

COAG STANDING COUNCIL ON
ENVIRONMENT AND WATER

**PACKAGING IMPACTS
CONSULTATION REGULATION
IMPACT STATEMENT**

NOVEMBER 2011

This document is available on the website
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Web copy: ISBN ????

Print copy: ISBN ????

A publication of the Standing Council on Environment and Water

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ACRONYMS

ACCC	Australian Competition and Consumer Commission
ADF	Advance Disposal Fee
AWT	Alternative Waste Technology
BCR	Benefit Cost Ratio
C&I	Commercial and Industrial
CBA	Cost Benefit Analysis
CDS	Container Deposit Scheme
COAG	Council of Australian Governments
EPHC	Environment Protection and Heritage Council (now SCEW)
MRF	Material Recovery (/Reclamation) Facility
MS2	Martin Stewardship and Management Strategies
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NPV	Net Present Value
PSO	Product Stewardship Organisation
PV	Present Value
PwC	PricewaterhouseCoopers
RIS	Regulation Impact Statement
RVM	Reverse Vending Machine
SCEW	Standing Council on Environment and Water (formerly EPHC)
WCS	Wright Corporate Strategy

GLOSSARY

Advance disposal fee (ADF): Government excise imposed on industry to fund initiatives aimed at increasing packaging recovery and recycling and reducing packaging litter.

Alternative Waste Technology (AWT): Refers to methods of waste management and disposal that offer a more sustainable solution than landfill, thus reducing environmental impact. AWT can include mechanical separation methods, biological processes, thermal technologies and mechanical biological treatment.

At home consumption: Consumption that occurs in the household, including **consumer packaging**. It excludes consumption in offices, industry, hospitality venues, institutions, shopping centres and public places.

Australian Packaging Covenant: The Australian Packaging Covenant, formerly the **National Packaging Covenant**, is the voluntary component of a co-regulatory arrangement for managing the environmental impacts of consumer packaging in Australia. Brand owners can choose to join the Covenant or comply with the relevant state based **National Environmental Protection (Packaging Materials) Measure (NEPM)**.

Away from home consumption: Consumption that occurs in offices, industry, hospitality venues, institutions, shopping centres and public places. It includes **consumer packaging** and associated **distribution packaging**. It does not include **at home consumption**.

Away from home recycling: Using materials/products recovered from offices, industry, hospitality venues, institutions, shopping centres and public places as raw materials to produce other products. It does not include **kerbside recycling**.

Base case: The 'business as usual' scenario that occurs in the absence of government intervention.

Benefit Cost Ratio (BCR): One of the key outputs of a **Cost Benefit Analysis (CBA)**, used to compare the net benefit to society of a particular option. The BCR is measured as the ratio of the **Present Value (PV)** of **incremental benefits** (relative to the **base case**) over the evaluation period to the present value of **incremental costs**.

Beverage containers: manufactured from rigid or flexible materials including glass, plastics, steel and aluminium. They carry liquids for human consumption.

Commercial and Industrial (C&I) waste: Refers to waste produced by commercial and industrial business and enterprises, government agencies and institutions.

Consumer packaging: Refers to all packaging products made of any material or combination of materials, for the containment, protection, marketing and handling of consumer products. This includes **distribution packaging**. Consumer packaging is also often referred to as **sales packaging**.

Consultation Regulation Impact Statement (RIS): A Consultation RIS is a document that details a regulation impact assessment process for consultation with stakeholders. A Consultation RIS is generally followed by a Decision Regulation Impact Statement. A CRIS involves identifying the problem requiring government intervention, the proposed options for addressing the problems, the impacts of different options and consultation with stakeholders.

Container deposit legislation (CDL): See **Container deposit scheme**

Container deposit scheme (CDS): A deposit is levied on the sale of a product sold in a container. The deposit is refunded to the consumer after the product has been used and when the container is returned to a designated public redemption point. CDSs are most often confined to beverage containers, and some CDSs, such as that operating in South Australia, exclude (plain) milk and wine containers. A CDS is also known as **Container Deposit Legislation (CDL)**.

Cost Benefit Analysis (CBA): An analytical tool that compares the impacts of proposed options for government intervention that to address identified problems, relative to a 'business as usual' scenario (the **base case**). Economic costs and benefits are examined from the perspective of the community as a whole to help identify the proposal with the highest net benefit. Where possible, they are monetised and discounted to convert them to their **Net Present Value (NPV)** for comparative purposes.

