

The Allen Consulting Group

The ANRA proposal on plastic bag management

Supplementary economic analysis to the EPHC report

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Report to Commonwealth Department of the Environment and Heritage

The Allen Consulting Group

The Allen Consulting Group Pty Ltd

ACN 007 061 930

Melbourne

4th Floor, 128 Exhibition St
Melbourne VIC 3000
Telephone: (61-3) 9654 3800
Facsimile: (61-3) 9654 6363

Sydney

Level 12, 210 George St
Sydney NSW 2000
Telephone: (61-2) 9247 2466
Facsimile: (61-2) 9247 2455

Canberra

Level 12, 15 London Circuit
Canberra ACT 2600
GPO Box 418, Canberra ACT 2601
Telephone: (61-2) 6230 0185
Facsimile: (61-2) 6230 0149

Perth

Level 21, 44 St George's Tce
Perth WA 6000
Telephone: (61-8) 9221 9911
Facsimile: (61-8) 9221 9922

Brisbane

Level 11, 77 Eagle St
Brisbane QLD 4000
PO Box 7034, Riverside Centre, Brisbane QLD 4001
Telephone: (61-7) 3221 7266
Facsimile: (61-7) 3221 7255

Online

Email: info@allenconsult.com.au
Website: www.allenconsult.com.au

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Summary

Table 1.1

PRESENT VALUE OF COSTS AND BENEFITS, COMPARED TO CURRENT LEVEL OF EFFORT

	PV Costs (\$m)	PV Benefits (\$m)	NPV (\$m)	Littered bags (millions)
High take-up (1a)	-\$322	\$150	-\$173	-81
Modest take-up (1b)	-\$191	\$136	-\$55	-75
High take-up (2a)	-\$560	\$85	-\$475	-135
Modest take-up (2b)	-\$295	\$77	-\$219	-122

Note: Present values are calculated using a 7 per cent discount rate for costs and benefits between the years 2006 and 2016 inclusive.

Figure 1.2

ESTIMATED GDP IMPACTS COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016

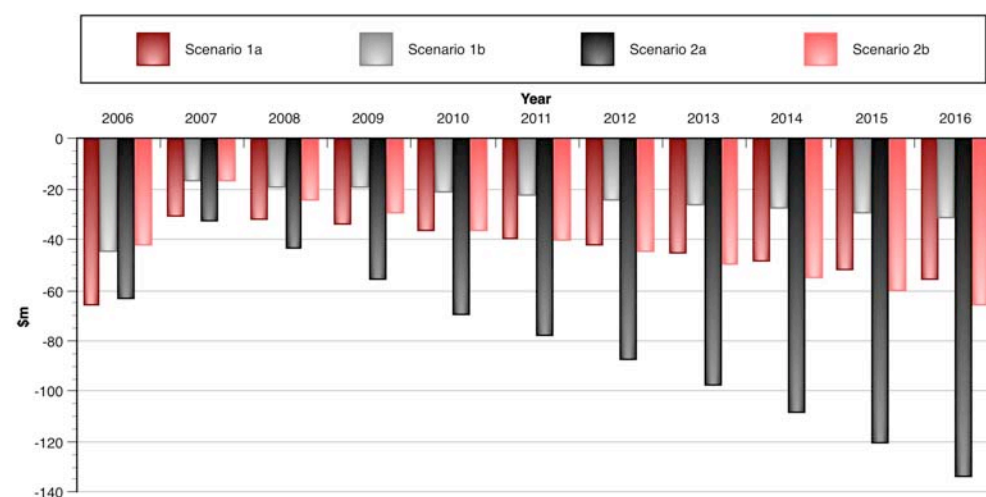


Figure 1.3

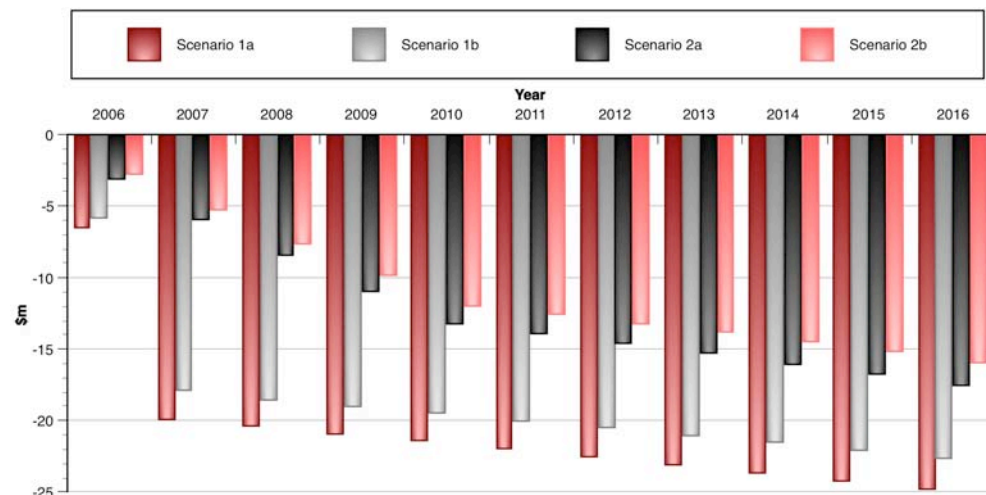
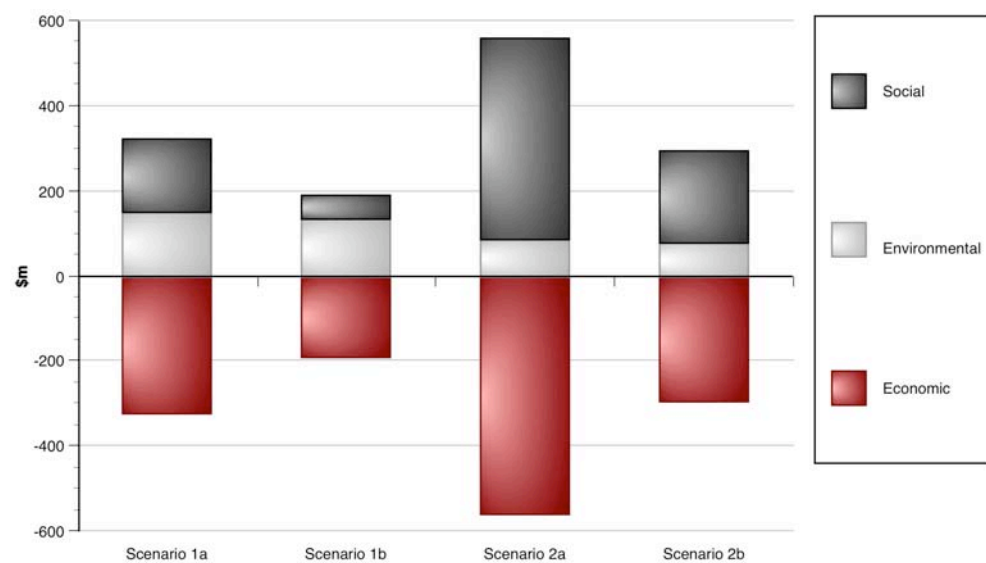
ESTIMATED ENVIRONMENTAL DAMAGE IMPACTS COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016


