the lighter bags tended to snag more easily than heavier bags. The study noted that bag design needed to be appropriate for its application.[32] As a result, there was no basis for favouring one type of non-degradable single use bag over another on the grounds that it would have lower litter impacts.

Questions for consultation

- **Where do you usually see littered plastic bags?**
- **Do you have quantifiable data on where and how many plastic bags are littered in your local area or nationally?**

3.4. Linkage between plastic bag consumption and litter

Logically a 100 percent reduction in plastic bag consumption would lead to a 100 percent reduction in new plastic bag litter. Strong bag use reduction policies like the one pursued in Ireland also reduce litter[33]. However, this change has not been permanent and increases in the charges have been required. The precise nature of the relationship between litter and bag use is not clear. Available data are not comprehensive enough to be able to identify at what point reducing plastic bag consumption impacts most on plastic bag litter. In Australia, voluntary efforts have seen significant reductions in plastic bag consumption, however these do not appear

[31] Clean Up Australia Rubbish Report 2002 and 2005

[32] K. Verghese et al, 'Study of factors contributing to dispersal of littered plastic shopping bags', RMIT University, June 2006, pp. 7-8

[33] http://www.scottish.parliament.uk/business/committees/environment/inquiries/pb/ERD.S2.05.27.1d%20-%20DEHLG.pdf (Accessed 16/11/06).

to have had a noticeable impact on litter with levels remaining approximately the same.[34] In Ireland, plastic bag litter levels were higher than Australian levels, around 5 percent of the litter stream,[35] and were reported to be reduced with a 90 percent reduction in plastic bag consumption[36] after the introduction of a tax on plastic bags.

The approach of reducing plastic bag consumption in order to reduce plastic bag litter has largely driven plastic bag policy in Australia since 2002. Reducing plastic bag consumption to decrease plastic bag litter has practical advantages over other approaches. While some action has been taken to directly address the litter issue, further action directed at litter abatement would require jurisdictions to target numerous littering mechanisms and litter entry points and this would be very difficult to implement. Therefore the majority of the options considered in Section 7 of this consultation RIS focus on the consumer receiving the plastic bag at point of sale as the target point for addressing the problem of plastic bag litter.

3.5. Sources of plastic bag litter: intentional and inadvertent littering

Plastic bags appear in the litter stream as a result of both inadvertent and intentional littering behaviour. Inadvertent litter is usually associated with plastic bags that are wind blown from sources such as bins, uncovered loads on moving vehicles, kerbside waste collection, transfer stations, material recovery facilities (MRFs), and landfill sites. In 2002, Nolan-ITU calculated that 20–30 million bags were inadvertently littered from waste management activities such as landfills and overflowing public bins, while 30–50 million bags were littered away from home (whether through inadvertent or intentional action).[37]

Intentional litter results from inappropriate disposal by consumers. People may leave bags on the ground whether or not suitable infrastructure (such as bins) is available. Regardless of the source of plastic bag litter (inadvertent or intentional), plastic bags that end up in outdoor settings are considered to have greater potential to become litter than plastic bags taken into the home and used for a secondary purpose such as kitchen garbage bags. The Nolan-ITU (2002) study found that the overwhelming majority of plastic bags ended up in landfill (96 percent) including those that were re-used.

3.6. Impacts and costs of plastic bag litter

The impacts of plastic bags in the litter stream are identified for the purposes of this consultation RIS as the principal environmental problem associated with plastic bags, although other impacts (such as consumer concern and resource inefficiency) are often noted in public discussion of the problem.

Plastic bag litter can accumulate in the environment. Once in the litter stream, plastic bags do not readily break down. There are various estimates of how long they take to break down. While we

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[34] Clean Up Australia estimates have been consistent at around 2% (Clean Up Australia Rubbish Report 2002 and 2005) and Keep Australia Beautiful estimates have been consistent at just below 1% (Keep Australia Beautiful National Litter Index 2005 and 2006)

[35] http://www.scottish.parliament.uk/business/committees/environment/inquiries/pb/ERD.S2.05.27.1d%20-%20DEHLG.pdf (Accessed 16/11/06).

[36] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p. 7 and The Irish Examiner *Govt Urged to Double Plastic Bag Levy to 30c* 28 August 2006.

[37] Hyder Consulting 2006, *Plastic Retail Carry Bag Use: 2002-2005 Consumption*, p. 7

do not know with certainty how long the bags may last as they have only been in use for less than 50 years, some estimates indicate plastic bags may take as long as 1000 years to break down.[38] The rate of break down will depend on the manufacture of the bags and the moisture content, acidity, and oxygen availability in the receiving environment. Standard 'non-degradable' plastic bags photodegrade, which means they break down into increasingly small pieces over time due to the actions of sunlight and friction on the polymer. It takes much longer for a plastic bag to break down in water than it does on land. As polyethylene is a relatively new material, no micro-organisms have evolved that are capable of digesting it. The impacts of a littered bag can therefore be compounded by the bag's persistence over time.

This consultation RIS does not attempt to place a dollar value on wildlife or habitats adversely affected by plastic bag litter. It assumes that this value is inherent in the efforts undertaken by community volunteers through clean-up days. ACG report[39] provides additional detail on the valuation of the environmental costs associated with plastic bag litter.

The estimated value of reducing the environmental damage attributable to plastic bag litter accounts for all of the potentially damaging aspects of a littered plastic bag. It assumes that the people who voluntarily pick up littered plastic bags do so because they are concerned about the potential of the bags to have a negative impact on:

- marine biodiversity
- other wildlife or livestock
- drains and sewers, especially blockages leading to flooding
- aesthetics of a neighbourhood or other valued locations.

Although recent bag reduction efforts may have reduced the number of bags entering the environment, tens of millions of plastic bags may still enter the environment each year. If clean-up efforts are not successful in removing 100 percent of littered bags in a given period, these bags can accumulate. This implies there is an ever-increasing number of bags in the environment that can cause potential damage to flora and fauna.

The impacts of plastic bag litter on the environment, government, private enterprise and the public are outlined in additional detail below.

3.6.1 Environmental impacts

A littered plastic bag will be dispersed by the wind until it snags on an object on land or enters a water way. In the marine and other aquatic environments, fauna can be harmed through entanglement, suffocation, and ingestion of plastic bags.

Marine debris, which includes plastic bags, is considered to be hazardous to all sea creatures, and an added danger to the survival of species already listed as threatened or endangered under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. To address the negative impacts of litter in the marine environment, including plastic bag litter, the Australian Government has implemented measures to reduce the impacts of marine debris. For example, Australia is a signatory to the *International Convention for the Prevention of Pollution from Ships* (MARPOL 73/78). Under this convention, disposal of plastics (including plastic bags) at sea is

[38] Westaway, K., *The Scourge of Our Seas and Oceans* June 2004 http://www.ecovoice.com.au/issues/issue%2010/X28ECO10_011P.pdf (Accessed 19 November 2006)
[39] ACG Report May 2006 Appendix D p70

totally prohibited.[40] On 13 August 2003, the Australian Government also listed 'injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris' as a key threatening process under the EPBC Act [Part 13 s183].[41] Plastic bags form part of marine litter, albeit at a low level and with an arguably low impact compared with debris such as discarded fishing nets.

It is difficult to accurately determine numbers of animals killed and harmed specifically by plastic bag litter.[42] Studies often refer to marine debris or plastic debris rather than plastic bags *per se*. Plastic bags are a component of plastic marine debris along with things such as plastic sheeting, bottles, and fishing nets. One 1997 study found that at least 267 species worldwide had been affected through both entanglement and ingestion of marine debris, including sea turtles seabirds, marine mammals, as well as numerous fish and crustacea.[43] Entanglement in debris can wound animals, impair their mobility, or strangle them. Birds, sea turtles, and marine mammals can swallow debris such as convenience food packaging and plastic bags, which interfere with their ability to eat, breathe, and swim. Sea turtles can ingest floating plastic bags, mistaking them for jellyfish[44].

During the 2002 International Coastal Clean-Up, which took place in 100 countries worldwide, plastic bags accounted for 5.4 percent of all litter found. Plastic bags were the eighth most common item found, and first in the dangerous debris item list, with 3.1 percent of all animals found dead during the survey having been entangled in plastic bags.[45] Please note that this conclusion is based on limited data. It has been included in this consultation RIS in order to provide a broader perspective on the possible impact of plastic bag litter. Also, the statistics in this particular report are not directly relevant to the Australian context.

The US National Oceanic and Atmospheric Administration found that plastic bags may wrap around living corals and smother them.[46] Plastics in the marine environment take longer to break down due to lower seawater temperatures with some estimating that plastics may take up to 1000 years to degrade at sea.[47] The marine impacts of plastic bag litter need to be considered, given that Australia has sensitive and highly valued marine environments including the Great Barrier Reef.

Questions for consultation

- **Do you have quantifiable data on damage to the Australian environment and/or harm to wildlife or livestock, directly due to littered plastic bags that is not already considered in the consultation RIS?**

[40] DEH (2003) "Harmful Marine Debris" http://www.deh.gov.au/biodiversity/threatened/publications/marine-debris.html

[41] http://www.deh.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl

[42] Nolan ITU 2002, *Plastic Shopping Bags – Analysis of Levies and Environmental Impacts,* Melbourne, p. 30.

[43] Laist, D.W. "Impacts of Marine Debris: Entanglement of Marine Life in Marine Debris, Including a Comprehensive List of Species with Entanglement and Ingestion Records." In Marine *Debris: Sources, Impacts and Solutions*, ed. J.M. Coe and D.B. Rogers. New York, NY: Springer-Verlag, 1997 p102.

[44] Bugoni et al. 2001 'Marine Debris and Human Impacts on Sea Turtles in Southern Brazil' in *Marine Pollution Bulletion* Vol 42 No.12 p1332

[45] Maine Conservation Society *Long Term Impacts of Plastic Bags in the Marine Environment*, , Ross-on-Wye, UK, August 2004.

[46] NOAA National Ocean Service Education http://www.nos.noaa.gov/education/kits/corals/coral09_humanthreats.html (Accessed 19 November 2006)

[47] Maine Conservation Society *Long Term Impacts of Plastic Bags in the Marine Environment*, , Ross-on-Wye, UK, August 2004.

- **Are there other environmental impacts that should be considered, what are they and how should they be considered?**

3.6.2 Social impacts and community attitudes

Plastic bag litter in public places or on private property is unsightly and inconvenient to manage. To some extent, the costs associated with the impacts of plastic bag litter on the visual amenity of an area are intangible, but the clean-up costs are generally borne by the manager of a public place or by volunteers. In relation to plastic bags in this Consultation RIS, amenity relates to the pleasant physical characteristics of a place that is conducive to ecological health and public enjoyment of that place.

Litter collection undertaken by governments or volunteers provides a cleaner environment which benefits the entire community. As noted in the ACG report, it is difficult for individuals to articulate a reliable 'willingness to pay' for a cleaner environment.[48] It is harder still to allocate a value to achieving a plastic bag litter-free environment.

To some extent, a value can be derived from observed behaviour, and this is the valuation method adopted in the accompanying cost-benefit analysis by ACG. For example, many people freely volunteer their time to improve their environment by removing litter from it. Rather than relying on survey responses, the value they attach to litter reduction can be estimated from these actions. An initiative in this regard is Clean Up Australia Day.

In 2005, approximately 1.5 million hours of time were donated by 678,146 volunteers to the Clean Up Australia campaign. At an average remuneration rate of $16.00 per hour (derived from an average weekly earning of $810.60 and adjusted for income tax), this represents a resource input of approximately $24 million. Of this resource input, $480,000 can be attributed to the collection of plastic bags, as they account for two percent of the litter stream. With approximately 20 million plastic bags collected, this gives a value of just over $0.02 per plastic bag. This valuation takes into account the full range of environmental impacts, with the assumption that the volunteers who collect plastic bag litter do so because they are concerned about the full range of aesthetic, biological, and economic damage that littered plastic bags can cause. More information about this valuation can be found in the cost-benefit analysis by ACG, which accompanies this RIS.[49]

There is evidence that people will litter more in places where litter is already visible, as they view the area as already degraded. Disposal behaviours are influenced by the environment in which a person finds themselves. These may be undesirable or positive behaviours.[50]

Litter in scenic places can have negative impacts on tourism, particularly in roadside areas. Degraded scenic areas are less likely to attract visitors. While no information is available on such impacts in Australia, before a plastic bag levy was introduced in Ireland, litter (especially plastic bag litter) was seen as having a negative impact on perceptions of that country as a tourist destination:

> The litter problem was a prominent issue for the [Irish] government because of the severe damage it was inflicting on the Irish 'green image'. It was feared that tourism, one of Ireland's largest industries, would be

[48] ACG Report May 2006, p. 18
[49] ACG Report May 2006 p 18
[50] http://www.communitychange.com.au/Community%20Change%20-%20Special%20Info/ordercd.html (accessed 26/04/06)

negatively affected as a consequence of the degradation of the environment. The food industry, which based a significant amount of their marketing strategies on a healthy, wholesome reputation, also suffered as a result of the increased litter and pollution. The most visible element of litter was plastic bags.[51]

Impacts on amenity are likely to differ depending on the site, and are likely to be greater in populated areas as the same bag may impact more people. The actual environmental impacts are likely to be greater in otherwise pristine environments because of the magnitude of impact on amenity. Litter from plastic bags can also reduce land values in the vicinity of waste management (landfill) sites, which if not managed appropriately may be a source of plastic bag litter.

There is community concern about plastic bags in the environment, particularly in the form of litter. People are concerned about the impact of plastic bags in public places, parks, on beaches, in the countryside, and want these areas to be free of plastic bag litter. The costs of cleaning up current levels of plastic bag litter are generally borne by either governments or volunteers, not just those who litter. This is a market failure.

Community concern continues to gain momentum. A Roy Morgan study in August 2004 found that 93 percent of Australians were concerned about the impact that plastic bags had on the environment. This is reflected in the sale of 9.9 million green bags in the period from 2002 to 2005, as reported by major supermarket retailers in July 2005.[52]

The variety and extent of community-based and local government anti-plastic-bag activities shows that there is national concern about the impact of plastic bags on the environment. For example, 180 councils Australia-wide participated in the 'Bag Yourself a Better Environment' campaign run by Clean Up Australia in 2003. Councils promoted these initiatives to the community and, in some areas, used it as a fund-raising activity for local schools. In 2003, for example, one Woolworths supermarket in Gunnedah, New South Wales, collected 150 bins of bags, donating $5 to the local school for every bin full of plastic bags collected (with $750 being donated in total[53]).

A Newspoll survey commissioned by Clean Up Australia in April 2005 found that 81 percent of adult Australians favour a ban on single-use plastic bags. This sentiment is felt Australia-wide, with similar results among men and women, across all age groups, and for white and blue collar workers. If shoppers do use a plastic bag, 46 percent said it was because they were always given one by retailers; 35 percent said there were no alternatives available to purchase in store.[54] Another Newspoll survey showed that 69 percent of South Australians now shop with a reusable bag and 87 percent will say no to a plastic bag, which is on par with the national average.[55] A survey undertaken by Planet Ark in 2003 identified that eight out of ten Australians supported a levy on plastic bags.

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[51] http://www.colby.edu/personal/t/thtieten/litter/htm, downloaded on 29/01/2006.
[52] ARA Final Plastic Bag Reduction Report http://www.ephc.gov.au/pdf/Plastic_Bags/ARA_Plastic_Bag_Report_Dec_2005.pdf (Accessed 10/1/07)
[53] Woolworths Ltd *National Packaging Covenant Action Plan 2003 p13* *http://www.packcoun.com.au/ActionPlans/ap_Woolworths_Y1R.pdf* (Accessed 29/11/06)
[54] Clean Up media 29/5/05 http://www.cleanup.com.au/main.asp?RequestType=MediaReleaseInandSubRequestType=DetailandMediaRelID=248
[55] Source: Cleanup Media 29/7/05 http://www.cleanup.com.au/main.asp?RequestType=MediaReleaseInandSubRequestType=DetailandMediaRelID=270

Community support for targeting plastic bags is evident in the success of plastic bag reduction programmes in communities such as Coles Bay, Tasmania, Huskisson, New South Wales, and on Lord Howe Island, New South Wales. Lord Howe Island was the 2004 winner of the Keep Australia Beautiful, Plastic Bags Reduction Initiative Award in the community category. Coles Bay was awarded the Environmental Excellence Award by the Tasmanian Government; the programme's instigator won the national Local Hero Award for 2005 and Tasmanian of the Year in 2005.

A nationwide government survey,[56] conducted in April 2006, confirmed that community concern remains widespread. It found that 37 percent of respondents had taken action to reduce their use of plastic bags in the past twelve months, with an additional 43 percent taking action more than twelve months before.

Clearly, there is broad community concern about the use of single-use plastic carry bags, which is translating into a willingness to take action on the part of local retailers, governments, NGOs and the wider community. Policy measures to reduce consumption of plastic bags – aimed at ultimately reducing litter impacts – are likely to be well received by a percentage of the community. However, it should also be noted that single-use plastic carry bags are highly valued by some consumers for transport and reuse purposes.

The high level of community interest does not necessarily mean that plastic carry bags should be placed as a higher priority than other policy issues to be considered by governments. It does mean, however, that the development of policy solutions will need to consider social issues and views as well as the environmental impact.