Figure 1.4

COSTS, BENEFITS AND IMPLIED SOCIAL BENEFIT 'GAP'


Chapter 1

Background

This report supplements analysis commissioned by the Environment Protection and Heritage Council (EPHC) on options for phasing out use of light weight plastic bags (LWPBs) — as commonly used to carry goods in the supermarket and retail sector. The original report — called *Phasing Out Lightweight Plastic Bags – Cost and Benefits of Alternative Approaches* — was written by the Allen Consulting Group, and delivered in May 2006. It has informed development of a Regulatory Impact Statement on policy options for managing plastic bags, and is currently held by Australian and state government officials.

In recent years, action to reduce plastic bag consumption has been driven by the Australian Retailers' Association *Code of Practice for the Management of Plastic Bags* (the ARA Code — which was appended to the National Packaging Covenant). Action under the Code was an outcome of past negotiations between Australian governments and retailers on targets and mechanisms for reducing plastic bag consumption.

Commitments under the ARA Code expired at the end of December 2005. Policymakers are currently considering new measures and initiatives for keeping pressure on LWPB use. Two options — one put forward by the Australian National Retailers' Association (ANRA), and another comprising a progressive or 'ratcheting' target approach — are analysed in this report.

1.1 Links to the EPHC report

The EPHC report represented a cost-benefit analysis of nine different policy options for dealing with lightweight plastic bags. These are outlined in Box 1.1.

Box 1.1

EPHC REPORT POLICY SCENARIOS

- | |
|--|
| <p>Scenario 1 — elimination of LWPBs from 2009;</p> <p>Scenario 2 — no further government action (used as the study's 'base case');</p> <p>Scenario 3 — extension of the ARA Code;</p> <p>Scenario 4 — industry agreement to impose a gradually escalated charge, supported by co-regulatory measures;</p> <p>Scenario 5 — industry agreement to phase out LWPBs, followed by government regulation to restrict their supply;</p> <p>Scenario 6 — a stand-alone ban on LWPBs;</p> <p>Scenario 7 — an advance disposal fee for LWPBs;</p> <p>Scenario 8 — retailers will be obliged (by regulation) to impose a minimum charge on every LWPB; and</p> <p>Scenario 9 — a government imposed levy on LWPBs.</p> |
|--|

Source: Allen Consulting Group 2006, *Phasing Out Lightweight Plastic Bags – Cost and Benefits of Alternative Approaches*, Sydney.

Key framework assumptions and approaches of relevance to this study were:

- The EPHC study addressed social, economic and environmental dimensions of bag reduction policies;
 - net economic costs were associated with compliance and substitution costs for industry, households and government
 - net environmental benefits were linked to litter reduction stemming from reduced plastic bag use, with a ‘test’ value for environmental benefits put at \$1.00 for each plastic bag eliminated from the litter stream.
 - net social benefits were not directly estimated, but identified as needing to be at least as large as the ‘gap’ between economic costs and environmental benefits in order to justify the policy. These social benefits would need to attach primarily to addressing community concerns about excessive plastic bag consumption and related waste issues.
- Policy scenarios were analysed (and net present values calculated) over the period from 2006 to 2016. While the implementation year of each policy varied, all policies were assumed to be fully in effect by 1 January 2009.
- Projected demand for bags was assumed to be linked to retail sales. In the absence of specific policy constraints or exogenous factors this was estimated to grow at 2.5 per cent per annum.
- The EPHC utilised a general equilibrium modelling framework (the MMRF-Green model) to capture economy-wide and inter-industry effects.

This analysis

The analysis presented here draws on and extends the EPHC study results. While it does not use the MMRF-Green model to compute economic impacts, outputs from the EPHC exercise allow estimates for supplementary scenarios to be developed based on a combination of scaling and interpolation.

A key ‘baseline’ assumption in this analysis is that the investment that has already been made by government and retailers in terms of staff training, advertising and other infrastructure provides a base for future policy to build on. Rather than considering the wind-down of these training and monitoring costs as a ‘saving’ (e.g., under a presumption of ‘no further action’), these are assumed to be a ‘given’. This means that the costs and benefits estimated here are those that are *additional* to established levels of effort.

The relevant cost comparison baseline for *this* analysis is similar to Scenario 3 in the EPHC analysis — the extension of the ARA Code. The assumptions around, and the estimates for, Scenario 3 come closest to the baseline assumption required for this supplementary analysis, which assumes continuation of the current pattern of Group 1 effort over time. A summary of the impacts of the different policy scenarios compared to the baseline that was used in the EPHC analysis — so that all of the scenarios can be meaningfully compared with one another — is shown in Appendix A. A broad description of the continuing level of ‘investment’ by stakeholders in bag reduction assumed in the baseline used for analysing changes in bag reduction effort in this report is provided in Box 1.2.

Box 1.2

'BASELINE' ASSUMPTIONS FOR THE SUPPLEMENTARY ANALYSIS

- Governments maintain the current level of effort in terms of education, litter action and monitoring.
- Retailers maintain the current level of voluntary effort — there are no new participants.
- Consumer bag consumption patterns remain consistent with 2005 behaviour in terms of their demand for plastic bags, re-usables and other alternatives.
- Bag consumption grows at 2.5 per cent a year, in line with assumed growth in retail turnover.

The estimates derived bear comparison with those presented in the EPHC report and are within the bounds of uncertainty that is inherent in a modelling exercise. A primary aim of this report is to facilitate that comparability by applying methodologies, population growth and composition estimates and behavioural assumptions that are consistent with those used and reported in the EPHC study.

The EPHC work remains the principal reference for a discussion of those estimates, assumptions, methodologies and derivations. In interpreting this analysis, the reader can assume that results reported for the supplementary policy scenarios are readily comparable to those in the EPHC report. Aggregated and 'high level' numbers (e.g., Gross Domestic Product (GDP) impacts, environmental benefits, NPVs, etc) are most robust in this regard. The initial, sectoral impacts (that is, to retailers, households, and government) are provided for illustration, and are based on the high level aggregates.