Questions for consultation:

- **Can you provide information of anti-plastic bag litter activity or measures in your local area and where possible, indicate the level of success of this action?**

3.6.3 Damage to boating and auto industry

Plastic debris including plastic film (which includes plastic bags) can damage propellers, and clog seawater intakes and evaporators, causing potential engine failure, costly repairs, and delays. This type of vessel disablement can be life threatening if the boat is stranded a long way from land. However the proportion of disablements due directly to plastic bags is not clear. In 1998, the Royal National Lifeboat Institution (United Kingdom) attended 200 incidents of damaged propellers, 11 percent of which were life threatening.[57] In the Australian context similar breakdown incidents have been reported although, again, the proportion due to plastic bags has not been determined. However, a Western Australian paper reported 'flotsam, jetsam, especially plastic bags' can result in costly repairs.[58] In 2002, the Boating Industry Association of NSW and the Boating Industry Association of Queensland reported that plastic bags caused millions of

[56] OmniAccess Consumer Survey prepared on behalf of Department of Environment and Conservation, NSW and conducted during 22-23 April 2006 nationwide of 1,000 households. Respondents were asked, "which of the following best describes you and any actions you may have taken to reduce your use of light weight plastic shopping bags." 13% Within the last 6 months, 24% in the last 6 to 12 months, 23% between 1 to 2 years ago; 20% over 2 years ago, 16% I do not do anything to reduce my use and 3% NA or I don't use bags

[57] Maine Conservation Society *Long Term Impacts of Plastic Bags in the Marine Environment,* Ross-on-Wye, UK, August 2004.

[58] Barry Wiseman, 'Breakdown service 'bags' rubbish, The West Australian Saturday 11/03/06)

dollars worth of damage to boat engines each year, as they often became wrapped around propellers and water intakes, 'cooking' the engine.[59]

In 2003, Mark Skaife, with the support of Federal Liberal MP, Bruce Billson, launched an anti-litter campaign aimed at plastic bags after his Commodore V8 Supercar engine overheated. This occurred during the 2002 Bathurst 100 car race when three plastic bags blowing across the track were caught by his vehicle and blocked the radiator cooling. While Skaife went on to eventually win the race, Craig Lowndes' race was stopped by a plastic shopping bag in the same event. Skaife said:

> It's about time that everybody took responsibility for their own litter and made sure that it's disposed of properly, rather than blowing about and getting into our waterways. Programs such as Clean the Stream are the best way to get the message across to young people, who are very environmentally aware. They know that litter can block streams and even kill wildlife. And of course from my own experience, plastic bag litter could be the difference for me between winning and losing a big race. And that's another reason for motor sport fans at the Foster's Australian Grand Prix to do the right thing by putting their litter into a bin and not letting it blow about.

Mr Billson said publicity about the number of plastic bags that get into the litter stream and pollute local waterways had highlighted the need for action by industry and the community to reduce litter of all types.[60]

This section of the consultation RIS shows that adverse impacts of plastic bag litter are more widespread than negative impacts on flora and fauna. It seeks the advice of affected stakeholders on the nature and cost (quantified where possible) of those impacts identified here and of other impacts that may not have been identified.

Questions for consultation

- **What is the scale of the impact plastic bags have on boating and car activities? Is there quantitative data on incidents and associated costs?**
- **What measures are currently taken to address the impact of plastic bags on these types of machinery?**
- **Do you know of other incidents in which plastic bags have caused damage to persons or property (eg impacts on farmers from livestock eating plastic bags, or in the aviation industry) and are you able to provide information on the nature and costs of these impacts?**

3.6.4 Clean-up and infrastructure

While there are insufficient data to enable a complete breakdown assessment of the costs associated directly with plastic bag litter, indicative costs of litter management in general are available. This section outlines current costs of litter management, from which inferences can be drawn relating to plastic bag litter management.

The Nolan-ITU report, *Plastic shopping bags: analysis of levies and environmental impacts* (December 2002), states that approximately $200 million per year is spent by local and state governments on

[59] Simon Kearney, 'Boat Industry Backs Levy', Sunday Telegraph (Sydney), p4, 6/10/02

[60] http://www.v8supercar.com.au/news/latestnews/newsdisplay.asp?gid=5849 (Accessed 9/1/2007)

total litter clean-ups. This is in addition to the money spent by private sector landfill operators, and community organisations such as Clean Up Australia. Assuming plastic bags are no more than two percent of the litter stream, Nolan-ITU attributed a cost of $4 million to cleaning up plastic bag litter.[61]

Governments in each jurisdiction also fund additional clean up activities. For example, in Victoria litter traps are installed in some waterways to remove large pollutant matter. It has been estimated that stormwater gross pollutants are composed of approximately 20 percent litter (plastic, paper and metal) and 80 percent organic material (such as leaves and twigs), and about 100 000 cubic metres of gross pollutants (1 billion items of litter) reach Melbourne's waterways each year. Victorian councils spend over $50 million sweeping the streets, emptying and servicing street litter bins and litter traps, and cleaning up litter each year.[62] While this remains a significant cost, it is difficult to determine accurately what percentage is attributable to plastic bag litter, or indeed whether costs of clean up would be reduced if all plastic bag litter was eliminated. Nevertheless it indicates the sort of the costs associated with clean up activities.

3.7. Waste management

3.7.1 Landfill

The problem with plastic bags in landfill is not the mass of plastic taking up space in landfill – it is the costs associated with managing plastic bags at waste management sites. These include clearing anti-litter fences around landfill sites and addressing the complaints from neighbouring properties affected by wind-blown litter.

The National Packaging Covenant Council (NPCC) concluded in 2002 that the major impact associated with the disposal of plastic bags was not their impact in the landfill, which are designed to be as stable as possible, but as litter. Nolan-ITU noted in 2002 that 47 percent of the litter at or around landfills was plastic litter, with a proportion of this material being plastic bags.[63] Complete elimination of plastic carry bags is likely to result in a switch to other, possibly heavier duty bin liners. The resource impacts of such a shift are not fully understood but would need to be factored into any future decisions.

To complement existing state and territory litter regulations and in response to a recommendation from the 2002 Plastic Bag Working Group, the EPHC released, in 2005, guidelines for public place litter management and for landfills.[64] The public place guidelines were developed for managers of outdoor public places such as shopping precincts and recreational parks, roadside rest stops, car parks, public transport nodes, sport venues and other places where large gatherings congregate. The landfill guidelines are designed to help managers of unattended and attended landfills reduce generation of plastic bag litter. The aim of the guidelines is to protect residents and the environment from the off-site litter effects arising from landfills that receive municipal waste.

[61] Nolan-ITU, 2002, Op. Cit, p. 8
[62] Melbourne Water website: http://wsud.melbournewater.com.au/content/treatment_measures/litter_traps/overview.asp (Accessed 5/1/2007)
[63] Nolan-ITU, 2002
[64] http://www.ephc.gov.au/pdf/Plastic_Bags/Landfill_litter_guidelines_Jun05.pdf (Accessed 9/11/2006)

3.7.2 Material recovery facilities (MRFs)

It is difficult to distinguish costs associated with plastic bag litter from other general running costs of MRFs. For all jurisdictions, it appears that the costs of dealing with all litter are substantially absorbed into the running costs of MRFs and landfill sites. While downtime is caused by plastic bags damaging MRF equipment, and there is extra maintenance to untangle and remove plastic bags, the extent of this is difficult to quantify.

3.7.3 Compost and organics recovery industry

Plastic bags form a major contaminant in the composting industry and their presence has forced operators to undertake manual sorting of kerbside collected material, and invest in mechanical sorting and in specialised equipment to reduce contamination in the final product.[65] Shredders need to be used instead of grinders, manual picking of final spread compost or mulch material is often required to reduce plastic contamination of the product. Whilst the weight of plastic bag contamination is very low, bags or pieces of plastic bags can be visually obvious in the final product. Such contamination restricts markets for compost where compost can save water, increase productivity and yields of various crops in intensive agriculture. Also, once separated from organic waste, plastic bags then need to be contained in bins and sent to landfill for disposal.

Questions for consultation:

- **Have all the major social and environmental impacts of plastic bags been considered?**
- **Are there other issues that should be addressed in this document?**
- **Do you have additional quantitative data on environmental impacts which should be considered?**
- **Do you have any quantitative information regarding impacts concerning plastic bags and MRF maintenance?**

[65] Communication from Jeffries Group to South Australia ZeroWaste 28/11/2006.

4. Is government intervention required?

The main justification for further government intervention is the market failure caused by environmental externalities associated with littered plastic bags. A further reason for government intervention is the public-good nature of litter abatement. In both cases, it is unlikely that the market will find a solution without further government intervention. Mandatory action by governments would create a level playing field for retailers - a diverse sector that consists of more than 200,000 retailers that may potentially distribute plastic bags.[66]

Although there has been a significant reduction in the use of plastic bags in recent years, there is reason to believe that further voluntary reductions will be very difficult to achieve, and will require well resourced and well targeted strategies. From 2002 to 2004, plastic-bag use fell from 5.95 billion in 2002 to 4.73 billion in 2004 – a decrease of 1.22 billion. However, from 2004 to 2005, plastic bag use is estimated to have fallen from 4.73 billion to 3.95 billion in 2005 – a decrease of 780 million. This indicates that the rate of voluntary reductions may be slowing. Based on reports from retailers, Hyder Consulting confirms that the rate of decline in bag use by Group One retailers has slowed over recent years. In 2002, supermarkets provided 3.64 billion HDPE bags to customers. In 2004, they provided 2.73 billion, a reduction of 0.91 billion. In 2005, supermarkets provided 2.14 billion HDPE bags to customers, a fall of 0.59 billion bags from the previous year.

This also is supported by a report from ANRA to EPHC in June 2006 that indicates that measures undertaken up until 2005 are likely to have achieved their maximum results and that new measures which capture a broader range of smaller retailers, such as take-away businesses, are required to improve on current reduction levels.

Although the reduction across the non-supermarket sector has been lower, there are exceptions. Where retailers have voluntarily introduced a charge on plastic bags the observed reduction has been much greater at around 80 percent.[67]

Importantly, the reduction in plastic bag use to date has not produced evidence to demonstrate that this has resulted in a commensurate fall in the amount of plastic bag litter, as noted earlier, Clean Up Australia and Keep Australia Beautiful report minimal change in plastic bag litter levels.[68] As mentioned in section 3.4 it is unclear how severe bag reductions will need to be before a significant reduction in plastic bag litter will be noticed.

As a general comment voluntary initiatives can provide more flexibility in application for businesses and they generally lead to lower administrative costs and faster implementation than regulation. However, voluntary initiatives by themselves may not be successful where:

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[66] In 2004 ABS figures indicated there were around retail 200,000 businesses, excluding motor vehicle retailers, Note not all retailers may distribute plastic bags. http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/090DA0FCAF499A6CCA257092007506D3/$File/8161055001_jun%202004.pdf (Accessed 9/1/07).

[67] Australian Bureau of Statistics – Australia's Environment: Issues and Trends 2006 http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/5BC32E8955FEF5E3CA2572210019AF02/$File/46130_2006.pdf (Accessed 9/1/2007)

[68] Keep Australia Beautiful National Litter Index 2005 and 2006; and Clean Up Australia Rubbish Report 2002 and 2005

- sector-wide motivation to introduce a voluntary mechanism is lacking. The voluntary approach is limited to areas where there is a business interest (for example, cost-effectiveness, avoidance of future regulations) in changing practices; or
- there is likely to be an inequitable distribution of costs amongst retailers. Voluntary measures are unlikely to motivate all companies to invest in environmental protection and cannot, by themselves, deal with negligent or consistently poor sector performers to reduce plastic bag consumption.[69]

Also, voluntary measures intended to apply to all retailers will be very difficult to implement given the large number of retailers.[70]

The costs of plastic bag litter cleanup are not borne equitably, as the entire community (through rates or tax) bears the cost of government cleanup measures, regardless of whether they use plastic bags. Those retailers who continue to provide plastic bags to consumers, and those consumers who continue to use plastic bags, enjoy the benefits from clean up activities that remove plastic bags from the environment whilst contributing to the number of plastic bags which may end up in the litter stream by using plastic bags.

One possible integrated approach for dealing with the problem could include policy, regulation, and economic measures, as well as education and awareness programmes. As intervention can take many forms, government is the best placed of all stakeholders to address each of these elements. Government is able to work with businesses and interest groups to promote behaviour change through activities such as education campaigns. Governments can also establish a regulatory framework and, in some cases, governments can provide funding to assist businesses in making changes. An example of the success of government intervention in partnership with industry can be seen under the co-regulatory National Packaging Covenant framework. Through the Covenant joint industry/government funds were provided to local governments and this has improved the efficiency of kerbside recycling collection practices. The impact of government intervention is also demonstrated by the greater uptake of bag-reduction efforts since the EPHC became involved in seeking solutions to problems associated with plastic bags.

Given that the impacts of plastic bags are felt in all jurisdictions and inaction has the potential to impact a variety of sensitive environments, one of which is World Heritage listed, and given that participation in the voluntary measures undertaken by retailers to date has not been sector-wide there may be justification for governments to act.

Questions for consultation:

- **Do you think further government intervention is required?**
- **If so, what should governments do?**
- **Are there other arguments that support government intervention?**
- **Are there other arguments that reduce that case for government intervention?**

[69] Based on the UNEP Multi-Stakeholder Workshop on Voluntary Initiatives. 20 September 2000, Paris

[70] In 2004 ABS figures indicated there were around 200,000 retail businesses, excluding motor vehicle retailers. Note not all retailers may distribute plastic bags. http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/090DA0FCAF499A6CCA257092007506D3/$File/8161055001_jun%202004.pdf (Accessed 9/1/07).

5. Objectives

The objective of government regulation, if deemed necessary, is to address the negative impact of plastic bag litter on the community and the Australian environment.

The objective of this consultation RIS is to consider whether additional government action is required to reduce the environmental impact of single-use, lightweight, plastic carry bags through possible future voluntary, co-regulatory, and regulatory action.

6. Current Measures in Place

6.1. Is there national regulation or policy currently in place?

There is no national legislation specifically aimed at plastic bags. However, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Australian Environment Minister, on advice from the Threatened Species Scientific Committee, can list a key threatening process and recommend that a threat abatement plan be developed. A process can be listed as a key threatening process if it causes:

- a native species or ecological community to become eligible for adding to a threatened list (other than conservation dependent);
- an already listed threatened species or threatened ecological community to become more endangered; and
- adverse affects to two or more listed threatened species or threatened ecological communities.

In 2003, the Threatened Species Scientific Committee advised the Government that harmful debris was affecting substantial numbers of Australia's marine wildlife, including many protected species of birds, turtles and marine mammals. The harmful debris was defined as land sourced plastic garbage, fishing gear from recreational and commercial fishing, and ship sourced, solid non-biodegradable floating materials disposed of at sea. Plastic debris was further defined as bags, bottles, strapping bands, sheeting, synthetic ropes, synthetic fishing nets, floats, fibreglass, piping, insulation, paints and adhesives.

Subsequently, the Government listed 'Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris' as a Key Threatening Process and after broad consultation, it was agreed to develop a Threat Abatement Plan which focused on all plastics and other types of debris from domestic or international sources that may cause harm to vertebrate marine wildlife. A Threat Abatement Plan is currently being drafted which has a range of objectives including to contribute to the long-term prevention of the incidence of marine debris that is harmful to threatened marine wildlife. As noted this covers a range of marine debris including plastic bags.

There are also a number of statutory measures aimed at packaging and litter and each state and territory jurisdiction has an act and associated regulations to provide for environmental protection.

6.2. The National Packaging Covenant and the National Environment Protection (Used Packaging Material) Measure

The National Packaging Covenant (the covenant) is a voluntary agreement between all levels of government and all parts of the packaging supply chain, based on the principle of shared responsibility. The covenant is the voluntary component of a co-regulatory arrangement for managing the environmental impacts of consumer packaging in Australia. It establishes a framework for the effective life-cycle management of consumer packaging and paper products. It is delivered through a collaborative approach between all sectors of the packaging supply chain, including consumers, collectors, re-processors, and all spheres of government.[71]

The regulatory underpinning for the covenant is provided by the National Environment Protection (Used Packaging Materials) Measure (NEPM), designed to deal with free riders and non-

[71] National Packaging Covenant Council (2005) *The National Packaging Covenant* (July 2005), 1.

signatories who significantly contribute to the packaging waste stream. The NEPM is applied at the jurisdictional level through state-based regulation. It provides jurisdictions with the framework to require non-signatory 'brand owners' to recover, and re-use or recycle, their packaging. The amount to be recovered is determined at the jurisdictional level and is based on covenant-equivalent actions and targets. (The recycling targets under the NEPM must take into account the targets and individual material contributions outlined in schedule 2 of the covenant.)

The covenant and NEPM specifically recognise the role of plastic bags as packaging, and their potential to become litter. In both documents, 'brand owner' in relation to plastic bags is defined as:

> *the importer or manufacturer of the plastic bag or the retailer who provides the plastic bag to the consumer for the transportation of products purchased by the consumer at the point of sale.*[72]

Schedule 7 of the covenant incorporated the ARA code (described in section 6.3 below) until it expired in December 2005. By including the ARA code in the covenant, signatories to the covenant who provided plastic bags were automatically obliged to undertake the activities set out by the ARA code. As well, fully participating signatories to the ARA code were considered to be fulfilling their obligations as a brand owner for the purposes of managing plastic bags under the covenant.

Since the expiry of the ARA code, and in the absence of any new plastic bag schedule, the only obligation for National Packaging Covenant signatories, as far as plastic bags are concerned, is to treat plastic bags as one among many types of packaging for which they are responsible. That is, they need to demonstrate in their action plans that they are reducing waste and assisting waste recovery.

Brand owners who are not signatories to the covenant or the ARA code are required to comply with the NEPM and supporting state regulation. For organisations caught by the NEPM that opt not to sign the covenant, the obligations regarding plastic bags are to demonstrate equivalent outcomes as a signatory – that is, to recover, or assure the recovery of, waste material from that organisation's packaging for re-use or recycling in accordance with targets set by the relevant state or territory jurisdiction. The organisation may also be required to prepare a waste action plan, report annually on its performance, and retain certain records for up to five years. Brand owners with annual revenues under $5 million are exempt from the NEPM.

Assessment of effectiveness

The National Packaging Covenant Council is only able to scrutinise the performance of signatories. It was designed to capture the major producers and users of packaging, not small retailers' use of plastic bags. Government jurisdictions can only take action against non-signatories of the covenant, or non-compliant covenant signatories which the Covenant Council has referred to jurisdictions for action under the NEPM.

The covenant/NEPM framework is unable to fill the gap identified by this consultation RIS in relation to the objective of plastic bag litter reduction because it only targets the large generator of packaging and not the small business or consumer. All brand owners under $5 million are

[72] National Packaging Covenant Council (2005) above n 43, 5 *[Part 1 Clause 3 (e)]*.

currently exempt from action. Importantly the exempt brand owners are likely to account for a significant percentage of retailers providing plastic bags[73] and a significant amount of litter.

For brand owners large enough to be captured by the covenant/NEPM arrangement, obligations for plastic bags and litter reduction are weak. Although key performance indicators for litter reduction are a component of the covenant reporting requirements, litter reduction has not been identified as a priority under the covenant/NEPM arrangement in terms of specific targets. The covenant targets relate to recycling and reduced dispersal, not litter abatement.

6.3. Australian Retailers Association Code of Practice for the Management of Plastic Bags (ARA code)

The ARA code was developed with EPHC, which agreed to it in October 2003. The code remained in effect until 31 December 2005. It addressed the challenge from EPHC to retailers to reduce and recycle bags made from high-density polyethylene (HDPE). The initiative committed retailer signatories to work with governments, other industries and the broader community to influence behavioural change and substantially reduce the number of bags used, and as a consequence, the number of bags available to enter in the litter stream. The ARA code promoted the use of alternative heavyweight multiuse bags (e.g. 'green' bags) to encourage customers to change their plastic bag habits.

Different commitments for retailers were made by Group One retailers (major supermarkets) and Group Two retailers (all others providing plastic bags).

The Code sought a 90 percent coverage of all Group One retailers. The ARA code required reporting by Group One signatories every six months on the following targets:

- 25 percent reduction in the numbers of HDPE bags issued by the end of 2004
- 50 percent target for reduction in the numbers of HDPE bags issued by the end of 2005
- a recycling rate of 15 percent by the end of 2005 for HDPE bags issued by the store being returned to the store or, if plastic bags could also be recovered through kerbside recycling rate, a 30 percent recycling rate by the end of 2005.

The Code also sought by the end of 2004, a 25 percent participation rate of Group Two retailers who were members of the ARA. Actions for Group Two retailers focused on raising awareness of the ARA code and adoption of recommended in-store bag reduction activities. In terms of coverage, the 25 percent target was not achieved. Of the potential pool of several thousand[74] ARA Group Two members, 30 members indicated though a survey in 2005, that they adhered to the code. Of the total pool of up to 135,000 Group Two retailers[75] who may supply plastic bags, it is unknown how many retailers who were not ARA members undertook voluntary bag reductions outside of the formal code framework or were even aware of the code.

While some smaller retailers and retail chains have dramatically reduced plastic bag use, the most significant proportion of reduced plastic bag use in recent years is attributed to the strong voluntary actions taken by major supermarket retailers. The proportion of plastic bags supplied by

[73] In 2004 ABS figures indicated there were around 200,000 retail businesses. http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/090DA0FCAF499A6CCA257092007506D3/$File/8161055001_jun%202004.pdf (Accessed 9/1/07)

[74] The exact number is unknown

[75] ABS Retail Business Survey frame September 2005. Note that the counts are approximate only.

major supermarkets and smaller retailers has shifted, as major retailers have reduced the number of plastic bags distributed – supermarkets are estimated to have used 1.5 billion fewer bags in 2005 than in 2002. It is currently estimated that supermarkets distribute around 55 percent of all plastic bags, down from the 2002 baseline of 65 percent.[76]

With the expiry of the ARA code on 31 December 2005, there is now no obligation for retailers to continue to implement further bag reduction strategies. However, in May 2006, ANRA proposed a new voluntary code, with the aim of it being taken up by all the existing Group One retailers and any prospective members of ANRA. The likely impacts of this proposal are discussed in greater depth in section 7.4 of this consultation RIS.

Assessment of effectiveness

Signatories to the code reported every six months. The final report indicated that large supermarkets (Group One retailers) had achieved a 44.75 percent reduction against the 2002 baseline by December 2005. An independent review by Hyder Consulting, on plastic bag usage over the period 2002 to 2005, confirms that reductions have been occurring, and notes an absolute reduction of 41.4 percent by the supermarket sector.[77] In this respect, the ARA code has been effective in reducing supermarkets' use of plastic bags.

While the ARA code successfully engaged Group One retailers, engagement with Group Two retailers was more difficult, emphasising the likely difficulty in pursuing further voluntary measures. Group Two retailers are typically small to medium-sized enterprises with less than 200 staff, possibly family-run or franchise-owned, with a high proportion of casual as well as culturally and linguistically diverse staff. Identifying target retailers and activities to gain their attention, and subsequent commitment to act, proved challenging although some progress was made by the Australian Government in convening a retailer Roundtable meeting in September 2004 with attendance from a range of non-supermarket retailers or their associations. Nevertheless, this initiative reached only a small proportion of all retailers.

While anecdotal evidence indicates that some of smaller retailers, both within and outside the ARA, have been very active in reducing their use – and positive case studies abound – there is little collated data available on their activities. Hyder Consulting estimates that plastic bag use by non-supermarket retailers was 22.9 percent lower in 2005 than in 2002.

A fax-back survey of Group Two retailers conducted by the ARA early in 2005 demonstrated the difficulty in reaching these small businesses. Of the 2334 surveys sent, only 1695 were sent successfully and, of those, only 6.5 percent of businesses responded. This perhaps highlights the difficulty in engaging small business owners on issues that they believe are of marginal importance to their businesses.

In a follow up survey, the ARA reported in early 2006 that out of a possible 2558 retailers who were faxed a survey by the ARA, only 151 small retailers confirmed that they had signed the ARA code. As the ARA code is a voluntary agreement, the association cannot force non-members to sign it. It is possible that some small retailers are taking actions to reduce plastic bags while not

[76] Hyder Consulting, Op. Cit, p.8

[77] The difference between the number provided by ANRA for Group One retailers (44.75%) and the Hyder Consulting estimation (41.4 percent) is attributable to the methodology used by Group One retailers, which makes allowances for store growth since 2002.

formally being signatory to the ARA code. However, the informal nature of these activities means that there are no data on their effectiveness.[78]

Behavioural change brought about by the ARA code, and other voluntary measures, may have peaked because the proportion of shoppers most likely to change their habits have already done so. A nationwide government survey conducted in April 2006 confirmed this view. It found that the majority (67 percent) of respondents had first taken action over six months to two years ago with only an additional 13 percent having taken action for the first time in the last six months.[79]

There is also the issue of equity regarding a voluntary approach. The cost of recent initiatives, such as the ARA code of practice, has not been borne evenly by all retailers. Some retailers have indicated that they would be likely to support further reductions in plastic bag use, but there may be competition implications if these efforts were not evenly borne across the whole industry.

Certainly, through the efforts of major retailers, the code has been very successful in raising consumer awareness of the value of switching to reusable bags.

6.4. State and territory environment protection regulatory measures

Each state and territory government has in place environment protection legislation and associated regulations. The legislation each provides an overarching framework at the state or territory level, which, in turn, provides for the prevention, control and abatement of pollution and environmental harm; the conservation, preservation, protection, enhancement and management of the environment; and matters incidental to or connected with the foregoing. Nested within these state frameworks are specific acts and/or regulations pertaining to waste management.

These regulatory measures are designed to enable designated personnel (authorised officers) to respond to a range of offences relating to pollution to land, water and air. In relation to plastic bags, the environmental protection measures are likely to control the transport of collected municipal and commercial or industrial wastes, their final disposal destination, in addition to the collectors and transporters themselves. That is, they are designed to address the end result of littering rather than the supply of packaging like plastic bags at the retailer's point of sale. Disposal behaviour such as littering is usually covered by separate legislation.

Victoria has amended its *Environment Protection Act 1970* to enable the Victorian Government to require retailers who choose to supply plastic bags to charge a minimum fee to consumers receiving those bags. This legislation is intended to commence in 2009, if plastic bags are not phased out through voluntary measures by then.[80]

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[78] The Independent review by Nolan-ITU also found there has been a fall in the imports of low density polyethylene, those used in boutiques, suggesting further the changes to the habits of retailers issuing bags.
[79] OmniAccess Consumer Survey prepared on behalf of Department of Environment and Conservation, NSW and conducted during 22-23 April 2006 nationwide of 1,000 households. Respondents were asked, "which of the following best describes you and any actions you may have taken to reduce your use of light weight plastic shopping bags." 13% Within the last 6 months, 24% in the last 6 to 12 months, 23% between 1 to 2 years ago; 20% over 2 years ago, 16% I do not do anything to reduce my use and 3% NA or I don't use bags.
[80] Media Release *Free Plastic Bags to be Banned in Victoria* 17/07/06 http://www.dpc.vic.gov.au/domino/Web_Notes/newmedia.nsf/bc348d5912436a9cca256cfc0082d800/491f47ce914bdcb1ca2571af00023181!OpenDocument (accessed 28/11/06). Victorian Act was amended in August 2006 http://www.epa.vic.gov.au/about_us/legislation/amendment_act.asp#plastic (access 28/11/06)

6.5. Anti-litter activities to manage plastic bag litter

As noted earlier local and state governments spend approximately $200 million annually on litter clean-up, in addition to private companies such as Clean Up Australia who contribute considerable resources to litter clean-up.[81] Powers derived from anti-litter regulations are usually divided between authorised state government agencies and local government. The common model employs a suite of measures including on-the-spot fines, clean up notices and penalties with varying degrees of severity. For example, some jurisdictions like Western Australia and Victoria, encourage members of the public to report littering from vehicles via a phone 'hotline' or website form.

The following table indicates the types and scale of fines for littering in each jurisdiction.

Table 6.1 Litter offences and penalties by jurisdiction

NEW SOUTH WALES	Littering of small items General litter (including from vehicles) Aggravated littering (threat to public safety)	$60 $200 $375
VICTORIA	A range of littering offences Littering of small items Aggravated littering	$210 (on the spot) $105 $6446 (in court)
QUEENSLAND	On the spot littering fines	$150
WESTERN AUSTRALIA	Cigarette butts Discarding litter (streets, parks, picnic grounds, roadsides) Dangerous litter (glass)	$75 $200 $200
SOUTH AUSTRALIA	On the spot littering fines	$315
TASMANIA	On the spot littering fines	$100
AUSTRALIAN CAPITAL TERRITORY	On the spot littering fines	Up to $200
NORTHERN TERRITORY	Littering fine	$50

Assessment of effectiveness

Jurisdictions are developing assessment methodologies of general public place litter to determine the effectiveness of anti-littering laws. In the longest running example, in South Australia, there is a quarterly litter count at 151 sites across the State. These figures are analysed and reported on the Keep South Australia Beautiful (KESAB) website[82]. The counts themselves are undertaken by a third party consultancy firm, and independently audited, with ZeroWaste SA funding the counts. Plastic bags are just one of a number of common items and material types surveyed at sample sites across the state. They tend to be a small proportion of the overall range of litter encountered. Nevertheless they are highly visible and ubiquitous. In a recent NSW survey for instance, plastic bags and wraps only made up four percent of the litter counted, however they had a high occurrence - 49 of the 60 sites surveyed.[83]

The number of fines and notices distributed due to the littering of plastic bags is not easily determined as litter notices cover a range of materials and do not specifically identify plastic bags as the littered item. In addition the nature of the problem of plastic bag litter means that targeting littering behaviour may have limited impact. Inadvertent litter is a major contributor to plastic bag

[81] Nolan-ITU 2002 page 8

[82] http://www.kesab.asn.au/

[83] Source: NSW Litter Report page 15. http://www.epa.nsw.gov.au/litter/download/litter-rept04.pdf

litter,[84] which means that no individual that can be targeted with an infringement notice or similar penalty. Therefore in relation to plastic bag litter, enforcement can be difficult as the litterer cannot be identified.

Litter abatement activities are complex and need to be considered in localised contexts as studies have shown that littering behaviour varies greatly in different settings and a thorough understanding of this is required for appropriate litter strategies to be developed.[85]

The National Plastic Bag Working Group report to the National Packaging Covenant Council[86] identified potential litter abatement activities. This report noted that there was an opportunity to improve upon current litter abatement activities and strategies. However general litter has not been identified as an issue of national significance by the EPHC (other than through its work on plastic bag and cigarette butt litter). Despite litter abatement strategies being in place in most jurisdictions, plastic bag litter continues to be an issue within the community, along with other littered items. In addition special initiatives for plastic bag litter abatement have not translated into a significant reduction in the litter stream.

It can be inferred from the current levels of plastic bag litter, that current litter abatement efforts do not sufficiently manage the plastic bag litter problem and given the high level of inadvertent littering of plastic bags, enhanced enforcement is unlikely to be sufficient to adequately manage plastic bag litter as it is not possible to identify and punish responsible individuals for inadvertent litter to reduce impact on that source of plastic bag litter. However, a proposed regulatory option that specifically targets cleaning-up plastic bag litter is discussed below under Option E.

Questions for consultation:

- **Should plastic bags be addressed through general litter measures and should future focus be on strengthening general litter abatement?**
- **How would the particular environmental hazards posed by plastic bags be addressed through general litter abatement activities?**

6.6. What has been the objective of government action to date?

The objective of work by Australian governments through the EPHC has been to reduce the impact of lightweight plastic carry bags on the environment. Until now, the EPHC has endeavoured to do this primarily by reducing bag use through voluntary means although some effort has been made to alter plastic bag littering behaviour. For example, governments have also issued guidelines for better management of plastic bags at landfill sites. Environment ministers have signalled that this objective should continue over the next few years.

Since the EPHC 2003 decision to commence phase-out negotiations with retailers, EPHC has focused largely on supermarket chains. However individual jurisdictions have also been working with other retailers to achieve change. For example, the Australian Government, working in conjunction with Clean Up Australia and the ARA, launched a campaign aimed expressly at small retailers, including a website, an information package and other tools. These efforts, have impacted

[84] Nolan-ITU, 2002 p I
[85] Nolan-ITU, 2002 p. 46
[86] National Packaging Covenant *Plastic Shopping Bags in Australia* December 2002 National Plastic Bags Working Group Report to the National Packaging Covenant Council p 11.

on the overall plastic bag use, however it is estimated that 4 billion bags are still being used annually[87] and litter levels have not changed substantially.

A further objective for government is to ensure national consistency for players in national markets, including retailers who operate across borders (more than one jurisdiction), and to send consistent messages for consumer action.

6.7. Examples of other government or community anti-plastic bag litter efforts

Some communities have designated plastic-bag-free areas such as retail strips and small shopping centres. These activities are usually run in conjunction with state government and non-government organisation bag-free initiatives. The community of Coles Bay in Tasmania is considered to be the first Australian community to have done so, in April 2003. However, this action is voluntary and there are no specific requirements for enforcement.

Some local councils have extended such initiatives to the entire council area. For example the Mackay City Council Plastic Bag Reduction Programme is a partnership between council and retailing groups, including major shopping centres and individual stores. As part of this program, the council introduced a 50 percent subsidy program for Mackay residents on presentation to the council of the receipt for the purchase of ten $1.00 reusable bags.

In April 2004, the Victorian Government called on communities across Victoria to take up the challenge to reduce the use of plastic carry bags in their community. The Plastic Bag Free Challenge, a partnership between the state government, Planet Ark, and regional waste management groups, was accepted and undertaken by twenty-eight areas in Victoria, including towns, shopping strips and markets. Communities received grants to purchase plastic bag alternatives and promote the challenge to their residents and retailers.

Assessment of effectiveness

Actions undertaken by communities are voluntary, and unique to a specific retail precinct or local government area. Often they rely on 'champions' within the community to drive and maintain these changes. There are other successful examples of local approaches, such as the plastic bag reduction in Esperance which was one of several communities that have been acknowledged by Keep Australia Beautiful for plastic bag reduction efforts.[88]

Questions for consultation:

- **Are there other examples of relevant government action that have not been considered here?**
- **How effective have campaigns like those mentioned above, been in reducing plastic bag litter in local areas? Can you provide quantitative data?**

[87] Hyder Consulting, May 2006, *Plastic Retail Carry Bag Use 2002-2005 Consumption: 2005 end of year report*, p.1

[88] 'The Shire of Esperance wins State and National award for Bag Smart Program' The Esperance Express 9/11/06

7. Statement of Proposed Alternatives – costs and benefits

This section looks at the potential policy and legislative alternatives for managing the impacts of plastic bag litter. The options discussed in this section are presented in two general groups: options which focus on litter abatement and litter clean up to reduce plastic bag litter; and options which focus on plastic bag reducing consumption to reduce plastic bag litter.

It is recommended that this consultation RIS be read in conjunction with the accompanying reports by ACG. For the purpose of the consultation RIS, some of the key assumptions specific to each option are outlined in the description of the option below. Importantly, readers should note that the ACG modelling values the removal of each plastic bag from the environment or the prevention of one entering the environment at $1.00. Readers should note that this figure has been significantly scaled up from the estimated value of keeping one plastic bag out of or removing it from the environment, estimated to be $0.02 per bag. The $0.02 figure was calculated from a national clean up effort. This value was increased to account for un-counted litter clean-up activities and to reflect that only a small proportion of the Australian public was involved in that particular clean up effort. It is discussed in detail further in the ACG May 2006 report, in particular on pages 18 and 70. ACG explains that an alternative approach to valuing may place greater value per bag on the plastic bags that are removed from the environment first, with the value per each additional bag decreasing as plastic bag litter levels decline. This approach was not applied in the ACG analysis because of limited data points, however ACG noted that the relative costs of each option were likely to be similar under the alternative modelling.[89]

Commencement dates of the options should be noted. The commencement dates of some of the options, in particular some of the voluntary approaches are assumed from 2005 rather than 2009 in line with activity proposed under the option. The cost/benefit analysis end point for all estimates is 2016.

The options are compared to a baseline of 'no further government action'.