1.2 Assumptions

Much of this analysis depends on the participation on non-Group 1 retailers with turnover of greater than \$5 million a year. Eligible retailers are assumed to account for 5 per cent of all retailers by number, and around 70 per cent of all plastic bags provided in 2005. However, no official statistics present retailer numbers in this manner, and as a result, the number of retailers that are assumed to participate in the scenarios is difficult to estimate precisely.

It has been assumed that the number of retailers with turnover greater than \$5 million is the same as the number of medium and large retailers used in Nolan-ITU's 2003 cost-benefit analysis.¹ Comparison with other sources of information suggests that this approach is roughly right. This approach also has the benefit of being consistent with the numbers that were used in the preliminary analysis.

1.3 Structure

Two sections of analysis follow.

Section 2 discusses the ANRA target outline

Section 3 discusses the proposed progressive target

¹ Nolan-ITU 2003, *Plastic Bag Mandatory Options — Cost Benefit Analysis*, Melbourne.

In Appendix 1 we provide a brief outline of costs and benefits likely to be associated with a price based approach to bags — in which retailers are required to apply an explicit price on bags set at \$0.03 (approximating cost recovery) and \$0.05 per bag.

Chapter 2

Analysis: the ANRA option

The Australian National Retailers Association has recently proposed a new approach to reducing LWPB consumption in Australia. The key dimensions of this are acceptance of a voluntary bag target, expansion of effort beyond Group 1 retailers and promotion of a biodegradable bag alternative.

2.1 Key dimensions of ANRA proposal

The analysis below focuses on the likely implications of the ANRA proposal on LWPBs. The defining characteristics of the ANRA proposal — as estimated — are outlined in Box 2.1.

Box 2.1

KEY CHARACTERISTICS OF THE ANRA SCENARIOS ANALYSED

Commitments and targets

Commitment to reach 50 per cent of 2002 bag consumption by end of 2006 (compared to actual result of 41.4 per cent by end of 2005).²

Thereafter, further reductions to be based on take up of 'environmentally sustainable alternative' — i.e., biodegradable bags.

Otherwise, similar commitments to those in the expired ARA code — education, support for litter eradication, continued promotion and provision of alternatives, etc.

Timing

Program begins from 2006 (assume maintenance of infrastructure established under established ARA Code efforts);

Impacts estimated over the period 2006-16

Role of Government

Same as under the baseline, however, activity levels would be slightly greater if appended to Covenant (costs to be scaled accordingly).

Take up rates are, of course, a critical issue in determining the likely impact of the program. Two 'coverage' scenarios are examined in the context of the ANRA action plan.

Scenario 1a (high take up): Acceptance (and achievement) of targets by current Group 1 retailers plus other retailers with an annual turnover greater than \$5 million per year (incorporating the full range of ANRA members)

AND

Scenario 1b (modest take up): Group 1 retailers plus 25 per cent of non-Group 1 (with the spread to smaller retailers achieved by the end of 2009).

² Hyder 2006, *Plastic Retail Carry Bag Use: 2002-2005 Consumption*, Melbourne.

Implications of biodegradable bags

Promotion of biodegradable bags is an important new ingredient to the analysis of LWPB policy. They are assumed to be offered as part of an initiative that sees LWPB use fall to 50 per cent of 2002 levels by the end of 2006 among all eligible retailers, with further bag demand growth serviced through biodegradables (and presumably, continued promotion of reusable bags with customer take up on a discretionary basis). Their implications for this study rests principally on their:

- cost relative to lightweight plastic bags and other bag substitutes;
 - Note that, like lightweight plastic bags — and in the absence of an explicit bag price, their cost will be spread across the cost of other sale items.
- capacity to improve environmental outcomes; and
 - Note that biodegradable bags can still enter the litter stream, and represent a litter and biological hazard. Their key benefit is that they deteriorate more quickly than an LWPB and hence are likely to pose this problem for a shorter time.
- social acceptability (and value) as an LWPB alternative.
 - Concern over throw-away waste and excessive resource consumption appears to be a significant driver of community attitudes to lightweight plastic bags. It is not clear that a switch to biodegradables would — in its own right — do much to address concerns in this area.

For this study, the following estimates for biodegradable plastic bags have been applied:

Cost — a cost for biodegradables of \$0.10 per bag (assumed to be of equivalent carrying capacity to an LWPB) has been applied (relative to an estimated LWPB cost of \$0.03 per bag);

Environmental impact: — Biodegradables are estimated to have an environmental lifespan that is approximately 30 per cent of that for a LWPB. It is therefore assumed that a littered biodegradable is likely to impose only 30 per cent of the cost of a LWPB — and achieving substitution of a biodegradable for a LWPB, **which is subsequently littered**, will therefore deliver 70 per cent of the environmental benefit.

Social impact: as with the EPHC study, we do not estimate a social benefit for the use (or reduced use) of biodegradable plastic bags. This value enters as a ‘balancing’ item — necessary to be at or above certain threshold in order to justify the policy in question on a triple bottom line cost-benefit basis.

2.2 Direct stakeholder implications

Retailers

It is assumed that eligible retailers in each scenario will reach their 50 per cent target by the end of 2006, and that all eligible retailers will switch from LWPBs to biodegradable bags from 2007 onwards. It is also assumed that, following the switch to biodegradables, eligible retailers continue their promotion of re-usable bags and their education and awareness initiatives. This is in order to address the fact that biodegradables could still be considered wasteful since they are used once and discarded.

The initial costs to retailers are therefore associated with:

- in-store education and promotion of re-usables;
- increased transaction times due to the transaction inefficiency of re-usable bags; and
- up-front costs of training and modification of store-fit-out for retailers that begin to participate from 2006 onward.

Once the 50 per cent target is reached at the end of 2006, the *number* of bags is assumed to grow at 2.5 per cent a year, in line with assumed growth in retail turnover. However, since growth in bags in the base case is assumed to occur at the same rate, the *proportion* of plastic bags and biodegradable bags in the scenarios is constant over time.

The expected **initial costs** to retailers from 2006 to 2016 under each scenario are:

- upfront costs of around \$55 million, and on-going costs of around \$15 million a year (with a present value of around \$160 million), **under Scenario 1a**; and
- upfront costs of around \$35 million, and on-going costs of around \$10 million a year (with a present value of around \$95 million), **under Scenario 1b**.

Consumers

It is assumed that consumers' consumption patterns remain as they were in 2005, in terms of demand for plastic bags, re-usables, bin-liners and so on. It is also assumed that retailers pass the full costs of biodegradable bags onto consumers (via increased mark ups on goods and services), so that consumers bear the increase in price despite the fact that they are still not directly charged for the bags.

The initial costs to consumers are therefore associated with:

- savings from the plastic bags that are no longer consumed;
- higher costs associated with retailers passing on the cost of biodegradables; and
- higher costs associated with the switch to single-use bag alternatives.

The expected **initial costs** to consumers from 2006 to 2016 under each scenario are:

- on-going costs of around \$85 to \$90 million a year (with a present value of around \$600 million), **under Scenario 1a**; and

- on-going costs of around \$75 to \$80 million a year (with a present value of around \$540 million), **under Scenario 1b.**

Government

There are two impacts on government (where government refers to the Australian Government, the governments of all of the states and territories, and all local government). The first is in relation to monitoring and administration. It is assumed that government monitoring and administration under Scenario 1b is the same as in the baseline, which assumed the continuation of current effort. Under Scenario 1a, increased government monitoring and administration is assumed to involve one additional, full-time equivalent employee in each of the nine jurisdictions.

The second impact is due to the reduction in littered plastic bags, and the subsequent reduction in effort associated with litter clean up. This is calculated using the same assumptions that were used in the preliminary analysis.

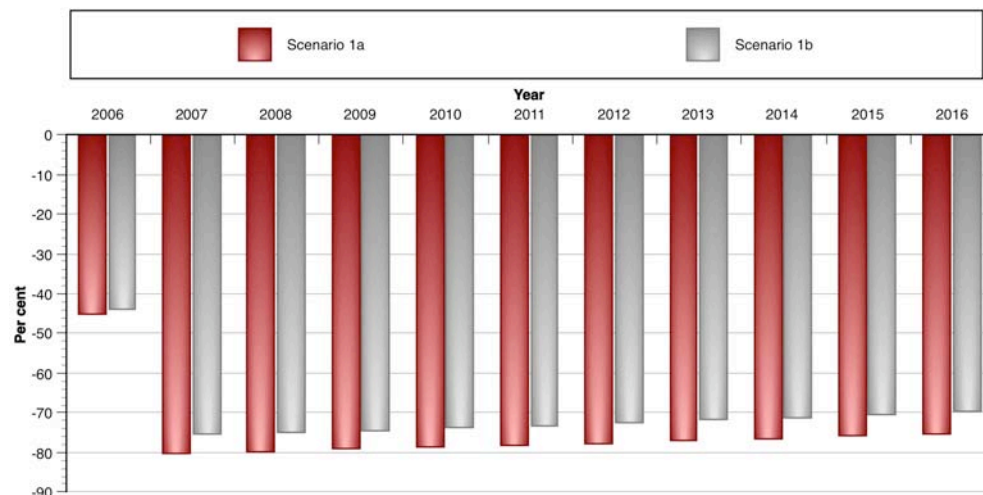
The expected **initial benefits** to government from 2006 to 2016 under each scenario are:

- on-going benefits of under around \$1 million a year (with a present value of around \$5 million), **under Scenario 1a;** and
- on-going benefits of under around \$1 million a year (with a present value of around \$6 million), **under Scenario 1b.**

Environment

Figure 2.1 shows the reduction in plastic bag consumption under the two scenarios relative to the base line. While the targets are set as 50 per cent of 2002 bag consumption, these targets do not apply to all retailers, so the reduction in total bags is less than the target, because smaller retailers are assumed not to participate in either scenario, and only a quarter of non-Group 1 retailers are assumed to participate in Scenario 1a. Additionally, once the target is reached — as assumed to occur at the end of 2006 — bag consumption grows in line with growth in retail turnover. With the switch to biodegradables in 2007, there is a significant reduction in plastic bags. The only LWPBs still provided by retailers are those that are provided by retailers that are not participating in the voluntary effort.

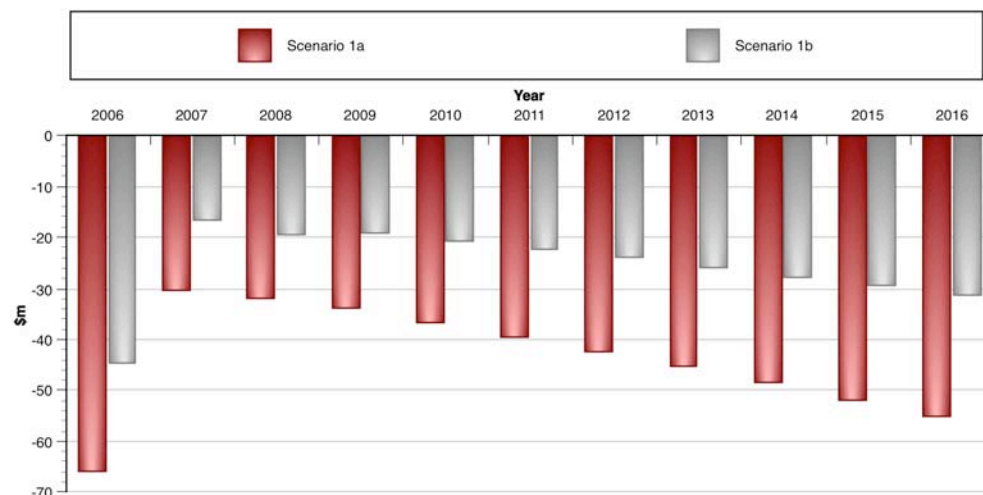
Figure 2.1

PERCENTAGE REDUCTION IN PLASTIC BAG CONSUMPTION, COMPARED TO 2002 LEVELS**2.3 Economy-wide and environmental impacts**

Costs to GDP range from \$35 to \$50 million a year under Scenario 1a to \$20 to \$30 million a year under Scenario 1b (see Figure 2.2). Costs to GDP are driven by:

- the adjustments costs to retailers;
- increased cost of substitutes faced by households, and subsequent reduction in expenditure on other goods and services as a result; and
- a switch from a product that is partly domestically produced (light-weight plastic bags) to substitutes that are fully imported (re-usables and biodegradables).