Further assumptions are reflected in the consumer demand curve in ACG report.[90] The demand curve is a key determinant for the revenues associated with bags sales and the costs estimated for modelling purposes. For example ACG has assumed that a charge of 25 cents for plastic bags would result in 100 percent reduction in consumption.[91] This assumption impacts on the level of revenue raised in all charge based options.

Readers should be mindful that exemptions considered in the definition under section 2.1 were not costed under the ACG reports, and further cost estimates may be required. Under this definition, some bags would be exempt from any regulatory action primarily to protect health and safety and the definition would allow the use of non-target bags.

There are a range of unquantified benefits that relate to social benefits derived from each option. These social benefits include: how people feel about a plastic bag free environment; the positive feeling people experience in having a clean local environment (civic or national pride); predisposing people to environmental awareness and action in general; a sense of well being in contributing to a cleaner and healthier environment; encouraging people to do more outdoor

[89] ACG Report May 2006 p 72-3
[90] ACG Report May 2006 p 13
[91] ibid

activities and have a healthier lifestyle; and positive impacts on tourism.[92] While the level of litter was higher than in Australia, Ireland took regulatory action against plastic bags out of a concern that the litter would impact on tourism, Ireland's second largest industry.[93]

Questions for consultation

- **What other matters should be considered under the unquantified benefits?**
- **Are the assumptions used in the modelling reasonable?**

In accordance with the Council of Australian Government guidelines for consultation RIS development, the 'business cost calculator' has been applied to some options to draw out more information about the assumptions and costs to small, medium and large businesses. In preparing the consultation RIS the mandatory charge and ban options (option J and option L respectively) appeared to be the regulatory options that could be implemented most effectively if regulation is deemed necessary. As such, the business cost calculator has been applied to these options and can be reviewed under section 7.4.

7.1. Options cost benefit analysis

The options considered in this consultation RIS for managing plastic bag litter are:

Litter Focused Options

- Option A: Enforcement
- Option B: Behaviour change
- Option C: Litter clean up
- Option D: Litter infrastructure
- Option E: Advance disposal fee (*ACG scenario 7)*

No further government action

- Option F: baseline scenario *(ACG scenario 2)*

Plastic Bag Consumption Focused Options

- Option G: extension of ARA code of practice beyond 1 January 2006 (*ACG scenario 3)*
- Option H: industry agreement to impose a gradually escalated charge, supported by government co-regulation measures such as a NEPM (*ACG scenario 4)*
- Option I: industry agreement to phase out plastic bags in the short term, followed by government regulation to phase out remaining bags from 2009 (*ACG scenario 5)*
- Option J: retailers obliged by regulation to impose a minimum charge for plastic bags; retailers retain revenue from charge (*ACG scenario 8)*
- Option K: government imposes levy on plastic bags (*ACG scenario 9)*
- Option L: elimination (ban) of plastic bags by government regulation on 1 January 2009 (*ACG scenario 1)*

[92] Links have also been made between a littered environment and crime (note litter in general, not specifically plastic bag litter) http://www.allentownrecycles.org/template.jsp?id=47 (accessed 15 November 2006); http://www.dca.state.ga.us/environmental/kgb/whats_the_problem.html (accessed 15 November 2006)

[93] In a submission to the Scottish Parliament, Ireland stated that prior to the introduction of the PlasTax, plastic bags accounted for 5 percent of the litter stream. http://www.scottish.parliament.uk/business/committees/environment/inquiries/pb/ERD.S2.05.27.1d%20-%20DEHLG.pdf (Accessed 16/11/06).

- Option M: elimination of plastic bags by government regulation prior to 1 January 2009 (*ACG scenario 6)*
- Option N: a voluntary commitment by retailers to carry on education and other activities from the 2003–05 ARA code of practice, with a target of reducing plastic bag use by 50 percent by the end of 2006, with further reductions depending on the availability of environmentally sustainable alternative carry bags (the ANRA proposal) (*ACG supplementary scenarios 1a and 1b)*
- Option O: as for Option N but with additional targets of a 10 percent year-on-year reduction in plastic bag use after 2006 (*ACG supplementary scenarios 2a and 2b*).

7.2. Impact analysis: methodology

7.2.1 ACG report to EPHC, Phasing out light-weight plastic bags: costs and benefits of alternative approaches

A cost-benefit analysis was undertaken of the eight hypothetical approaches proposed by EPHC and the baseline scenario listed above to address the problems associated with plastic bags. ACG examined the economic implications at a national and industry level using the MMRF-Green computable general equilibrium model of the Australian economy. The MMRF-Green model is built on data supplied by the Australian Bureau of Statistics, and complemented by data from other sources that provide further detail on the industry and production relationships within the Australian economy. ACG also considered supplementary information on plastic bag costs, consumption patterns and likely preferences for alternatives. In addition, ACG estimated the environmental impacts of each option.

Economic models are one tool used to keep track of price, production and tax relationships within an economy to ensure there is no double counting. Economic models are well suited to estimating the likely net impacts of policy changes at an economy-wide and industry level. The outcomes of the model are not an exact prediction of future outcomes of the implementation of a certain option – they are approximations best suited to indicating the signs (positive or negative), magnitude, and relativities of changes that are likely to be induced by a policy or economic 'shock'.

Many of the potential costs and benefits arising from action on plastic bags are not quantifiable. For this reason the analysis uses community willingness to participate in clean-up in order to develop approximate 'value' for environmental impacts rather than attempting to evaluate social impacts (e.g. cultural, community or educational benefits) arising from each option. In addition, ACG specifies the 'unquantifiable' benefits that would be required for each option if the environmental, social and economic costs were to be outweighed by the benefits. More information about the ACG methodology and findings can be found in the ACG report accompanying this RIS – *Phasing out light-weight plastic bags: costs and benefits of alternative approaches.*

Each costed option has also been modeled according to likely impacts on a range of key factors including:

- administration costs – for government and industry, and differentiated according to costs of overseeing a ban, point-of-sale suasive approach or levy
- training and staff costs – for retail staff involved in delivering new point-of-sale bag-handling arrangements
- theft – from retailers, associated with increased theft of shopping baskets or trolleys (based on the Irish experience with 'PlasTax')

- replacement bag sales – affecting consumers and manufacturers
- capital costs – affecting retailers who may need to install new equipment and processes.

Comment on assumptions used for modelling

The ACG assessment covers the cost of replacing both HDPE and LDPE bags.

The options modeled in this consultation RIS assume nationally consistent action. There is, of course, a possibility that some jurisdictions may choose different policy responses to the problem. Additional modelling would be required to show the impacts of different policy responses in different states, such as the impact on retailers operating across state boundaries (across different jurisdictions). If this were to occur, costs to governments and retailers would be likely to be significantly higher. Further industry behavioural assumptions are listed on page 56 of the ACG May 2006 report.

7.2.2 ACG report to DEH, ANRA proposal on plastic bag management: supplementary economic analysis to the EPHC report

In late May 2006, ANRA proposed a new retailer voluntary code of practice for plastic carry bags. This was subjected to cost-benefit analysis by ACG, to the extent possible in the short time available.

ACG's analysis of the ANRA proposal drew on and extended the earlier EPHC study results. While it did not use the MMRF-Green model to compute economic impacts, outputs from the EPHC exercise allowed estimates for supplementary options to be developed based on a combination of scaling and interpolation.

In order to facilitate comparison between the supplementary analysis and the original analysis, consistent methodologies, population growth and composition estimates, and behavioural assumptions consistent with the earlier work, were used. Aggregated and 'high-level' numbers (e.g. gross domestic product (GDP) impacts, environmental benefits, NPVs etc.) are most robust, while the initial, sectoral impacts (to retailers, households, and government) are provided for illustration.

More information about the methodology used in the supplementary analysis can be found in the ACG report to DEH, *The ANRA proposal on plastic bag management: supplementary economic analysis to the EPHC Report*, provided as an appendix to this RIS.

7.3. Litter focused options

This consultation RIS considers two approaches for directly targeting plastic bag litter: a broader litter management approach, elements of which are described below (Options A to D); and an Advance Disposal Fee (Option E).

7.3.1 General litter abatement to manage plastic bag litter

This section aims to present general options for consideration and comment as part of the consultation RIS. A specific litter strategy has not been presented and costed at this stage as litter abatement is a broad subject with many different facets. Local, state and territory governments, industry and not-for-profit organisations already spend significant funds on litter abatement

activities and strategies each year. A successful approach to address plastic bag litter would need to be tailored yet flexible enough to meet the needs of the region or jurisdiction in which it is applied.

Options A-D are presented as individual options however they might also be effective if introduced as part of a suite of approaches to reduce plastic bag litter. A broad litter strategy requires an integrated approach using a number of different measures – focusing on one measure is unlikely to be effective. The following measures may assist in achieving a reduction in litter if used as part of a coordinated framework:

- Improve the enforceability of litter offences (Option A)
- Increase penalties at State and local levels (although penalties may not be sufficient deterrents and if set too high may be open to legal challenge) (Option A)
- Increase public awareness of the penalties and impacts of litter (Option B)
- Target littering behaviour and increase enforcement activities (noting enforcement agencies would require appropriate resources and funding) (Option A)
- Provide appropriate waste management infrastructure (Option D)
- Maintain a clean environment – i.e. do not allow litter to accumulate (Option C).

Litter reduction campaigns, which can be comprised of a range of activities, should be frequent and repeated to ensure the desired behaviour change does not revert back to previous patterns.[94] Co-ordination and consistency in the anti-litter message is likely to be required across different communities and at a local level to maximise the effectiveness of the campaigns. The NSW experience with the "Don't be a Tosser" campaign showed that as soon as the level of education and awareness activity is reduced, litter levels start to increase again. This will have implications for resourcing an effective litter abatement campaign.

Option A: Enforcement

Option A considers whether enforcement activity can be used to reduce plastic bag litter. Each jurisdiction currently has broad litter-related legislation, providing penalties for various littering offences. Enforcement of these provisions is often undertaken by state and local government authorised personnel. The following table indicates the types and scale of fines for littering in each jurisdiction.

[94] *Educating the Community about Litter – Changing Knowledge, attitudes and behaviour* 2000-2003 (Department of Environment and Conservation 2005

Table 7.1: Litter offences and penalties by jurisdiction

NEW SOUTH WALES	Littering of small items General litter (including from vehicles) Aggravated littering (threat to public safety)	$60 $200 $375
VICTORIA	Littering of small items A range of littering offences Aggravated littering	$105 $210 (on the spot) $ 6446 (in court)
QUEENSLAND	On the spot littering fines	$150
WESTERN AUSTRALIA	Cigarette butts Discarding litter (streets, parks, picnic grounds, roadsides) Dangerous litter (glass)	$75 $200 $200
SOUTH AUSTRALIA	On the spot littering fines	$315
TASMANIA	On the spot littering fines	$100
AUSTRALIAN CAPITAL TERRITORY	On the spot littering fines	Up to $200
NORTHERN TERRITORY	Littering fine	$50

By comparison, some other countries have more stringent litter offences and penalties. For example Singapore is renowned for its strict and effective laws on littering[95] and these can be compared to the examples of litter fines provided above. A fine for littering in the street in Singapore will be approximately S$1,000 ($828.03 AUD, exchange rate as at 28/11/06). This would be equivalent to an increase of nearly 500 percent on the average Australian litter fine.

However the way enforcement is undertaken is important. If the person who litters cannot be identified, no fine can be issued – meaning that the action of littering the plastic bag cannot be tied to any consequence such as a fine. Simply increasing fines alone may not have the desired effect and increasing enforcement would be very costly, meaning the effectiveness of such an approach would be questionable.

Questions for consultation

- **Are fines and similar penalties effective deterrents to litter?**
- **Would more severe litter penalties be an effective mechanism to manage plastic bag litter?**
- **What do you think about creating specific litter offences in relation to plastic bag litter?**
- **Do you have examples of other effective enforcement techniques to limit littering**?

Option B: Behaviour Change

This option considers the importance of behaviour in reducing plastic bag litter. Research into litter has found that littering behaviour is part of a complex phenomenon and people do not simply fall into stereotypical categories of being either 'litterers' or 'non-litterers'. This complexity demands behaviour change strategies that take a variety of factors into account as simple solutions in isolation, such as the issuing of fines, will not lead to sustainable long term changes. Effective programs must be based on research of the particular problem and include a mix of education, infrastructure and enforcement supported by incentives and communications.[96]

Inappropriate behaviour of some consumers results in plastic bags entering the litter stream: the Nolan-ITU 2002 report estimated that people may deliberately litter an estimated 30 to 50 million bags each year, compared with an estimated 20 to 30 million bags inadvertently littered during waste disposal. It is not possible to identify the people who litter - there is no known gender, age

[95] Mills, J. Financial Time *Magic of the Clock Work City* 16 November 2002

[96] *Community Change Measuring Environmentally Desirable Behaviour in Australia: Littering Behaviour Study III*. Beverage Industry Environment Council report. Pyrmont, Sydney 2001

or socio-economic differentiation in littering behaviour. A NSW EPA study, *Fast Life, Fast Litter*[97] found that there are several reasons why people litter such as laziness and a perception that litter is not an important environmental concern. In addition, large public events can also impact of people's littering behaviour, such as during a festival or on New Year's Eve.

Characterising why people litter would be an important component of any litter strategy for plastic bags and would be an essential part of effecting change. A NSW report indicated that people's littering behaviour is complex and can vary depending upon the individual context and that littering behaviour can also vary amongst demographic groups.[98] This report noted issues that are important when considering designing litter abatement activities. These included conducting surveys to identify people's total disposal behaviour (appropriate and inappropriate behaviours) and integrating litter surveys with sociological surveys of community characteristics. This information would enable the development of specific approaches to be as effective as possible.[99]

Education and awareness is also an important component of retailer and public behaviour change. The National Plastic Bags Working Group in 2002 suggested some activities to facilitate education and awareness. It should be noted that responsibilities for these activities would need to be shared between state and local governments, non-government organisations, industry organisations and the general public.

- All levels of government (national, state, and local) to increase support of consumer and retailer anti-litter awareness campaigns driven by non-profit organisations and community groups.
- Governments to investigate and initiate new litter abatement strategies, including ways of reviewing and improving local waste disposal measures, for example, the availability and style of bins in public places.
- Retailers and plastic bag manufacturers to brand their plastic bags to indicate the sources of plastic bags and to encourage appropriate disposal.
- Governments to consider developing a proposal for a coordinated national customer and retailer awareness programme that would:
    - Further promote the use of reusable bag alternatives
    - Promote marine and land-based anti-littering awareness
    - Encourage appropriate waste disposal behaviour
    - Target youth and community awareness through competitions and other initiatives
    - Facilitate the sharing of community and regionally specific ideas through national workshops and forums.

[97] http://www.epa.nsw.gov.au/litter/research.htm (Accessed 7/12/2006)
[98] Department of Environment and Conservation December 2005; *Educating the Community About Litter; Changing knowledge, attitude and behaviour p26.*
[99] Ibid.

Option C: Litter Clean Up

This option considers plastic bag clean up activities. As noted previously in this consultation RIS, a large proportion of plastic bag litter inadvertently enters the litter stream. Consequently, a comprehensive strategy that addresses litter, including plastic bags, would require a clean-up component. Local and state governments spend approximately $200 million annually on litter clean-up activities and private organisations such as Clean up Australia also substantially contribute to litter abatement efforts through events such as Clean Up Australia Day.[100] It has been shown that a litter free environment encourages better social behaviour and that an area that is already littered encourages littering behaviour and is linked with anti-social behaviour and crime.[101] Clean up efforts can be conducted at a local, regional and national level. These can be conducted through:

- Community groups and schools
- Business and organisations
- Local and state government initiatives.

Option D: Litter infrastructure

This option addresses access to and the use of public waste disposal facilities. People often use as an excuse for littering the fact that there were no bins, the bins were full or were not obvious. The provision of appropriately located and well maintained bins that are recognisable and accessible is an important factor in changing people's littering behaviour.

People with responsibility for designing and installing public litter bins may use bins that do not look like bins, but that blend into the surroundings. This makes it difficult for people to easily see the bin. Bin visibility and placement is important to encourage appropriate disposal of litter.

Beyond Plastic Bags

Plastic bags can be detrimental to the environment when littered as they are highly visible and mobile in a variety of environments. However they constitute less than two percent of the litter stream by number. Any litter strategy that aims to manage plastic bags litter, could also consider other potential environmental benefits that could be gained through more general litter abatement activities aimed at other litter priorities. For example, cigarette butt litter is detrimental to the environment as it releases harmful leachate when wet and butts have been found in the stomachs of marine animals. Cigarette butts constitute approximately 50 percent of the litter stream by number and this along with other priority litter issues, could easily be incorporated into litter abatement activities primarily aimed at removing plastic bags from the environment.

[100] Nolan ITU 2002 page 8

[101] http://www.dca.state.ga.us/environmental/kgb/whats_the_problem.html

Questions for consultation

- **Are there other measures that could be incorporated into a plastic bag litter strategy?**
- **How often or should organised clean-up campaigns occur in your local area or nationally to manage plastic bag litter?**
- **Who should fund such clean-ups?**
- **What form of litter campaign would be effective in the specific context of plastic bags?**
- **What form of litter campaign would be effective in the specific context of plastics and other litter?**
- **What combination of options A-D would be most effective as a litter strategy?**
- **Do you have any quantitative information, for example on the costs and effectiveness of options A – D, either individually or combined?**

Option E: Advance disposal fee (ACG scenario 7)

Description and assumptions

Advance disposal fees (ADFs) are designed to generate funds that are used to pay for the clean up or management of products at the end of life. An advanced disposal fee on plastic bags would provide a mechanism for raising the funds that will be used to address the impacts of plastic bag litter.

Advance disposal fees are not widespread in Australia although they have been applied overseas to products such as televisions and recyclable packaging materials. An example of an ADF within Australia is an ADF of $0.04 applied per litre or kilogram of chemical in the DrumMuster programme. This funds the collection and recycling of non-returnable agricultural and veterinary chemical containers.

An ADF may be applied:

- at the first point of sale of the plastic bag, i.e. where the wholesaler, importer or manufacturer first sells the bag either to a wholesaler to on-sell or to the retailer, or
- at the retail level when the bag is provided to the customer. Where the retailer is also the importer, the ADF would apply on provision of the bag to the consumer.

The ADF would be applied only once in the supply of the plastic bag. If it is applied at the wholesale level, it could not then be applied at the retail level.

In principle, the level of the fee must be set at the cost of plastic bag disposal. Monies received could be deposited into a central fund to be used for the management of plastic bags, such as recycling research and development, collection infrastructure and litter abatement measures. Administration of the fund would need to be determined..

Each jurisdiction could enact ADF legislation which might include:

- the identification of eligible plastic bags for the application of an ADF
- registration of businesses with the appropriate jurisdiction (e.g. where the head office is located) and application of a registration fee
- the establishment of an ADF collection fund
- who the fee is collected from (e.g. the first in-state purchaser of the bag or the retailer supplying the bag)
- reporting and acquittal requirements
- enforcement and monitoring measures to ensure payment to the fund

- penalties for a range of non-compliance issues.

Adoption of this option may see some reduction in the number of plastic bags used although this would be expected to be comparatively small[102]. Also as people become use to the charge, a bounce-back effect is likely to be noted, particularly if plastic bags are still offered. From a legal perspective, the Australian Competition and Consumer Commission (ACCC) would need to be consulted regarding *Trade Practices Act 1974* implications of a proposed ADF.

With an ADF, plastic bags would remain in use and the consumer would choose whether to pay the additional cost of using a plastic bag over an alternative. It would however provide a fund for addressing the impact of those bags littered.

For constitutional reasons, for an ADF to be put in place by state or territory governments, the fee under an ADF scheme must be strictly related to the costs associated with the management of plastic bags at the end of their intended use. In practice, this may lead to differential pricing between and even within jurisdictions as the ADF depends on the disposal and management cost. Depending on how the fee is handled by retailers, it may or may not be passed on to consumers.

The application of an ADF may also send a signal concerning the 'acceptability' of plastic bag use. That is, there is the risk that consumers could justify their use because there would be an implied management option. Further, consumers may increase the littering of plastic bags because they believe that they have paid for the clean-up of bags. This means that continuing education and awareness programmes supported by government and coordinated by various non-government organisations would be required. Positive impacts on litter would depend on the design and implementation of an effective plastic bag litter-management strategy funded by the ADF.

Significant government resourcing would be required to establish fee levels, to determine how fees are collected, as well as to manage and enforce collections. Significant parallel effort is required from companies who must track the supply of the product attracting the ADF (in this case, plastic bags) and remit the appropriate fees.

Under this option, litter clean-up bodies would be paid from the funds collected.

Option E: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[103]

Timing

- additional fee of $0.02[104] applied by retailers to recover the cost of an effective plastic bag disposal initiative, from 1 January 2009 (lifting the price of bags to $0.05)

Industry

[102] ACG Report May 2006 p 53
[103] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, pp. 60-61
[104] Currently, an estimated $4 million spent on cleaning plastic bags, which gathers 20 million of the estimated 60 million littered. To clean up the remaining 40 million, assuming a decreasing marginal return on effort, is estimated to cost an additional $56 million. $60 million required, need roughly $0.02 per plastic bag for 4 billion bags currently consumed.

- one-off costs to all retailers in 2009 of $187 million
- ongoing costs to all retailers caused by increased transaction times and/or administration costs (starting at $58 million in 2009 and linearly declining to $55 million in 2019 to capture improved administrative efficiency)
- ongoing costs to retailers associated with in-store education and promotion (starting at $10 million in 2009 and linearly declining to nothing by 2019)
- all other impacts modelled by MMRF-Green

Households

- 50 percent reduction in the consumption of plastic bags from 2009 onwards at $0.03 per plastic bags ($71 million in 2009)
- offset by increases in the amount spent on plastic bags at the charged price, 50 percent of plastic bags at an additional $0.02 per plastic bags ($47 million in 2009)
- re-useable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each re-useable, at $1.40 per re-useable ($25 million in 2009)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone, at a replacement rate of one for one, at $0.15 per bag ($18 million in 2009)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone at a replacement rate of one for seven, at $0.05 per bin liner ($18 million in 2009)
- all other impacts modelled by MMRF-Green

Government

- ongoing costs conservatively estimated at 0.1 full-time equivalent employee for administration and monitoring non-compliance for each jurisdiction (nine jurisdictions at $11,000 each, totalling $99,000)
- reduction in expenditure on litter clean-up for stray plastic bags ($2 million in 2009)
- increased income from fee, less cost of collecting the fee (assumed 8 percent of amount collected or $44 million in 2009)
- all other impacts modelled by MMRF-Green

Findings

Costs and benefits (compared to 'no further government action' option)

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$181.48	-$767.95	-$586.47	$586.47	300.5 million

5 The ACG analysis found that the benefits of implementing an ADF on plastic bags would equate to $181.48 million in net present value terms over the period from 2005 to 2016. Costs identified would be $767.95 million over the same period.

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $586.47 million over the period before this option provides an improvement in social welfare.

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further government action' option.

Bag consumption	20,732.5 million fewer bags would be consumed
Plastic bag litter	300.5 million fewer plastic bags would be littered
Value of environmental benefits	$181.5 million in NPV terms

Economic impacts:

- Over the period, GDP will be $767.9 million less under this option when compared with GDP achieved under the 'no further government action' option.
- Over the period, retailers face net costs $433.9 million greater than under the 'no further government action' option. When compared to Option F, this option results in a loss to value added for the retail industry of $36.4 million, a loss to value added for the plastic products industry of $36.3 million, and a gain to value added for the paper industry of $12.8 million.
- Household income is $544.8 million less over the period, including an initial economic cost of $195.5 million.
- Governments also have a cost of $10.8 million when compared to the 'no further government action' option.

Implications

In summary, an ADF provides for government administration and litter management. Social benefits to consumers are in the form of consumers having access to bags while at the same time being able to recoup the money saved by refusing a bag. By retailers applying a fee, money is put aside for future litter and waste management activities.

The ADF option gives a low result in terms of litter reduction. In addition, it would be unlikely to result in a significant change in plastic bag consumption behaviour because the cost of the ADF would be too low to drive behaviour change.

7.4. Plastic Bag Consumption Focused Options

Option F: Baseline scenario – no further government action (ACG scenario 2)

Description and assumptions

The baseline option against which all other options are compared is that no new arrangements are put in place following the expiry of the ARA code on 31 December 2005.

Under this option, there would be:

- no extension of the ARA code
- no replacement voluntary industry arrangement
- no requirement that any retailers maintain any of the actions already implemented under the ARA code

- governments do not implement regulations to maintain existing or compel further bag use reductions
- no alternative approach is adopted targeting plastic bag litter.

There would be some ongoing plastic bag obligations on brand owners and signatories to the National Packaging Covenant but, as discussed, these obligations are not onerous and they exempt a large number of organisations that are using plastic bags. Current government anti-litter regulations would continue with the same level of enforcement, and the activities of non-government organisations such as Keep Australia Beautiful and Clean Up Australia would continue.

Effectively, this option would see efforts to reduce plastic bag use limited to voluntary measures by motivated consumers and a few proactive organisations. Under this option it was assumed that voluntary efforts initiated under the ARA code would cease and the consumption of plastic bags would increase over time.[105]

Option F (baseline): assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[106]

Timing:
- from 1 January 2006 (after expiry of ARA code)

Industry
- reduction for retailers of the costs of complying with the code (approximately $21 million annually)

Households
- continuation of 2005 plastic bag consumption levels, increasing gradually over time (2.5 percent annually) based on the average rate of economic growth

Governments
- no change

Findings

Economic impacts

The economic impact of 'no further government action' is not explicitly depicted here, as this represents the baseline option against which other options are compared.

ACG found the following:

Under Option F, Group One retailers no longer incur the estimated annual cost of $21 million currently necessary to comply with the ARA code. That is, 'no further action'

[105] ACG Report May 2006 p 27.
[106] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing out light-weight plastic bags: costs and benefits of alternative approaches*, *p.57*

results in a direct economic benefit to those involved in administration of the ARA code, but the environment suffers because plastic bag consumption is no longer curtailed.[107]

Environmental impacts

In the period from 2005 to 2016, in the absence of further government action, it is estimated that 83.3 billion additional plastic bags will enter the waste stream. Of these, an additional 724.7 million are likely to become litter. It is assumed that the number of plastic bags entering the environment will grow each year at a rate of 2.5 percent due to the combined effect of a drift by consumers back to old habits, and population and economic growth.

Implications

In summary, the option of taking no further government action does not meet the objective of reducing the impact of plastic bags on the environment. Any social benefits derived from bags being available will detract from the potential increase over time of bags as litter in the environment. However, retailers will incur no further costs associated with the ARA code. Without a supporting framework for plastic bag reductions, including reduction targets, it is unlikely that additional action would be taken by non-supermarket retailers to reduce plastic bag consumption.

Option G: Extension of the voluntary code of practice for managing plastic bags (ACG scenario 3)

Description and assumptions

This option charts the likely implications of extending current arrangements, with no further change.

The modelling for this option assumes that all Group One retailers currently involved in activities under the ARA code would continue their engagement, and that the code would be extended to 50 percent of Group Two retailers. As explained in section 6.3 above, the ARA code predominantly focused on actions for Group One retailers, with minimal requirements for action by Group Two retailers.

It should be noted that there has been no discussion to date by governments or retailers of the possibility of extending current arrangements without amendment.

> ***Option G: assumptions***
> For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[108]
>
> *Timing*
> - ARA code extended from 1 January 2006
> - Group One signatories to the ARA code maintain 50 percent reduction (based on 2002 figures)
> - coverage of ARA code extended to 50 percent of Group Two retailers

[107] ACG, Report May 2006 p.28
[108] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, pp. 57-58

Industry

- one-off cost of $100 million to retailers not currently part of the ARA code
- ongoing costs of $9 million annually to retailers not currently part of the ARA code, caused by increased transaction times and administration costs
- ongoing costs to retailers of $22 million annually associated with in-store education and promotion
- no costs to retailers associated with administration
- all other impacts modelled by MMRF-Green

Households

- approximately 50 percent reduction in the consumption of plastic bags from 2006 onwards, at $0.03 per plastic bags (reduction in expenditure $68 million in 2006)
- reusable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each reusable bag, at $1.40 per re-usable (costing $24 million in 2006)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone, at a replacement rate of one for one, at $0.15 per bag (costing $17 million in 2006)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone, at a replacement rate of one for seven, at $0.05 per bin liner (costing $17 million in 2006)
- all other impacts modelled by MMRF-Green

Government

- ongoing costs conservatively estimated at 0.1 full-time-equivalent staff member for administering the ARA code and monitoring compliance for each jurisdiction (nine jurisdictions, at $11,000 each, totalling $99,000)
- reduction in expenditure on litter clean-up for stray plastic bags ($2 million in 2006)
- all other impacts modelled by MMRF-Green

Findings

Costs and benefits compared to 'no further action' option

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$156.34	-$646.01	-$489.67	$489.67	233.2 million

5

The ACG analysis found that the benefits of extending the ARA code would equate to $156.34 million in net present value terms over the period from 2005 to 2016. Costs identified would be $646.01 million over the same period.

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $489.67 million over the period before this option provides an improvement in social welfare.

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further action' option.

Bag consumption	26,815.2 million less plastic bags would be consumed
Plastic bag litter	233.2 million less plastic bags will enter the litter stream o While the number of plastic bags entering the environment is less than under the 'no further action' option, large numbers of plastic bags continue to make their way into the environment and this number increases through time as plastic bag consumption increases i.e. as litter accumulates.
Value of environmental benefits	$156.3 million greater than the 'no further government action' option.

Economic Impacts

- Over the period, GDP will be $646 million less under this option when compared against GDP achieved under the 'no further government action' option.
- Retailers will face net costs $329.6 million greater than under the 'no further government action' option. When compared to Option F, this option results in a loss to value added for the retail industry of $26.6 million, a loss to value added for the plastic products industry of $129.3 million, and a gain to value added for the paper industry of $31.6 million.
- Household income is $507.3 million less over the period, even though households get an initial economic benefit of $82.9 million under this option due to reduction in the consumption of bags.
- Governments get an economic benefit of $12.7 million when compared to the 'no further government action' option.

For further details of the impacts of this option please refer to the ACG report at Appendix A.

Implications

ACG found that while this option provides an environmental benefit when compared with the 'no further action' option, a large number of plastic bags continue to enter the litter stream, and the number of bags in the litter stream increases with plastic bag consumption. Under this option, households and then government would receive the greatest net benefit.

Option G will not deliver consistent industry-wide outcomes, as they are reliant on individual companies to introduce reduction initiatives. Although the modelling assumes that coverage of the ARA code would spread to include 50 percent of Group Two retailers, in actuality it is by no means assured that this would occur without a significant publicity effort by government and industry. Even then it is highly unlikely that the targets would be met. Therefore, the estimated cost for industry and the environment may be overstated.

If expansion of activity by smaller retailers does not occur, the ability of the option to meet the objective would be compromised. It is not expected that this target would be exceeded if the ARA code were extended. It should be noted that this option assumes expansion of the ARA code to 50 percent of retailers. However as the ARA code expired on 31 December 2005 and retailers have indicated a reluctance to continue with purely voluntary measures, it is unlikely that this option would receive much support.

Option H: Industry agreement to impose an escalating charge, supported by complementary regulatory measure (ACG scenario 4)

Description and assumptions

This option would apply to all retailers supplying plastic bags to the consumer at the point of sale of goods. Retailers supplying plastic bags who did not voluntarily apply a charge to the plastic bag would be subject to the requirements of the supporting complementary regulation.

It is expected that this arrangement could be similar to the existing National Packaging Covenant and NEPM framework where the regulatory measures would be aimed at non-participants to compel action that achieves equivalent outcomes to the voluntary measures (capturing free riders). For the purposes of this cost-benefit analysis, it is assumed that all retailers would participate in the charge.

Option H: assumptions

For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[109]

Timing

- plastic bag charge from 1 January 2007 at $0.05 per bag, $0.15 from 2008, $0.25 from 2009

Industry

- charge to be implemented by all retailers (universal coverage)
- one-off cost extending to all retailers in 2007 of $187 million
- ongoing costs to all retailers caused by increased transaction times and administration costs from $58 million in 2007, rising to $82 million in 2009 and then declining to $55 million in 2017
- ongoing costs to retailers associated with in-store education and promotion, starting at $10 million in 2007 and declining to nothing by 2017
- all other impacts modelled by MMRF-Green

Households

- approximately 50 percent reduction in the consumption of plastic bags in 2007, 80 percent reduction in 2008 and 100 percent reduction in 2009, at $0.03 per plastic bag ($68 million in 2007, $111 million in 2008, and $142 million in 2009)
- offset by increase in the amount spent on plastic bags at the charged price, 50 percent of plastic bags at an additional $0.02 per plastic bags, 20 percent of plastic bags at an additional $0.12 per plastic bag. No expenditure on

[109] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p. 58

plastic bags from 2009 onwards
- reusable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each reusable, at $1.40 per reusable ($24 million in 2007, $39 million in 2008, and $50 million in 2009)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone at a replacement rate of one for one, at $0.15 per bag ($17 million in 2007, $28 million in 2008, and $36 million in 2009)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone, at a replacement rate of one for seven, at $0.05 per bin liner
- all other impacts modelled by MMRF-Green

Governments
- ongoing costs of 0.1 full-time equivalent employee for administration and monitoring compliance for each jurisdiction (nine jurisdictions at $11,000 each, totaling $99,000)
- reduction in expenditure on litter clean-up for stray plastic bags ($2 million in 2007, $3 million in 2008, and $4 million from 2009 onwards)
- all other impacts modelled by MMRF-Green

Findings

Costs and benefits of option

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$266.28	-$1293.1	-$1026.80	$1026.80	418.4 million

The ACG analysis found that implementing an escalating charge on plastic bags would provide a benefit of $266.28 million in net present value terms greater than the 'no further government action' option over the period from 2005 to 2016. However, the analysis also found that costs would be $1293.1 million greater over the same period when compared to the 'no further government action' option.

A number of benefits from implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $1026.80 million over the period before this option would be result in an improvement in social welfare.

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further action' option.

Bag consumption	47,428.4 million fewer bags would be consumed
Plastic bag litter	418.4 million fewer plastic bags would be littered
Value of environmental benefits	$266.3 million dollars over the period in NPV terms

Economic Impacts:

- Over the period, GDP will be $1293.1 million less under this option when compared against GDP achieved under the 'no further government action' option.
- Over the period, retailers face net costs $663.4 million greater than under the 'no further government action' option. When compared to Option F, this option results in a loss to value added for the retail industry of $53 million, a loss to value added for the plastic products industry of $68.7 million, and a gain to value added for the paper industry of $48.6 million.
- Household income is $529 million less over the period, even though households get an initial economic benefit of $1.6 million under this option due to reduction in the consumption of bags.
- Governments also receive a benefit of $23.1 million when compared to the 'no further government action' option.

Further details of the impacts of this option are included in the ACG report at Appendix A.

Implications

This option has been modelled as an escalating, nationally consistent, universal charge on plastic bags. In actuality, it is likely that a voluntary charge put in place with 'free rider' coverage and a supporting regulation may not be universal, if retailers choose to be covered by the supporting regulation rather than opting to implement a levy. Care would be required in setting up the scheme if it were desired to set uniform charges.