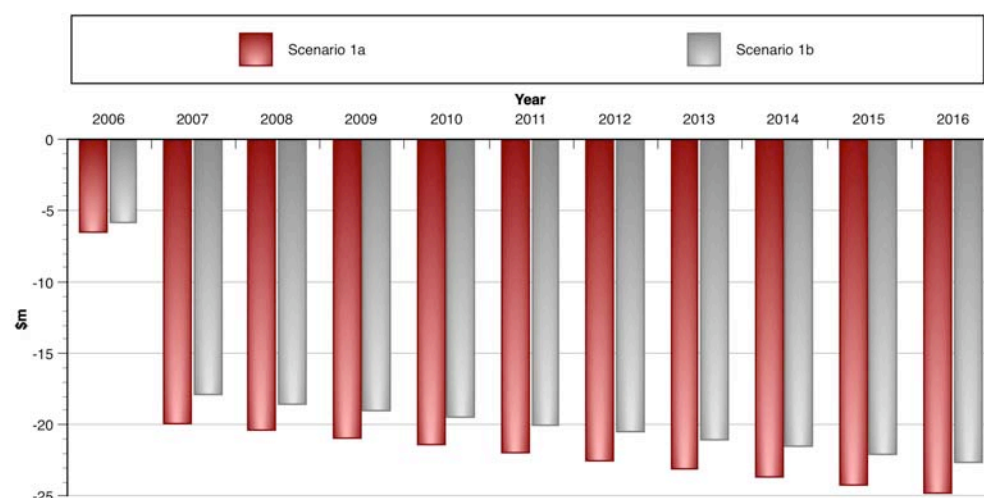
Figure 2.2

ESTIMATED GDP IMPACTS UNDER SCENARIOS 1A AND 1B COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016

As in the EPHC study, direct *environmental* benefits arise, not from the reduction in the number of bags consumed, but from reductions in the number of bags littered. The proportion of consumed bags that are littered are assumed to be the same as in the baseline — just under 1 per cent of all bags. In this analysis, another benefit is that the damage associated with biodegradable bags is only around 30 per cent of that of LWPBs. Between 2006 and 2016, the reduction in the environmental damage associated with *single use* bags (that is, light weight plastic bags, and their biodegradable substitutes) falls by around \$25 million a year in Scenario 1a, and around \$20 million a year in Scenario 1b (see Figure 2.3).

Figure 2.3

ESTIMATED ENVIRONMENTAL DAMAGE IMPACTS UNDER SCENARIOS 1A AND 1B COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016



The present values for net economic costs and environmental benefits for the two scenarios are shown in Table 2.1.

Table 2.1

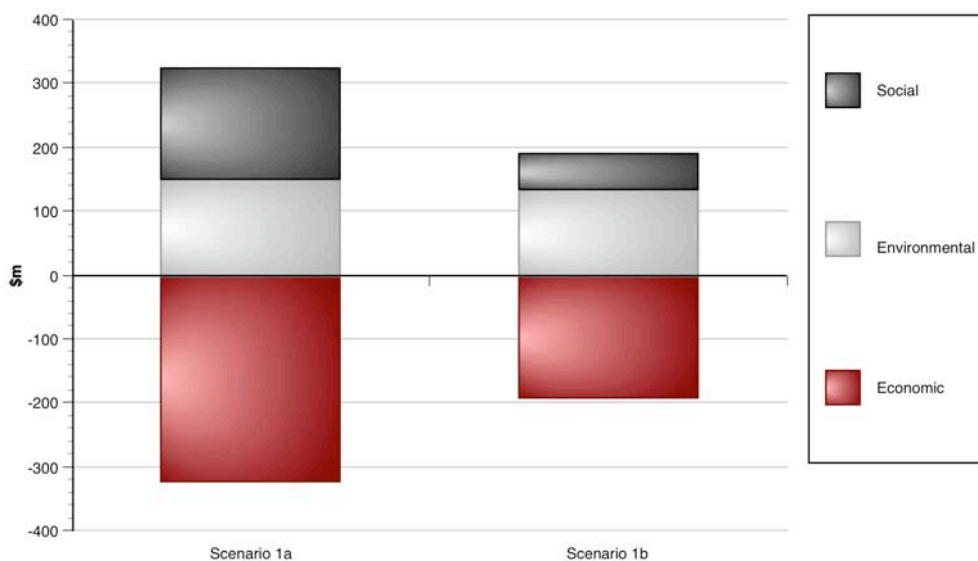
ANRA PROPOSAL: PRESENT VALUE OF COSTS AND BENEFITS

	PV Costs (\$m)	PV Benefits (\$m)	NPV (\$m)	Littered bags (millions)
High take-up (1a)	-\$322	\$150	-\$173	-81
Modest take-up (1b)	-\$191	\$136	-\$55	-75

Note: Present values are calculated using a 7 per cent discount rate for costs and benefits between the years 2006 and 2016 inclusive.

The net costs can also be thought of as the size that the social benefit would need to be to justify the policy on a cost-benefit basis (see Figure 2.4).

Figure 2.4

ANRA PROPOSAL: COSTS, BENEFITS AND IMPLIED SOCIAL BENEFIT 'GAP'**Further observations**

This analysis relies critically on the assumption that participating retailers will switch to biodegradables, and will continue their education and promotion of re-usable bags. In practice, it is possible that retailers may game the regulation — for example, by purchasing light-weight plastic bags equal to their quota for the year, before switching to biodegradable bags — and repeat this behaviour each year.

This would significantly reduce both the costs and the benefits of this option, as the costs associated with increased transaction times and in-store education and promotion would drop off, as would the benefits associated with a more environmentally benign bag and a switch to re-usables. These possibilities would need to be considered in relation to this option.

Chapter 3

Analysis: a progressive reduction target

An alternative to the ANRA proposal is to negotiate a progressive target with a focus on reducing LWPB use. The analysis below explores the implications of such a target, focusing on a progressive reduction in the number of lightweight plastic bags consumed in Australia.

3.1 Key dimensions of the progressive target option

The defining characteristics of the progressive LWPB target option examined in this report are outlined in Box 3.1. It represents commitment to an annual LWPB consumption target that tightens by 10 per cent per annum from 2005 levels, and maintains the *level attained* — as opposed to relative proportion — after 5 years.

Box 3.1

KEY CHARACTERISTICS OF THE ANRA SCENARIOS ANALYSED

Commitments and targets

Commitment to achieve an annual reduction in light weight plastic bag consumption of 10 per cent based on end-2005 levels (that is, the quantitative bag target each year is set at 90 per cent of the previous year's outcome);.

Otherwise, similar commitments to those in the ARA code — education, support for litter eradication, continued promotion and provision of alternatives, etc.

Timing

Program begins from 2006 (and builds on the infrastructure established under ARA Code efforts) and runs for 5 years, with bag numbers maintained at that level thereafter.

Impacts estimated over the period 2006-16.

Role of Government

Same as under the baseline, however, activity levels would be slightly greater if appended to Covenant (costs to be scaled accordingly).

Take up rates are, of course, a critical issue in the determining the likely impact of the program. Two 'coverage' scenarios are examined in the context of the progressive target.

Scenario 2a (high take up): Acceptance and achievement of targets by all retailers with annual turnover greater than \$5 million per year (with the spread to smaller retailers, ie. those beyond Group 1, achieved by the end of 2009).