ACG found that this option has the greatest impact on GDP because it is one of the first to come into effect, and has one of the highest up-front costs.[110]

The initial high costs of this option are due to the administrative arrangements for retailers and governments surrounding the implementing of levies and charges, and the expenditure by retailers on in-store education and promotion. As improvements are made in administrative efficiency and consumer behaviour, expenditure on these activities falls over time. It was also found that while this option had a higher economic cost as compared to other options, it was one of the most effective at reducing the number of plastic bags consumed.[111]

While the ACG report indicates that plastic bag consumption will be close to zero in 2009 at a charge of $0.25, this may not in fact be the case. It is likely that a small proportion of consumers will pay the $0.25 charge per bag for the convenience of having a bag available at the store whenever they go shopping. It is also likely, however, that because the plastic bag has now been paid for in a similar transaction to any other good purchased, this bag has less potential to be deliberately littered and will instead be used for other secondary purposes after the primary transport function. However, these remaining bags may still have inadvertent litter potential when they end up in landfill or bins.

There may be an expectation that governments would provide some form of assistance to small businesses to offset the cost of implementation, which is not considered in the modelling. Another alternative is the provision of an exemption similar to the threshold for small businesses under the National Packaging Covenant. This threshold exempts businesses with annual turnover below a

[110] ACG Report May 2006, pg 31
[111] ACG Report May 2006, Figure 4.7, pg 35

specified amount from action under the supporting National Environment Protection (Used Packaging Materials) Measure. However if exemptions are created, more plastic bags will remain in the system (and consequently in the litter stream) than has been assumed under this option, as small businesses consume a significant proportion of plastic bags in Australia.

In summary, implementing an industry agreement to impose a voluntary charge, supported by a complementary regulatory measure, has a number of associated impacts such as administrative costs for government and industry, training and staff costs for retailers, possible increased amounts of theft from retail shops (such as trolleys), and a cost to consumers to either pay the voluntary charge or purchase reusable bags.

It was found however, that environmental benefits do rise in line with economic costs. It is these more expensive policy options that are the most effective at reducing the number of plastic bags consumed, and have the potential to result in a drop in the number of plastic bags littered.

Option I: Industry agreement to phase out, followed by government regulation to restrict the supply of plastic bags (ACG scenario 5)

Description and assumptions

This was the option being pursued by retailers and governments during 2005. However, the lack of support from major retailers means that this is now more a theoretical than likely option. Note that under this theoretical option, economic modelling assumes that action would have started in January 2006. As this consultation RIS will be released in 2007, the reader is therefore invited to read '2006' as 'year 1' of the voluntary phase out period. While theoretical and now dated, the option has been included to inform the debate on the relative costs of different approaches.

This option would apply to all retailers supplying plastic bags. It consists firstly of voluntary industry action, developed through a voluntary phase-out agreement from 2006 to 2008.[112] The voluntary phase-out agreement would then be followed by government regulation from 1 January 2009 to further restrict the supply of plastic bags by all retailers.

The phase-out agreement could replace the ARA code as a schedule under the National Packaging Covenant. If this occurs, it would be supported by regulation in the form of the National Environment Protection (Used Packaging Materials) Measure from 2006 to 2008.

After 2008, the regulation to restrict the supply of plastic bags may take another form. For example, regulation to restrict the supply of plastic bags may include:

- stringent reduction targets to be achieved over time for various levels of retailers
- requirements for retailers to undertake extensive education and awareness campaigns for customers
- requirements for the development of an employee training programme to facilitate a reduction in plastic bag usage
- requirements for retailers distributing plastic bags to contribute to an environmental fund to assist in plastic bag reduction programmes among small retailers, contribute to the purchase of alternatives or research into alternatives best suited to a particular group of

[112] Draft Industry Agreement to Phase Out Lightweight Single Use Plastic Carry Bags, 2006 http://www.nra.net.au/portal/images/stories/Pdf/plastic_bag_agreement_draft_10_nov.pdf (accessed 28/11/06)

retailers, or contribute to a rebate scheme for consumers who may not be able to afford to purchase alternatives or who do not have easy access to a range of options.

Under the November 2005 draft phase-out agreement, some retailer representatives sought the development of supportive legislation to eliminate plastic bags from January 2009. The draft agreement proposed the continuation of the phase-out actions and reporting established under the ARA code, but without specific reduction targets. The main concern of retailers with the draft agreement was that in the absence of a regulatory safety net, the cost implications of reducing plastic bags would still have been borne solely by participating retailers (as with the ARA code). This is particularly relevant for retail sectors where there is high competition and low retail margins.

Under this option, regulation would be introduced in 2009 compelling retailers to reduce plastic bag supply. It would allow a significant time lag between voluntary and mandatory action. There are a number of issues raised by this option. There is the possibility that retailers might make little additional headway between 2006 and 2008, waiting until just before 2009 to instigate further action (the draft agreement contained obligations for signatories that included implementation of an action plan to progressively phase out lightweight plastic carry bags before 31 December 2008 and annual reporting to the National Packaging Covenant Council.)

If introduced, this option would need to clearly define which plastic bags are subject to phase-out. For example, lightweight plastic bags used for purposes of food safety or hygiene (e.g. bags on a roll, produce bags, fruit and vegetable bags) would be exempt from the phase-out. However, the restriction would apply to all plastic bags supplied at the point of purchase of goods.

There would be two potential stages associated with implementing this option:

Stage 1 – industry agreement to phase out plastic bags between 2006 and end 2008:

- This could be implemented either as a stand-alone agreement or appended to the National Packaging Covenant. If the agreement were appended to the covenant, clarification would need to be sought as to whether the covenant and NEPM arrangement would require amendment.

Stage 2 – subsequent national legislation to restrict the supply of plastic bags from 1 January 2009:

- Development of the national regulation will depend on what regulatory arrangements are possible. This may include such tools as a ban, price signal or take-back requirements.
- Enforcement responsibility may also be an issue depending on the type of regulatory tool chosen.

An acceptable level for the phase-out target needs to be established and agreed. For instance, the phase-out level may be 90 percent of all plastic bags based on 2008 levels. This would mean, potentially, that all but the smallest suppliers would be required to find alternatives to the bags.

Option I: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[113]

[113] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p.59

Timing

- 2006–08: voluntary phase-out agreement
- 1 January 2009: regulation to eliminate plastic bags

Industry

- one-off cost to all retailers in 2006 of $187 million
- ongoing costs to all retailers caused by increased transaction times and/or administration costs, inversely related to plastic bag consumption ($15 million in 2007, increasing to $60 million in 2009)
- ongoing costs to retailers associated with in-store education and promotion (starting at $10 million in 2006 and linearly declining to nothing by 2010)
- no ongoing costs to retailers associated with administration
- all other impacts modelled by MMRF-Green

Households

- linear reduction in the consumption of plastic bags to zero between 2006 and 2009, at $0.03 per plastic bag ($35 million in 2006, $71 million in 2007, $107 million in 2008, and $142 million in 2009)
- reusable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each reusable bag at $1.40 per reusable ($13 million in 2006, $25 million in 2007, $38 million in 2008, and $50 million in 2009)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone, at a replacement rate of one for one, at $0.15 per 're-bag' ($13 million in 2006, $25 million in 2007, $38 million in 2008, and $50 million in 2009)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone, at a replacement rate of one for seven, at $0.05 per bin liner ($13 million in 2006, $25 million in 2007, $38 million in 2008, and $50 million in 2009).
- all other impacts modelled by MMRF-Green

Government

- ongoing costs conservatively estimated at 0.1 full-time equivalent employee for administration and monitoring compliance for each jurisdiction (nine jurisdictions, at $11,000 each, totalling $99,000)
- reduction in expenditure on litter clean-up for stray plastic bags ($1 million in 2006, $2 million in 2007, $3 million in 2008, and $4 million in 2009)

Findings

Costs and benefits (compared to 'no further government action' option)

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$270.61	-$1093.48	-$822.87	$822.87	422.4 million

The ACG analysis found that the benefits of an industry agreement to phase out plastic bags followed by regulation would equate to $270.61 million in net present value terms over the period from 2005 to 2016. Costs identified would be $1093.48 million over the same period.

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $822.87 million over the period before this option provides an improvement in social welfare.

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further government action' option.

Bag consumption	48,570.9 million fewer bags would be consumed
Plastic bag litter	422.4 million fewer plastic bags would be littered
Value of environmental benefits	$270.6 million in NPV terms

Economic impacts

- Over the period, GDP will be $1093.5 million less under this option when compared with GDP achieved under the 'no further government action' option.
- Over the period, retailers face net costs $563.9 million greater than under the 'no further government action' option. When compared to Option F, this option results in a loss to value added for the retail industry of $46 million, a loss to value added for the plastic products industry of $206.6 million, and a gain to value added for the paper industry of $50.4 million.
- Household income is $859.1 million less over the period, even though households get an initial economic benefit of $136.5 million under this option due to reduction in the consumption of bags.
- Governments also get a benefit of $23.9 million when compared to the 'no further government action' option.

Implications

As found with the escalating charge, while this option has a higher economic cost as compared to other options, it was one of the most effective at reducing the number of plastic bags consumed.[114] ACG also found that of all the options identified, Option I represented one of the most efficient trade-offs between economic and environmental costs.

If, under this option, a phase-out agreement formed part of the National Packaging Covenant, retailers with an annual turnover of $2 million or less may be exempt from the requirements to phase out plastic bags until the regulation is introduced in 2009.

In summary, under this option, the retail industry would be subject to a number of increased costs in terms of equipment modification for alternatives, staff training, and potentially, increased theft. Governments would have reduced clean-up expenses but would incur additional administrative costs. There may also be an expectation from some retailers that government would provide assistance in meeting the costs of introducing measures to phase out plastic bags.

[114] ACG Report May 2006, Figure 4.7, pg 35

It is expected that consumers would reduce the consumption of plastic bags as they became restricted between 2006 and 2009 and would increase consumption of reusable bags. This results in a social benefit for both consumers (in terms of clean open spaces) and hence a benefit to the environment, as fewer plastic bags would become litter.

Option J: Retailers obliged to impose a minimum charge by regulation (ACG scenario 8)

Description and assumptions

This option would apply to all retailers supplying plastic bags. Retailers would be required to apply a minimum charge to all plastic bags supplied. The intent is to allow the retailer to keep any revenue raised to use for whatever purpose they like.

Under this model, it is expected that any legislation may benefit from monitoring to ensure retailers apply a fair and reasonable charge if they chose to exceed the minimum charge, however where retailers are in competition for customers, this is expected to be managed by the market.

There is an impact on governments, retailers, and consumers by obliging retailers to impose a minimum charge for plastic bags. In addition to the costs borne by retailers to implement such a charge, governments would be obliged to ensure that the charge were implemented evenly across the board – in other words, to capture the possible free riders.

Option J: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[115]

Timing

- fee of $0.25 applied by retailers from 1 January 2009

Key assumptions:

- linearly interpreted from Option H (industry agreement to impose an escalating charge, supported by complementary regulatory measure).

Findings

Costs and benefits (compared to 'no further government action' option)

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$217.78	-$1035.12	-$817.34	$817.34	360.6 million

The ACG analysis found that the benefits of imposing a minimum charge on plastic bags would equate to $217.78 million in net present value terms over the period from 2005 to 2016. Costs identified would be $1035.12 million over the same period.

[115] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p. 61

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $817.34 million over the period before this option provides an improvement in social welfare.

Business Cost Calculator Findings

The following is an estimate of the annual cost to small, medium and large businesses for the implementation of a mandatory charge option. This estimate is based on the following assumptions some of which were used to inform the ACG reports. Please note that these are indicative only and are provided to inform the consultation process. The ACG analysis takes into account more impacts on costs and benefits, for example such as theft. Tables for considering the break down of costs under the ACG analysis can be view in Appendix C of the May 2006 ACG report.

Assumptions for small businesses:

- Approximately 64,505 business with approximately 321,964 employees
- Staff training of 4 hours at $18.00 an hour.
- Administration cost $50.00 per hour, 8 hours one day a year
- No cost incurred to modify equipment to cater for reusable bags
- Transaction times estimated with labour costs of $18 per hour ($0.005 per second)
    - A time increase of 5 seconds per transaction not using plastic bags and a current average of 2.5 bags per transaction.
- Small business allocate $100 to in-store promotion and education.

Assumptions for medium businesses:

- Approximately 3223 business affected with approximately 132,420 employees
- Staff training of 4 hours at $18.00 an hour.
- Administration cost $30.00 per hour, 24 hours over three days a year
- All medium business spend $3000 on modifications
- Transaction times estimated as above
- Medium businesses allocate $1000 to in-store promotion and education.

Assumptions for large businesses:

- Approximately 211 businesses affected with approximately 457050 employees.
- Staff training of 4 hours at $18.00 an hour.
- Administration costs $30.00 per hour, 40 hours over 5 days per year
- All Supermarkets spend $3000 on store modifications and 500 general merchandise and Other Retail stores spend $1500 on modifications
- Transaction times estimates as above
- Large business allocate $3000 to in-store promotion and education.

	Cost per small business	Cost per medium business	Cost per large business
Start-up	$320.00	$2893.93	$156,378.54
On going	$500.00	$3617.38	$153,978.18

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further government action' option.

Bag consumption	41,500 million fewer bags would be consumed
Plastic bag litter	360.6 million fewer plastic bags would be littered
Value of environmental benefits	$217.8 million in NPV terms

Economic impacts:

- Over the period, GDP will be $1035.1 million less under this option when compared with GDP achieved under the 'no further government action' option.
- Over the period, retailers face net costs $620.8 million greater than under the 'no further government action' option.
- Households get an initial economic benefit of $152.1 million under this option.
- Governments also get a benefit of $19.5 million when compared to the 'no further government action' option.

Implications

There may be an issue with allowing the retailer to use the revenue raised for whatever they like. Consumers are likely to expect the money to be used to fund re-use or recycling of plastic bags or assist in clean-up and litter prevention, meaning that transparency will be needed.

Another issue may be the lack of consistency in applying the charge. The charge set in regulation would be a minimum charge but some retailers may charge more. Consumers may, for the most part, have a choice in whether or not they accept the plastic bags and also in where they shop. However, this may not be the case for consumers in smaller communities where competition is less, or among groups who lack mobility or are economically disadvantaged.

In summary, where there is no obligation on retailers to provide an alternative and they simply charge a fee per plastic bag, issues of social equity may need to be considered. Retailers would incur costs for increased in-store transaction times and education. Householders would incur the cost of bin liners and the purchase of plastic bags but will also gain a monetary benefit by refusing a bag. Governments would face costs for administration and monitoring compliance, with reduced expenditure on litter clean-up. The environment would benefit from less bags being available as potential litter, creating a social benefit of improved environmental quality (aesthetics).

Option K: Impose a government levy on lightweight single-use plastic bags (ACG scenario 9)

Description and assumptions

Noting that the Australian Government has ruled out implementing such a measure, a levy could theoretically be applied to all plastic bags and could be collected by retailers when bags are supplied to the customer.

This option would be similar to the system applied in Ireland, where the government imposed a mandatory 15 Euro cents (A$0.27) plastic bag levy. This charge is paid by the consumer at the point of sale for every plastic bag issued.

If a similar scenario to Ireland's was chosen, this option may involve a regulation that includes:

- a charge to be applied at the point of sale in shops, supermarkets, service stations and all retail outlets that supply plastic bags
- a requirement that retailers pass on the full amount of the levy as a charge to customers at the checkout
- the charge for a plastic bag to be itemised on all invoices, receipts or dockets issued to customers
- the levy to be set at a specified amount (e.g. $0.10 per bag)
- exemptions from the levy be given for:
    - plastic bags that are used solely to contain:
        - fresh fish, meats and poultry products
        - fruit and vegetables
        - nuts, dried fruit and confectionary
        - dairy products
        - cooked food (hot or cold)
        - ice
    - plastic bags that are designed for re-use and are purchased by the customer for at least an amount equal to the levy
    - charity collection bags and other plastic bags that are provided for the purpose of being filled and returned to the supplier.
- administration and distribution of the levy by governments
- retailers keeping records that are able to be reported to governments
- penalties for non-payment or non-compliance, and guidelines for addressing issues involving under-payment
- appeal rights for retailers and management of complaints against retailers
- enforcement by authorised officers.

This option differs from an advance disposal fee in that the levy does not have to be set to reflect the cost associated with clean-up or management of plastic bags. This means that the levy can be set at a level commensurate with a charge that would be most likely to deliver significant plastic bag-use reduction. Monies from the levy would be retained by governments. Retailers may have concerns regarding the administration costs of collecting and disbursing the levy to government but there is potential for a proportion of the levy raised to be used to cover retailer costs associated with collecting the levy.

This option may not completely eliminate plastic bags, although there would potentially be funding available for the implementation of management options, and consumer education and awareness programmes about the impacts of plastic bags. This would require a policy decision by the government collecting the revenue to hypothecate revenue raised for environmental purposes. Without hypothecation, a levy is likely to be unpopular.

The quantum of the levy would need to be established and the price elasticity understood. The levy would need to be large enough to make the consumer think about whether they need the plastic bag or not – or whether alternatives such as reusable bags are more attractive. For example, if a reusable bag costs $1.00 and, on average, a reusable bag replaces four plastic bags, then the levy would need to be in the order of $0.25 per bag.

It should be noted that consumers may become conditioned to paying the levy and the size of the levy may need revision over time to remain effective. Such is the case in Ireland where the Plastax has been increased from 15 to 22 eurocents (from $0.25 to $0.37 AUD[116])[117].

Option K: assumptions

For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[118]

Timing

- plastic bag levy of additional $0.07 (total charge paid by consumer is $0.10 with the cost of the bag included) applied at the point of sale from 1 January 2009.