AND

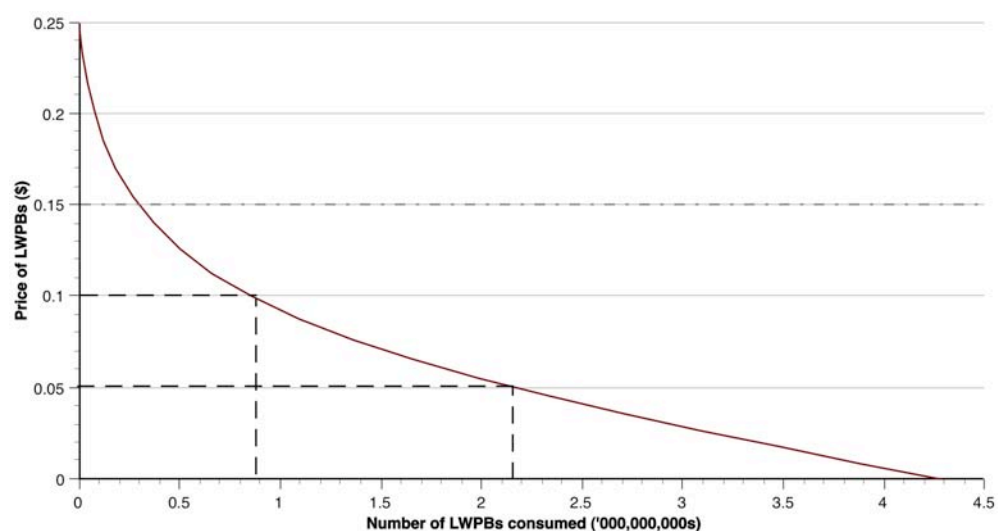
Scenario 2b (modest take up): Acceptance (and achievement) of targets by all Group 1 retailers plus 25 per cent of other retailers.

Implications of a moving target

There is a limit to effectiveness and cost-efficiency of voluntary initiatives. By increasing the size of the target each year, retailers will be required to expend more effort to meet the target. Consumer demand for plastic bags (see Figure 3.1) persists even at relatively high prices per bag. This suggests that there are people who continue to value plastic bags at these levels, which means that retailers will need to expend more effort in persuading these consumers to use plastic bag substitutes. Given the shape of the demand curve, it is also likely that each unit of reduction will require proportionally more effort than the preceding unit.

Figure 3.1

DEMAND FOR PLASTIC BAGS



Source: The Allen Consulting Group 2006, *Phasing out light-weight plastic bags*, Sydney p. 13.

For the purposes of this analysis, it has been assumed that an additional 10 per cent reduction can be achieved with an additional 15 per cent of effort. This pattern holds until 2010, when eligible retailers are required to maintain the *level* of plastic bags. In order to maintain the level reached in 2010, retailers will need to dedicate additional effort each year in order to counter growth in demand for plastic bags associated with growth in retail turnover, population growth and so on. It is assumed that growth in demand for plastic bags occurs at 2.5 per cent a year, and subsequently, it is assumed that retailers will need to increase their suasive efforts by 3 per cent a year in order to maintain a level of plastic bag consumption that is constant at 2010 levels.

3.2 Direct stakeholder implications

Retailers

It is assumed that eligible retailers in each scenario will meet their reduction targets for each year. Retailers are assumed to meet these targets through their promotion of re-usable bags and their education and awareness initiatives. The initial costs to retailers are therefore associated with:

- in-store education and promotion of re-usables;

- increased transaction times due to the transaction inefficiency of re-usable bags; and
- up-front costs of training and modification of store-fit-out for retailers that begin to participate from 2006 onward.

Given the discussion in the previous section on the implications of a moving target, retailer costs rise over time as they are required to exert proportionally more effort in order to dissuade customers from using plastic bags.

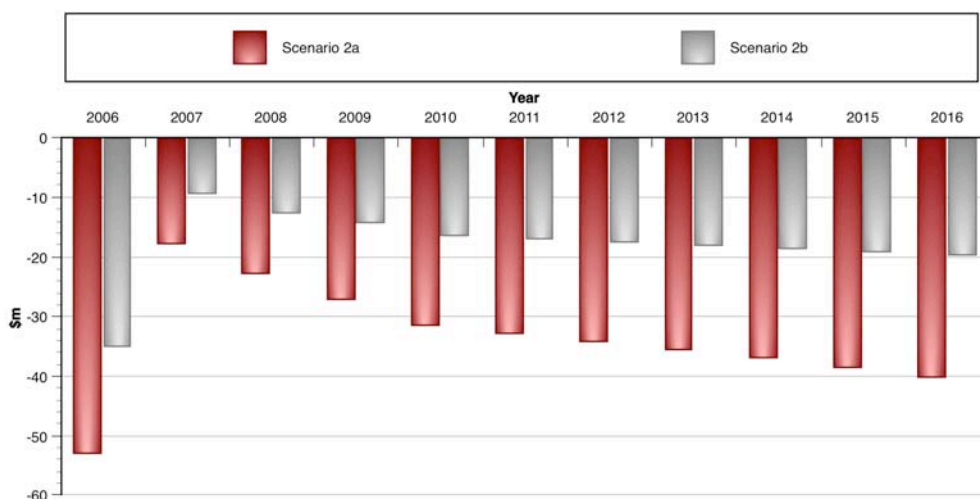
The expected **initial costs** to retailers from 2006 to 2016 under each scenario are:

- present value costs of around \$250 million **under Scenario 2a**; and
- present value costs of around \$135 million **under Scenario 2b**.

Figure 3.2 shows the magnitude and pattern of initial costs to retailers between 2006 and 2016.

Figure 3.2

INITIAL IMPACTS TO RETAILERS COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016



Consumers

It is assumed that consumers respond to the suasive efforts of retailers, therefore consumers face increased costs due to their switch to more expensive substitutes. The initial costs to consumers are therefore associated with:

- savings from the plastic bags that are no longer consumed; and
- costs associated with the switch to single-use bag alternatives.

The expected **initial benefits** to consumers from 2006 to 2016 under each scenario are:

- on-going benefits of around \$15 million a year (with a present value of around \$100 million), **under Scenario 2a**; and

- on-going costs of around \$10 million a year (with a present value of around \$95 million), **under Scenario 2b**.

Government

There are two impacts on government (where government refers to the Australian Government, the governments of all of the states and territories, and all local government). The first is in relation to monitoring and administration. It is assumed that government monitoring and administration under Scenario 2b is the same as in the baseline, which assumed the continuation of current effort. Under Scenario 2a, increased government monitoring and administration is assumed to involve one additional, full-time equivalent employee in each of the nine jurisdictions.