Industry

- one-off cost to all retailers in 2009 of $187 million
- ongoing costs to all retailers caused by increased transaction times and/or administration costs (starting at $76 million in 2009 and linearly declining to $52 million in 2019 to capture improved administrative efficiency).
- ongoing costs to retailers associated with in-store education and promotion (starting at $10 million in 2009 and linearly declining to nothing by 2019).
- all other impacts modeled by MMRF Green

Households

- 80 percent reduction in the consumption of plastic bags from 2009 onwards, at $0.03 per plastic bag ($114 million in 2009).
- offset by increase in the amount spent on plastic bags at the charged price, 20 percent of plastic bags at an additional $0.07 per bag ($66 million in 2009)
- reusable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each reusable, at $1.40 per reusable ($40 million in 2009)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone, at a replacement rate of one for one, at $0.15 per bag ($28 million in 2009)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone, at a replacement rate of one for seven, at $0.05 per bin liner ($28 million in 2009)
- All other impacts modeled by MMRF-Green

[116] Exchange rate calculated on 19 September 2006

[117] Treacy Hogan, "More for plastic bags" 29 August 2006, *The Irish Independent*. "Before the levy was introduced we each used 328 bags every year. This fell dramatically to 21 per capita after the levy but has now creeped back up to 30 bags each this year.

[118] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p. 61

Government

- ongoing costs of 0.1 full-time-equivalent employee for administering the code and monitoring compliance for each jurisdiction (nine jurisdictions, at $11,000 each, totaling $99,000).
- reduction in expenditure on litter clean-up for stray plastic bags ($3 million from 2009)
- increased income from levy, less cost of collecting the levy (assumed 8 percent of amount collected or $61 million in 2009)
- all other impacts modeled by MMRF-Green.

Findings

Costs and Benefits (compared to no further action option)

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$188.74	-$900.03	-$711.29	$711.29	312.5 million

The ACG analysis found that the benefits of imposing a government levy on plastic bags would equate to $188.74 million in net present value terms over the period from 2005 to 2016. Costs identified would be $900.03 million over the same period.

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $711.29 million over the period before this option provides an improvement in social welfare.

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further government action' option.

Bag consumption	33,172.0 million fewer bags would be consumed
Plastic bag litter	312.5 million fewer plastic bags would be littered
Value of environmental benefits	$188.7 million in NPV terms

Economic impacts:

- Over the period, GDP will be $900 million less under this option when compared with GDP achieved under the 'no further government action' option.
- Over the period retailers face net costs $511.2 million greater than under the 'no further government action' option. When compared to Option F, this option results in a loss to value added for the retail industry of $43.4 million, a loss to value added for the plastic products industry of $55.7 million, and a gain to value added for the paper industry of $23.9 million.
- Household income is $636.4 million less over the period, including an initial economic cost of $262.8 million under this option.
- Governments also bear a cost of $12.9 million when compared to the 'no further government action' option.

Implications

In summary, retailers would be subject to increased costs for administration, in-store education and promotion, though this would be reduced over time. Government would have increased administration costs but reduced litter costs. Household income falls (relative to the 'no further action' option), but there is an environmental benefit from reduction in litter.

Under this option, the consumer decides the worth of the convenience of having plastic bags available and makes a choice as to whether to pay the per-bag levy or use an alternative. There may be some consumers who choose to absorb the cost of the levy in order to retain the convenience, while other consumers will avoid plastic bag use.

Option L: Elimination of plastic bags from 2009 (ACG scenario 1)

Description and assumptions

This option would come into effect from 1 January 2009. It would provide a regulatory framework for the elimination of plastic bags.

The ban would not apply to the plastic bags in circulation prior to its introduction. It would only apply when current plastic bag stocks held by retailers required replacement. The ban would also not apply to the customer wishing to re-use the plastic bags that they had received from the retailer prior to the introduction of the ban.

In terms of enforcement, a ban applied at the import and manufacturing stage would be less complex to administer than a ban at the retail end, as there are a smaller number of importers and manufacturers. However, it would also mean greater involvement by Australian Customs officials in enforcing the ban on products entering the country. It could be impractical to require that all shipping containers be searched for plastic bags. It could also be impractical to enforce at the retail level in terms of capturing those retailers not complying with the ban.

For simplicity, any exemptions would need to be kept to a minimum and would relate to those areas where plastic bags are necessary to ensure the integrity of the product purchased (for example, for food safety or hygiene reasons).

The plastic bag manufacturers' industry association has signalled that some structural adjustment or support from government may be required.

Determination would be required of how, and by whom, the ban would be enforced and likely compliance costs associated with this option. It would also be necessary to determine when the ban would take effect. For the purposes of modelling, the ban has been modelled as commencing on 1 January 2009.

There may be a policy challenge in putting a product like plastic bags in the same status as illicit drugs, hazardous chemicals and other banned goods.

Option L: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[119]

Timing

- comprehensive ban from 1 January 2009

Industry:

- one-off cost to retailers of $187 million ($65 million for staff training, $120 million for increased theft, and $1.7 million to modify equipment to cater for plastic bag substitutes
- ongoing costs to retailers caused by increased transaction times and administration costs of $60 million annually
- no costs to retailers associated with in-store education and promotion
- no cost to retailers associated with administration

Households

- 100 percent reduction in the consumption of plastic bags from 2009 onwards, at $0.03 per plastic bag ($142 million in 2009)
- reusable bags consumed as substitutes for 95 percent of plastic bags foregone, at a replacement rate of about 125 plastic bags for each reusable, at $1.40 per reusable ($50 million in 2009)
- paper bags consumed as substitutes for 5 percent of plastic bags foregone, at a replacement rate of one for one, at $0.15 per bag ($36 million in 2009)
- bin liners consumed as substitutes for 100 percent of plastic bags foregone, at a replacement rate of one for seven, at $0.05 per bin liner ($36 million in 2009)
- all other impacts modelled by MMRF-Green

Government

- reduction in expenditure on litter clean-up for stray plastic bags ($4 million)
- ongoing costs of 0.1 full-time equivalent employee for administration and monitoring for each jurisdiction (nine jurisdictions at $11,000 each, resulting in a total of $99,000)
- all other impacts modelled by MMRF-Green.

Findings

Costs and benefits (compared to no further action option)

Benefits (NPV, $m)	Costs (NPV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$217.78	-$1057.08	-$839.30	$839.30	360.6 million

[119] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p. 56

The ACG Analysis found that the benefits of implementing a ban on plastic bags would equate to $217.78 million in net present value terms over the period from 2005 to 2016. Costs identified would be $1057.08 over the same period.

A number of the benefits of implementing this option (such as social benefits) have not been quantified. According to the ACG analysis, these unquantified benefits would need to be greater than $839.30 million over the period before this option provides an improvement in social welfare.

Business Cost Calculator Findings

The following is an estimate of the annual cost to small, medium and large businesses for the implementation of a ban option. This estimate is based on the following assumptions some of which were used to inform the ACG reports. Please note that these are indicative only and are provided to inform the consultation process. The ACG analysis takes into account more impacts on costs and benefits, for example such as theft. Tables for considering the break down of costs under the ACG analysis can be view in Appendix C of the May 2006 ACG report.

Assumptions for small businesses:

- Approximately 64,505 businesses with approximately 321,964 employees
- Staff training of 4 hours at $18.00 per hour.
- No cost incurred to modify equipment to cater for reusable bags or administration costs.
- Transaction times estimated with labour costs of $18 per hour ($0.005 per second)
    - A time increase of 5 second per transaction not using plastic bags and a current average of 2.5 bags per transaction.
- Small businesses allocate $100 to in-store promotion and education.

Assumptions for medium businesses:

- Approximately 3223 businesses affected with approximately 132,420 employees
- Staff training of 4 hours at $18.00 an hour.
- All medium business spend $3000 on modifications
- Transaction times estimated as above.
- Medium business allocate $1000 to in-store promotion and education.

Assumptions for large businesses:

- Approximately 211 businesses affected with approximately 457,050 employees.
- Staff training of 4 hours at $18.00 an hour.
- All Supermarkets spend $3000 on store modifications and 500 general merchandise and other retail stores spend $1500 on modifications
- Transaction times estimates as above
- Large business allocate $3000 to in-store promotion and education.

	Cost per small business	Cost per medium business	Cost per large business
Start-up	$420.00	$2893.93	$160,077.04
On going	$233.52	$2897.38	$152,778.18

Other key findings

Environmental impacts

The following table shows the impacts of this option over the period from 2005 to 2016 compared with the 'no further government action' option.

Bag consumption	zero new bags after 1 January 2009
Plastic bag litter	360.6 million fewer bags would be littered
Value of environmental benefits	$217.8 million in NPV terms

Economic impacts

- Over the period, GDP will be $1057.1 million less under this option when compared with GDP achieved under the 'no further government action' option.
- Over the period, retailers face net costs $432.9 million greater than under the 'no further government action' option.
- Households get an initial economic cost of $109.8 million under this option.
- Government also bear a cost of $19.0 million when compared to the 'no further government action' option.

Implications

In summary, a ban on plastic bags provides environmental benefits in terms of reduced litter and, in turn, provides a social benefit of enhanced environmental quality. Households would be forced to use reusable bags. Government will have reduced plastic bag litter clean-up costs, and retailers will incur initial costs for training staff and modifying equipment. Transaction times at the checkout will increase but retailers will also be able to sell alternative plastic bags to meet consumer needs.

There is a significant cost to government in enforcing the ban, with difficulty identifying and enforcing non-compliance. Environment protection agencies administer environmental protection legislation and regularly undertake audits of licensed premises for compliance with various conditions. Local government officers also undertake compliance inspections of premises. However, the likely number of retailers to whom the ban would apply may make 'normal' compliance enforcement prohibitive.

There may be an opportunity for governments to lessen the impact on householders by providing financial support for alternatives. For example, a number of states have been providing financial support to community campaigns that provide low cost options, including the ZeroWaste grants programme to reduce the use of plastic bags and the bag-free town programmes in New South Wales and Victoria. The cost of such support is not included in the modelling.

Consumer support for a total ban is unknown at this stage. Although recent community surveys appear to indicate community support for a ban, this may not be the case when the details of a proposed ban become known[120]. Consumers may decide that the convenience of being able to use a plastic bag when they need to, and pay for it through a charge, is more acceptable than no plastic bags and the need to remember to take alternatives all the time. Many people may also believe

[120] Clean Up Australia Newspoll survey in December 2006 stated that 84 percent of people surveyed were in favour of a ban on plastic bags.

that, although that they do not intend to use them, having plastic bags still available provides a safety net 'just in case'.

It should also be noted that a ban is a very 'blunt instrument' for achieving the objective of reducing the environmental impact of plastic bag litter. In practice, bans are generally reserved for those products that pose a significant risk to human health and the environment. Products that have been banned, such as dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs), have all had demonstrable, severe impacts on human health and the environment due to toxicity, persistence, and bioaccumulation.

Option M: A stand-alone ban on lightweight single-use plastic carry bags (ACG scenario 6)

This option is the same as Option L, but with different timing (Option L assumes introduction from 1 January 2009). Hence, the principal difference is the start date. This option was modelled to provide information on the cost implications of bringing forward action as a result of policy imperatives. To bring the start date forward one year would bring the cost up to $944.2 million.[121]

Industry proposal for a new voluntary code

In late May 2006, ANRA announced its intention to develop a voluntary code of practice for plastic bags. This is likely to be the main voluntary proposal from industry on this issue.

Formed in early 2006, ANRA's membership in June 2006 consisted at that time of Woolworths, Coles Myer, David Jones, Best & Less and Bunnings. It is understood that other major national retailers have indicated their intention to join. Of the current membership, the only Group One retailers (as defined by the ARA code) are Woolworths and Coles Myer.

The ANRA proposal has been endorsed by all existing ANRA members. It is understood that any future ANRA plastic bag code would be adhered to by all future ANRA members. In addition, the ANRA code would be open to retailers choosing to remain outside ANRA.

The major components of this proposal include:

- a commitment to reach the target of a 50 percent reduction in plastic bag use (against the 2002 baseline) by the end of 2006, compared to the actual 45 percent reduction achieved by the end of 2005
- further reductions to be dependent on the identification and adoption of an environmentally sustainable and commercially feasible biodegradable plastic bag, with a commitment to work to identify such a product
- a commitment to maintain actions from the ARA code including education, providing alternatives, in-store promotion, support for litter campaigns, etc.

The Allen Consulting Group was engaged to provide a supplementary analysis of variations of the ANRA proposal. Analysis of these options is provided below.

[121] Assumptions used for modelling purposes by Allen Consulting Group in report *Phasing Out Light-Weight Plastic Bags: Costs and Benefits of Alternative Approaches*, p. 39

Biodegradable bags

The availability of biodegradable bags is a core component of the ANRA proposal. Currently, there is uncertainty about the practicality and cost of bags from a retailer point of view, and the desirability of biodegradable plastics from a social and environmental point of view. Without prejudice to the view eventually taken by EPHC on biodegradable bags, it is reasonable to assume that widespread take-up of biodegradable bags by retailers will only be supported by governments if these difficulties are addressed.

For the purposes of comparison, ACG uses the following assumptions for costs and impacts for biodegradable bags. However, it should be noted that the cost of bags may alter with additional research into product types. The environmental impact of biodegradable bags as litter can alter dramatically according to the conditions in which the bag ends up, so the number provided is in the nature of a 'ball park' figure.

Assumptions used for biodegradable bags:

- cost: 10 cents per bag (assumed to be of equivalent carrying capacity to a HDPE plastic bag), relative to a cost of 3 cents per HDPE plastic bag
- environmental impact: 30 percent of that for a HDPE plastic bag, i.e. a littered biodegradable bag is likely to impose only 30 percent of the cost of a HDPE bag.

The key assumptions for the 'baseline' used in the supplementary ACG analysis are:

- governments maintain the current level of effort in terms of education, litter action and monitoring
- retailers maintain the current level of voluntary effort, and there are no new participants
- consumer bag-consumption patterns remain consistent with 2005 behaviour in terms of demand for plastic bags, reusables and other alternatives
- bag consumption grows at 2.5 percent a year, in line with assumed growth in retail turnover.

Option N: The ANRA proposal (ACG supplementary scenarios 1a and 1b)

Description and assumptions

The numbers of retailers signing up to a new ANRA code would depend on a number of factors, including the extent of 'free-rider' coverage. Such free-rider coverage may prompt ANRA to negotiate with governments to change the nature of the agreement from a purely voluntary to a co-regulatory approach.

Two variations on the ANRA proposal were considered. The significant difference between the variations concerned the assumed take-up by the retail sector.

Na) The 'high take-up' option (scenario 1a) assumes acceptance and achievement of targets by all Group One retailers plus all other retailers with an annual turnover greater than $5 million per year. Such a threshold would apply if the proposed ANRA code of practice were appended to the National Packaging Covenant.

Nb) For the purpose of this analysis, a 'modest take-up' option (scenario 1b) is projected, including all Group One retailers plus 25 percent of Group Two retailers, which as noted before, would involve a significant number of small retail businesses.

5 The number of participating retailers is a critical issue for the analysis. Much of this analysis depends on the participation of non-Group One retailers with turnover of greater than $5 million a year. Eligible retailers are assumed to account for 5 percent of all retailers by number, and around 70 percent of all plastic bags provided in 2005. The number is difficult to estimate precisely.

10 Without free-rider regulation such as that the regulation that underpins the National Packaging Covenant, take-up of the code is likely to be much lower, with moral persuasion and customer demand being the major drivers of sign-up to the code by non-ANRA members.

Option N: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[122]

Timing
- programme begins from 2006 (assume maintenance of infrastructure established under the 2003–05 ARA code)

Industry
- eligible retailers in each option reach their 50 percent target by the end of 2006
- all eligible retailers to switch to biodegradable bags from 2007 onwards
- following switch to biodegradables, all eligible retailers continue their promotion of reusable bags, education and awareness activities
- once the 50 percent reduction target is reached at the end of 2006, the total number of bags (either HDPE or biodegradable) grows at 2.5 percent per year

Households
- consumer consumption patterns remain as they were in 2005, in terms of demand for plastic bags, reusables, bin liners etc.
- retailers to pass on the full costs of biodegradable bags, so additional costs of more expensive bags are borne by consumers

Government
- ongoing costs in monitoring and administration.
  - 'modest take-up' option, estimated as the same as current efforts – conservatively estimated at 0.1 full-time equivalent employee for administration and monitoring compliance for each jurisdiction (nine jurisdictions at $11,000 each, totaling $99,000)
  - 'high take-up' option, assumed to involve one additional, full-time equivalent employee in each of the nine jurisdictions.
- reduction in expenditure on litter clean-up for stray plastic bags, using the same assumptions as used in earlier analysis

[122] Assumptions used for modelling purposes by Allen Consulting Group in report *The ANRA proposal on plastic bag Management: Supplementary economic analysis to the EPHC Report,* pp. 12-13

Findings

Costs and benefits (compared to baseline)

High take-up (scenario 1a)

Benefits (PV, $m)	Costs (PV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$170	-$562	-$392	$392	111 million

Modest Take-up (Scenario 1b)

Benefits (PV, $m)	Costs (PV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$154	-$430	-$276	$276	102 million

The supplementary ACG analysis estimated that the benefits of the proposed ANRA code would be $154 million to $170 million in present value terms over the period from 2006 to 2016, depending on the number of participating retailers. Costs identified would range from $430 million to $562 million over the same period.

A number of factors (such as social benefits) have not been quantified for this option. According to the supplementary analysis, these would need to be a benefit greater than $392 million over the period before the 'high take-up' option provides an improvement in social welfare, and $276 million before the 'modest take-up' option does so.

Other key findings

Environmental impacts

- Impact on litter: 102 to 111 million fewer (non-biodegradable) plastic bags would be littered over the period than under the baseline option, depending on the rate of take-up of the code by retailers.

Implications

If under this option the ANRA proposal formed part of the National Packaging Covenant, retailers with an annual turnover of under $5 million would continue to be exempt from action. Without connection to the covenant, the take-up of the code is likely to be far lower. Additional education and other campaigns may be required to ensure the non-supermarket sector is not left behind.

As a key component of the ANRA proposal is the use of biodegradable bags, careful consideration of the implications of a switch will be required, including non-litter impacts (such as impacts on landfill or greenhouse gas emissions). The environmental impacts of a variety of degradable bags would need to be acceptable under a range of environmental conditions and degradation would need to occur within a reasonable timeframe for the use of such bags to be acceptable to governments.