The second impact is due to the reduction in littered plastic bags, and the subsequent reduction in effort associated with litter clean up. This is calculated using the same assumptions that were used in the preliminary analysis.

The expected **initial benefits** to government from 2006 to 2016 under each scenario are:

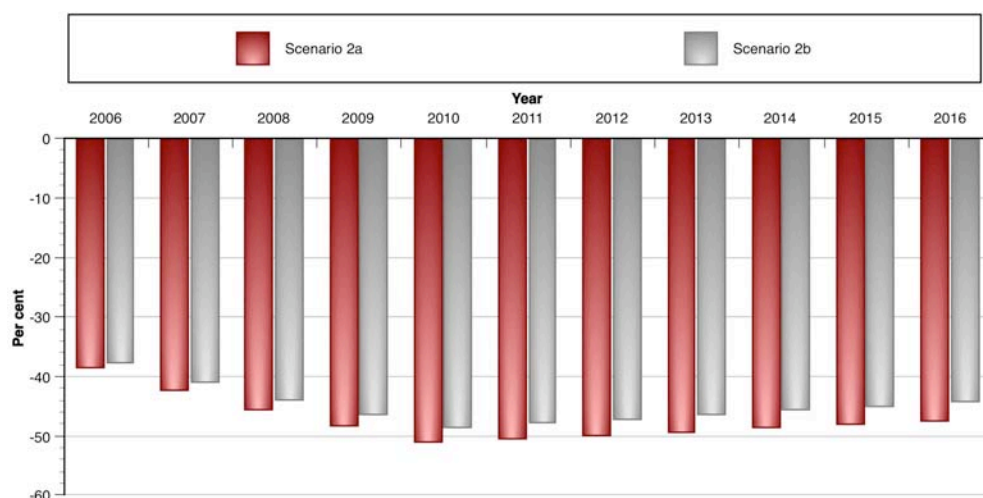
- on-going benefits of under around \$1 million a year (with a present value of around \$9 million), **under Scenario 2a**; and
- on-going benefits of under around \$1 million a year (with a present value of around \$8 million), **under Scenario 2b**.

Environment

Figure 3.3 shows the reduction in plastic bag consumption under the two scenarios relative to the base line. It should be noted that the targets only apply to *eligible* retailers. As a result, there is still growth in the plastic bags provided by smaller and non-participating retailers.

Figure 3.3

PERCENTAGE REDUCTION IN PLASTIC BAG CONSUMPTION, COMPARED TO 2002 LEVELS



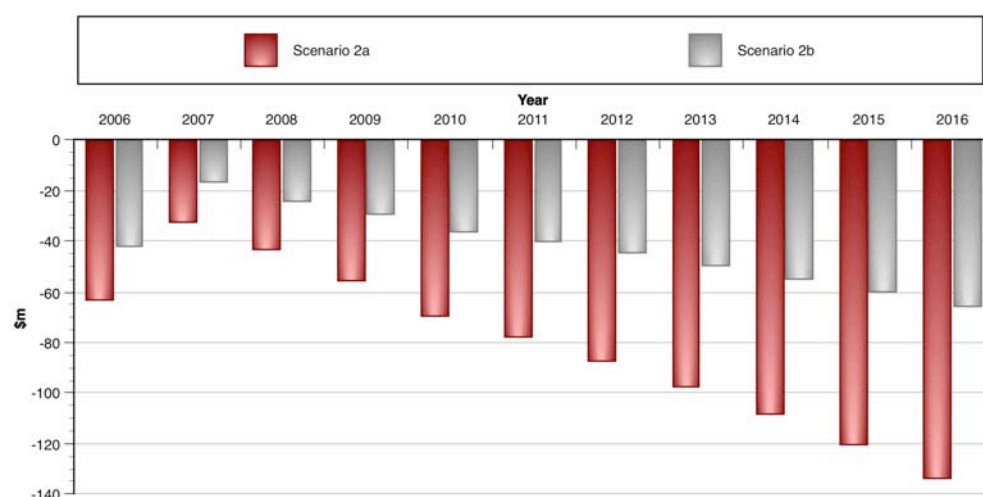
3.3 Economy-wide and environmental impacts

Costs to GDP vary significantly between 2006 and 2016 in both scenarios, due to the increasing costs of retailers chasing a moving target. Figure 3.4 shows the impact on GDP compared to the baseline. Costs to GDP are driven by:

- the adjustments costs to retailers, which increase over time, and which are passed on to consumers;
- increased cost of substitutes faced by households, and subsequent reduction in expenditure on other goods and services as a result;
- increased cost of retail items faced by households, due to retailers passing on their costs to consumers, and subsequent reduction in expenditure on other goods and services as a result; and
- a switch from a product that is partly domestically produced (light-weight plastic bags) to substitutes that are fully imported (re-usables).

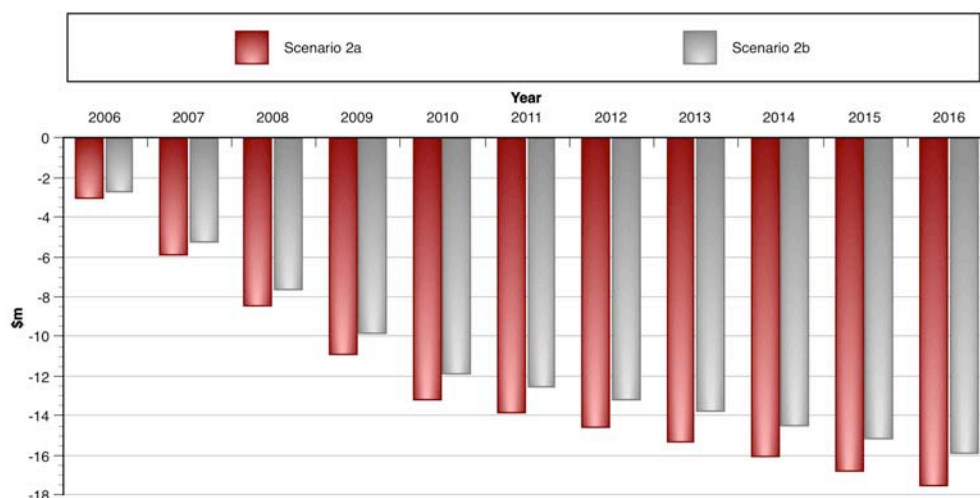
Figure 3.4

ESTIMATED GDP IMPACTS UNDER SCENARIOS 2A AND 2B COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016



As above, direct *environmental* benefits arise, not from the reduction in the number of bags consumed, but from reductions in the number of bags littered. The proportion of consumed bags that are littered are assumed to be the same as in the baseline — just under 1 per cent of all bags. Between 2006 and 2016, the reduction in the environmental damage associated with LWPBs grows over time, because the fixed level target met by retailers is being compared against a constantly growing number of littered bags in the baseline (see Figure 3.5).