Care will also be required to ensure that other bag-avoidance activities continue. A situation where bag use returns to pre-2003 levels, with HDPE simply replaced by a biodegradable alternative, is unlikely to be acceptable to many stakeholders. ACG point out that there is a risk under this

option of retailers abiding by the letter (and not the spirit) of the agreement, by continuing to use the cheaper HDPE bags up to the '50 percent of 2002 quota', and using biodegradable bags beyond that. This would significantly reduce the costs and benefits of the option.

Option O: The ANRA proposal, with added targets for reduction (ACG supplementary scenarios 2a and 2b)

Description and assumptions

The ANRA proposal does not currently have any targets for further carry bag reductions beyond 2006. As a further hypothetical option, ACG was asked to provide analysis of the likely environmental and economic impacts of the inclusion of a 10 percent additional reduction per year. The inclusion of targets in future years has not been endorsed by ANRA or its members to date.

As with Option N, ACG was asked to consider two variations of this option to consider different rates of take-up by retailers.

Two variations on the ANRA proposal were considered. The significant difference was the assumed take-up by the retail sector.

Oa) The 'high take-up' scenario assumes acceptance and achievement of targets by all Group One retailers, plus all other retailers with an annual turnover greater than $5 million per year. Such a threshold would apply if the proposed ANRA code of practice were appended to the National Packaging Covenant.

Ob) For the purpose of this analysis, a 'modest take-up' scenario is projected, including all Group One retailers plus 25 percent of Group Two retailers.

Without a form of free-rider coverage such as that offered by the National Packaging Covenant, take-up of the code is likely to be much lower, with moral persuasion and customer demand being the major drivers of sign up to the code by non-ANRA members.

Option O: assumptions
For the purposes of this cost-benefit analysis, this option is assumed to consist of the following features:[123]

Timing

- programme begins from 2006 (assume maintenance of infrastructure established under the ARA code), and runs for 5 years, with bag numbers maintained at that level thereafter

Industry

- eligible retailers in each option reach their 50 percent target by the end of 2006
- eligible retailers achieve an annual reduction in plastic bag consumption of 10 percent based on end-2005 levels (i.e. the quantitative bag target each year is set at 90 percent of the previous year's outcome)

[123] Assumptions used for modelling purposes by Allen Consulting Group in report *The ANRA proposal on plastic bag Management: Supplementary economic analysis to the EPHC Report*, pp. 16-17

- otherwise, similar commitments to those in the ARA code (i.e. education, support for litter eradication, continued promotion and provision of alternatives, etc.)

Households

- consumers respond to suasive efforts of retailers, and therefore face increased costs due to their switch to more expensive substitutes
    - initial costs are therefore associated with savings from plastic bags that are no longer consumed, and costs associated with a switch to single-use bag alternatives

Government

- ongoing costs in monitoring and administration
    - 'modest take-up' scenario, estimated as the same as baseline – conservatively estimated at 0.1 full-time equivalent employee for administration and monitoring compliance for each jurisdiction (nine jurisdictions at $11,000 each, totaling $99,000)
    - 'high take-up' scenario, assumed to be slightly greater if appended to the covenant (costs to be scaled accordingly)
- reduction in expenditure on litter clean-up for stray plastic bags, using the same assumptions as used in earlier analysis

Findings

Costs and benefits (compared to baseline)

High take-up (scenario 2a)

Benefits (PV, $m)	Costs (PV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$93	-$799	-$706	$706	148 million

Modest take-up (scenario 2b)

Benefits (PV, $m)	Costs (PV, $m)	Net impact (NPV, $m)	Required unquantified benefits (NPV, $m)	Reduction in plastic bag litter
$84	-$535	-$450	$450	134 million

The supplementary ACG analysis estimated that the benefits of the proposed ANRA code would range from $84 million to $93 million in present value terms over the period from 2006 to 2016, depending on the number of participating retailers. Costs identified would range from $535 million to $799 million over the same period.

A number of factors (such as social benefits) have not been quantified for this option. According to the supplementary analysis, these would need to be a benefit greater than $706 million over the period before the 'high take-up option' provides an improvement in social welfare, and $450 million before the 'modest take-up option' does so.

Other key findings

Environmental impacts

- impact on litter: 134 to 148 million fewer (non biodegradable) plastic bags would be littered over the period than under the baseline option, depending on the rate of take-up of the code by retailers.

Implications

Without some form of protection from free-riders (such as appending the revised ANRA code to the National Packaging Covenant), it is difficult to imagine that many retailers would voluntarily accept the burden of ongoing, ever-increasing targets.

If the revised ANRA proposal were to form part of the National Packaging Covenant, retailers with an annual turnover of under $5 million would continue to be exempt from action. Some kind of response may be required to address this sector.

The analysis by ACG relies on the assumption that further bag reductions by retailers will be achieved only by suasive measures to encourage consumers to change their bag habits. ACG points out that there may be more time- and cost-efficient means of achieving this by voluntary methods (for example, by introducing a transparent charge or by switching to the use of alternatives only). However, this would depend on the reasons behind the current retailer practice of not charging for bags.

Questions for consultation (relating to options A- O):

- **Are there other factors that need to be considered and are not addressed in the cost/benefit analysis?**
- **If so, what are they?**
- **Feedback from businesses, including small to medium-sized businesses, is sought in relation to the estimated administrative costs for these options, including the extent to which your organisation could reduce its use or supply of plastic bags, including expected associated costs and potential barriers. These costs could include the average time spent by individual businesses implementing the administrative and recordkeeping requirements for each of the options, and the cost of that time to business.**

8. Consultation

The principal form of consultation with various stakeholder groups will be via the release of this consultation RIS however extensive consultation has already be undertaken.

8.1. Who are the main affected parties?

Almost every person in Australia who goes shopping on a regular basis will be affected, to a greater or lesser extent, by a restriction in the availability of plastic carry bags. As this consultation RIS indicates, this impact will be greater on some sectors of the economy than on others.

Chapter 3 of the ACG cost-benefit analysis report discusses impacts on the following stakeholders:

- manufacturers
- retailers
- government
- consumers.

In addition to the extensive consultation undertaken between governments and other stakeholders in 2002 through the Plastic Bag Working Group (see section 2), the following consultation has occurred.

8.1.1 Plastic bag manufacturers

The main stakeholders affected by options that involve a reduction or elimination of plastic bags are the manufacturers and importers of plastic bags. There are two firms which provide the bulk of Australia's domestic production, with one accounting for approximately 70 percent of Australia's domestic production.[124]

Local manufacture of plastic bags makes up around 25 percent of the total plastic bag usage in Australia and contributes less than 0.002 percent to Australia's GDP. The remainder of plastic bags are imported.

Discussions have taken place between government officials and the major Australian manufacturer of plastic bags on the impacts of further reductions in demand for single-use plastic bags, brought about either by further regulation or voluntary action (although the specific options in this draft RIS have not been discussed). In addition, the Plastics and Chemicals Industries Association has been an observer in the working group discussions that led to the development of the draft voluntary plastic bags phase-out agreement considered by EPHC in 2005. The plastics industry has indicated that it will seek compensation in the event of the introduction of new regulations which lead to further losses by the plastic bag manufacturing sector, along the lines of assistance packages designed for forestry and fishing industries. A study commissioned specifically by DEH to estimate the impacts of phase-out options on domestic industry concluded:

> Phasing out HDPE plastic bag usage would significantly reduce the labour force for businesses in the HDPE plastic bag manufacturing sector. This reduction is estimated at 43 jobs… There may be further job losses from materials suppliers… however, these would be

[124] Hyder Consulting and the Centre for International Economics, 'Costs and Benefits for the Australian Plastics Industry of Phasing Out Single Use Plastic Carry Bags', May 2006, p. 2. Advice prepared for the Department of the Environment and Heritage.

relatively minor. Capital write-offs in HDPE plastic bag manufacturing would be in the order of $12 million as plastic bag manufacturing machinery is relatively purpose specific and overseas re-sale value would be low.[125]

However, the study also notes that the impacts would be disproportionately felt by the major firm involved in plastic bag manufacture.

8.1.2 Retailers

The retail sector in Australia is very diverse in terms of enterprise size (ranging from major national supermarket groups to very small 'corner shop' style enterprises) and in terms of products sold. The Australian Bureau of Statistics identifies around 200,000 enterprises in the retail sector,[126] although not all of these use plastic bags. Nevertheless, this gives an indication of the size and diversity of the sector and the challenge in ensuring wide consultation on any further proposals to manage plastic bags. As discussed in section 3, governments have been consulting retailers and retailer representative groups through various initiatives to address plastic bag litter. These include:

- negotiations through a multi stakeholder Plastic Bags Working Group established in October 2002;
- development and implementation of the 2003 ARA Code;
- negotiations to develop the now stalled draft 2005 phase out agreement and subsequent discussions over an alternative proposal (that led to the May 2006 ANRA proposal);
- discussions through the plastic bag Roundtable meetings hosted in 2004 and 2005 by the Australian Government Minister for the Environment and Heritage, Senator the Hon Ian Campbell MP; and
- negotiations on alternatives to the light weight plastic bags through a taskforce established by ANRA during 2006.

8.1.3 Consumers

Release of this consultation RIS is the first step in seeking the views of consumers on these regulatory options on plastic bags, although the Australian Consumers Association was involved in the development of the 2002 report to EPHC *Plastic Shopping Bags in Australia*.[127] The primary source of information available on consumer views on plastic bags are opinion surveys carried out by various groups including government.

Governments are keen to obtain feedback from consumers and consumer groups about the value and impact of the various options canvassed in this RIS. Of particular interest will be the impact the various options are likely to have on:

- remote and regional communities
- low income groups

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[125] Hyder Consulting and Centre for International Economics, *Costs and Benefits for the Australian Plastics Industry of Phasing Out Single Use Carry Bag*', May 2006, p.3. Advice prepared for the Department of the Environment and Heritage.

[126] In 2004 ABS figures indicated there were around retail 200,000 businesses, excluding motor vehicle retailers. Note not all retailers may distribute plastic bags. http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/090DA0FCAF499A6CCA257092007506D3/$File/8161055001_jun%202004.pdf (Accessed 9/1/07). .

[127] http://www.ephc.gov.au/ephc/plastic_bags.html

- Indigenous communities
- families, particularly those with young children
- mobility-impaired persons, including the elderly and disabled persons
- the general population that have 'unplanned' or 'spontaneous' shopping trips where the consumer does not bring a reusable bag.

8.1.4 Government

The main avenue for consultation between the various levels of Australian government will be via the EPHC. Each jurisdiction is obliged under the Council of Australian Government (COAG) processes to bring back whole-of-government advice before any final decision is taken by the EPHC.

There has been no formal consultation on these options to date with local government. However, it should be noted that the Australian Local Government Association (ALGA) is represented on the EPHC and has been involved in discussions at EPHC on this issue.

8.1.5 Environment groups

Although there has been interaction between various levels of government and environmental organisations on plastic bags, dating from the involvement of Clean Up Australia and Planet Ark in the Working Group Report to the National Packaging Covenant Council in 2002, there has been no formal consultation to date between representatives of government and environment non-government organisations on the options and costings contained in this RIS.

Questions for consultation:

- **Have all affected parties been represented in discussions to date?**
- **What are the major groups that have not been involved?**
- **Are you able to provide additional information to assist in improving the level of consultation?**

9. Conclusion and Recommended options

9.1. Brief summary of each option

The options considered in this consultation RIS for managing plastic bag litter are:

Litter Focused Options

- Option A: Enforcement
- Option B: Behaviour change
- Option C: Litter clean up
- Option D: Litter infrastructure
- Option E: Advance disposal fee (*ACG scenario 7)*

No further government action

- Option F: baseline scenario *(ACG scenario 2)*

Plastic Bag Consumption Focused Options

- Option G: extension of ARA code of practice beyond 1 January 2006 (*ACG scenario 3)*
- Option H: industry agreement to impose a gradually escalated charge, supported by government co-regulation measures such as a NEPM (*ACG scenario 4)*
- Option I: industry agreement to phase out plastic bags in the short term, followed by government regulation to phase out remaining bags from 2009 (*ACG scenario 5)*
- Option J: retailers obliged by regulation to impose a minimum charge for plastic bags; retailers retain revenue from charge (*ACG scenario 8)*
- Option K: government imposes levy on plastic bags (*ACG scenario 9)*
- Option L: elimination (ban) of plastic bags by government regulation on 1 January 2009 (*ACG scenario 1)*
- Option M: elimination of plastic bags by government regulation prior to 1 January 2009 (*ACG scenario 6)*
- Option N: a voluntary commitment by retailers to carry on education and other activities from the 2003–05 ARA code of practice, with a target of reducing plastic bag use by 50 percent by the end of 2006, with further reductions depending on the availability of environmentally sustainable alternative carry bags (the ANRA proposal) (*ACG supplementary scenarios 1a and 1b)*
- Option O: as for Option N but with additional targets of a 10 percent year-on-year reduction in plastic bag use after 2006 (*ACG supplementary scenarios 2a and 2b*).

9.2. Preferred options

ACG found that 'in comparison to the option under which no further action is taken, all change options identified by the Environment Protection and Heritage Council produce outcomes in which the estimated economic and environmental costs exceed the benefits by substantial margins'.[128] The ACG reports also estimated the unquantified value that would need to be applied for these options to 'break-even'. This can equate to the social benefits attributed to an action (discussed in more detail in the introduction to Section 7).

[128] Allen Consulting Group, *Phasing Out Light-Weight Plastic Bags*, 2006, p. vii

If the value of the social benefit of phasing out plastic bags is determined to be sufficient to justify regulatory action, a mandatory charge or a ban on plastic bags implemented at state level in a nationally consistent manner appear to be the regulatory options that are most appropriate. EPHC noted at its November 2006 meeting that a mandatory charge or a ban would be considered further. These two options provide mechanisms that can be implemented with minimal administration or constitutional complications (for example as compared to the advanced disposal fee, in which the fee would need to be set and monitored for each region to reflect litter collection costs). These options are anticipated to result in substantial reductions in plastic bag distribution, and hence a follow through to plastic bag litter.

10. Implementation

10.1. Implementing a mandatory charge

A mandatory charge would be best implemented in a nationally consistent way through state and territory based legislation. A mandatory charge would not be a tax because the funds raised are not used for a public purpose and are kept by the retailers. Therefore the Australian Government taxation powers could not be used as a head of power to enforce such a charge. The states and territories have the power to introduce legislation that would require retailers to apply a charge on plastic bags provided. The Australian Government legislation would only apply to retailers that are incorporated and therefore a significant number of retailers who are not incorporated would not be covered.

A mandatory charge would be applied at the point of sale to be paid by the customer. The charge would be applied in a transparent manner on a per bag basis and itemised on the receipt and would be subject to GST.

To implement a mandatory charge in a nationally consistent way, jurisdictions would need to agree on consistent regulatory requirements, including:

- the minimum level of the charge to be applied
- any review and/or increase to the minimum charge
- consistently defined exemptions.

Jurisdictions would have to implement these requirements through relevant state-based regulatory tools. This may require changes to primary legislation (i.e. creation of a 'head-of-power") and/or creation of subordinate legislation and therefore affect the time taken to develop and implement.

Should a decision be taken to pursue legislation, the start date for the legislation would be 1 January 2009 however for natural justice reasons, a phase-in period would also be required before any enforcement could be undertaken (minimum three months).

Inconsistent application of the charge could be problematic. A charge set in subordinate legislation would be a minimum charge however some retailers may charge more. Consumers may, for the most part, have a choice in whether or not they accept to pay for the plastic bags and also a choice in where they shop if plastic bag charges vary between retailers. This would help to keep the charge low. However, the range of choice of retailers may be considerably less for consumers that live in remote or rural areas. This option may therefore benefit from monitoring to ensure retailers apply a fair and reasonable charge if they chose to exceed the minimum charge. Generally though where retailers are in competition for customers, this issue is expected to be managed by the market. Consumers may become conditioned to buying bags and the size of the fee may need to be revised over time. This has occurred in Ireland where the Plastax is to be increased from 15 to 22 eurocents (from $0.25 to $0.37 AUD).[129]

Uniform application of this option by state and territories is essential otherwise the *Mutual Recognition Act 1992* would come into force, unless all states and territories implemented the option in a uniform way.

[129] Tracy Hogan, "More for plastic bags" 29 August 2006, *The Irish Independent*.

Questions for consultation

- **Should a decision be taken to implement a mandatory charge?**
- **When and how often should such legislation to be reviewed, particularly the level of charge?**
- **Do the social benefits and community support for eliminating plastic bag litter justify implementing a mandatory charge?**
- **At what level should a mandatory charge be set, eg 10 cents, 25 cents?**

10.2. Implementing a Ban

A ban on the sale or supply of plastic bags would be best implemented in a nationally consistent manner through state and territory based legislation. As discussed above relevant Australian Government powers extend only to retailers that are incorporated, which would leave a significant number of retailers not covered by ban legislation.

Implementing a ban on plastic bags would not be practical unless exemptions are made to allow for the sale of plastic bags that have an environmental function such as reusable 'green bags'. The proposed definition in Section 2.1 accounts for these exemptions.

To implement a ban jurisdictions need to identify appropriate existing legislation or amend primary legislation (i.e. creation of a 'head-of-power") and/or creation of subordinate legislation to enforce a ban. Jurisdictions would also need to agree on consistent regulatory requirements for the ban including potential offences and associated enforcement of penalties.

The start date for the legislation would be 1 January 2009 however for natural justice reasons, a phase-in period would be required before any enforcement could be undertaken (minimum three months). Strong monitoring and enforcement activities may be required. Consequently the importance of local government involvement would be high and extensive consultation would be required for successful implementation.

Questions for consultation

- **Should a decision be taken to implement a mandatory ban?**
- **When and how often should such legislation be reviewed?**
- **Do the social benefits and community support for eliminating plastic bag litter justify implementing a ban?**

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