Figure 3.5

**ESTIMATED ENVIRONMENTAL DAMAGE IMPACTS UNDER SCENARIOS 2A AND 2B
COMPARED TO THE CURRENT LEVEL OF EFFORT, 2006 TO 2016**


The present values for net economic costs and environmental benefits for the two scenarios are shown in Table 3.1.

Table 3.1

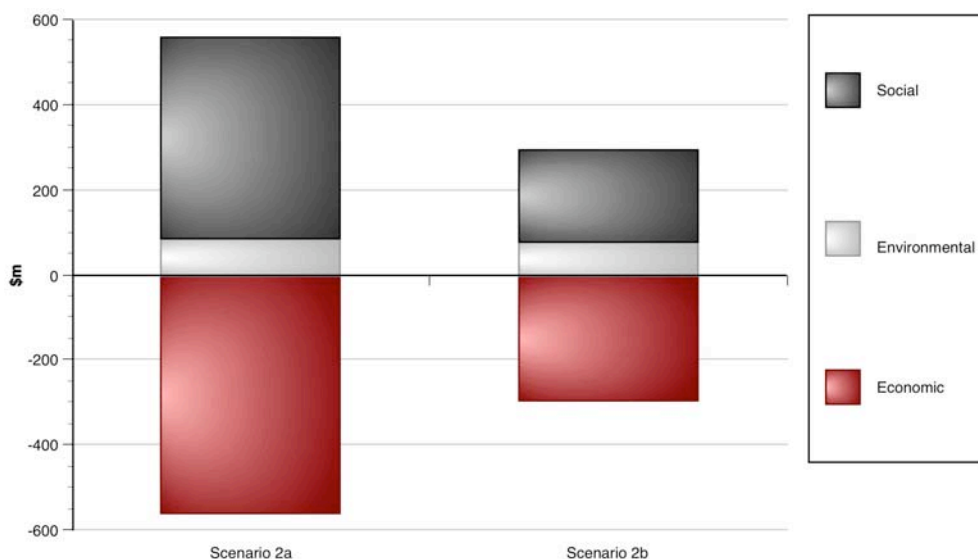
ALTERNATIVE PROPOSAL: PRESENT VALUE OF COSTS AND BENEFITS

	PV Costs (\$m)	PV Benefits (\$m)	NPV (\$m)	Littered bags (millions)
High take-up (2a)	-\$560	\$85	-\$475	-135
Modest take-up (2b)	-\$295	\$77	-\$219	-122

Note: Present values are calculated using a 7 per cent discount rate for costs and benefits between the years 2006 and 2016 inclusive.

The net costs can also be thought of as the size that the social benefit would need to be to justify the policy on a cost-benefit basis (see Figure 3.6).

Figure 3.6

ALTERNATIVE PROPOSAL: COSTS, BENEFITS AND IMPLIED SOCIAL BENEFIT 'GAP'**Further observations**

This analysis relies critically on the assumption that participating retailers will meet their targets, despite the rising costs associated with doing so. The rising costs are linked to the fact that retailers are continuing to use suasive measures to encourage consumers to use LWPB alternatives. If retailers changed their voluntary methods (for example, by introducing a transparent charge for plastic bags, or by *only* providing plastic bag substitutes) they would be able to reduce the provision of plastic bags in a more cost-effective manner.

This option has not been modelled, because it is not possible to know the extent to which retailers would voluntarily introduce a transparent charge. Retailers currently do not generally charge for plastic bags, and it is uncertain whether this is done because it is more time or cost efficient not to directly charge for them, or because retailers are concerned about losing market share to their competitors if they are the first to introduce the charge. These possibilities would need to be considered in relation to this option.

Appendix A

Aligning the baselines

The baseline used in the analysis for EPHC assumed no further action by governments and industry. The EPHC analysis also examined a scenario, which extended the ARA Code of Practice. The assumptions for the extension of the ARA Code were that all large retailers and half of all medium and small retailers would meet a 50 per cent reduction in the first year of implementation, and maintain it from then onward. These assumptions meant that the extension of the ARA Code went above and beyond what has currently been achieved to date.

The baseline for this supplementary analysis assumed a continuation of effort at current levels — similar, but *less than* the impact of the scenario modelled as the extension of the ARA Code, as stipulated by the steering group for the EPHC report. As a result, neither Scenario 2 nor Scenario 3 from the previous analysis could be used for this analysis, and a ‘mid-way’ baseline was developed in order to reflect the continuation of government and industry effort at voluntary levels, as specified in the supplementary briefing.

Not only does the baseline that is used in the supplementary analysis assume a lower level of industry engagement than was assumed in Scenario 3, but the scenarios examined also assume a lower level of engagement among retailers than was assumed in Scenario 3.

The impacts of Scenarios 1a, 1b, 2a and 2b in this analysis are therefore generally smaller than the impact of Scenario 3 in the EPHC analysis, because they represent a smaller change from the assumed ‘default’ position. In order to compare the options against the same baseline, the impacts of Scenarios 1a, 1b, 2a and 2b are shown in comparison to the ‘no further action’ baseline that was used in the EPHC analysis (see Table A.1). Estimates of the ‘social gap’ necessary to justify the implementation of the scenarios on a cost-benefit basis are shown in Figure A.1.

Table A.1

PRESENT VALUE OF COSTS AND BENEFITS, COMPARED TO NO FURTHER ACTION

	PV Costs (\$m)	PV Benefits (\$m)	NPV (\$m)	Littered bags* (millions)
High take-up (1a)	-\$562	\$170	-\$392	-111
Modest take-up (1b)	-\$430	\$154	-\$276	-102
High take-up (2a)	-\$799	\$93	-\$706	-148
Modest take-up (2b)	-\$535	\$84	-\$450	-134
Scenario 3 (EPHC)	-\$646	\$156	-\$490	-233

Note: Present values are calculated using a 7 per cent discount rate for costs and benefits between the years 2006 and 2016 inclusive.

* Includes biodegradable bags.

Initial impacts to stakeholders — retailers, households, government and so on — are not estimated for these scenarios in comparison to no further action. They are likely to be marginally higher than the impacts shown in Chapter 2 and Chapter 3, but not as high as if the impacts calculated for Scenario 3 were added to the impacts shown in Chapter 2 and Chapter 3.

Figure A.1

ALTERNATIVE BASELINE: COSTS, BENEFITS AND IMPLIED SOCIAL BENEFIT 'GAP'