Distribution packaging: Refers to packaging that contains multiples of products (the same or mixed) intended for direct consumer purchase. This includes:

- **Secondary packaging** used to secure or unitise multiples of consumer product, for example, cardboard box, shipper, shrink film overwrap
- **Tertiary packaging** used to secure or bundle multiples of secondary packaging, for example, pallet wrapping stretch film, shrink film, strapping.

Flexible packaging refers to non-rigid packaging. The majority of flexible packaging is paper/cardboard and film plastics. Both are used extensively in **grouped packaging** and **transport packaging**.

Free rider: An individual or company who benefits from a good or a service without paying for it. In the context of packaging policy options, this usually refers to companies/groups that, under the principles of product stewardship, should be held accountable for the environmental impacts of packaging, but do not contribute to programs/initiatives designed to address the environmental impacts of packaging.

Grouped packaging: Packaging which constitutes, at the point of purchase, a grouping of a certain number of sales units, whether the latter is sold as such to the final user or whether it serves only as a means to replenish the shelves at the point of sale. Grouped packaging can be removed from the product without affecting the characteristics of the product. Grouped packaging is sometimes referred to as **secondary packaging**.

Hub and spoke: A hub and spoke-based system is one that operates with a large centre which leads the system (the hub) and a series of smaller centres (the spokes) which operate parts of the system under the leadership of the hub. This is the structure of the recycling facilities in the proposed Boomerang Alliance CDS.

Incremental benefits and costs: In a CBA, the benefits and costs of the options to address identified problems are measured on an incremental basis relative to the 'business as usual' scenario (the **base case**).

Kerbside recovery: Roadside collection of domestic solid waste. Waste may be sorted for recycling or otherwise prior to collection.

Kerbside recycling: Using materials/products recovered from roadside collections as raw materials to produce other products.

Litter: The intentional or unintentional discard of end of life packaging, products or other items into the environment, for example, due to over-full receptacles or uncovered bins/vehicle loads.

Material Recovery Facility (MRF): Sometimes referred to as a Materials Reclamation Facility, a MRF is a specialised (mechanical) plant that receives, separates, and prepares recyclable materials for marketing to end-user manufactures for reprocessing.

Municipal waste: Domestic waste from households, usually disposed of via roadside collection.

National Environment Protection Measure (NEPM): National Environment Protection Measures (NEPMs) are designed to improve national consistency in environmental protection outcomes. Measures are made under the National Environment Protection Council (NEPC) Act by Commonwealth, State and Territory environment ministers.

National Environment Protection (Used Packaging Materials) Measure 2011 (NEPM): The Used Packaging Materials NEPM is a regulatory safety net designed to prevent industries in the packaging chain that choose not to participate in the Australian Packaging Covenant from gaining a competitive advantage.

National Packaging Covenant: See **Australian Packaging Covenant**

National Waste Policy: The National Waste Policy, which was agreed to by all Australian environment ministers in November 2009 and endorsed by the Council of Australian Governments (COAG) in October 2010, sets out a coherent approach to Australia's waste management and resource recovery.

Net Present Value (NPV): One of the key outputs of a **CBA**, used to compare the net benefit to society of a particular option. The NPV is measured as the difference between the **Present Value (PV)** of incremental benefits (relative to the **base case**) over the evaluation period and the present value of incremental costs.

Non-beverage containers: Containers used for grocery products such as foods, household and commercial liquids and powders. Common material types include glass, steel and plastic.

Packaging: Packaging plays a vital role in the consumer goods sector by protecting and preserving raw materials and products as they move through supply chains. The roles of packaging include protecting products; promoting products; providing consumer information on usage, health, safety and disposal etc.; allowing for unitisation of products for wholesale distribution; maintaining the integrity of products and supporting the efficient handling of products throughout the supply chain.

Product Stewardship: The concept of shared responsibility by all sectors involved in the manufacture, distribution, use and disposal of products.

Product Stewardship Organisation (PSO): An organisation established by industry participants, some of whom may be competitors, to deliver a product stewardship function for products or materials on their collective behalf.

Product Stewardship Scheme: A product stewardship scheme tends to be designed around the idea that producers of products and packaging should bear responsibility for the management of packaging waste. This could involve industry establishing an organisation to operate the scheme and charging membership fees (similar to an ADF arrangement) to members, which are used to fund initiatives aimed at increasing packaging recovery and recycling and reducing packaging litter.

Recovery: Collecting solid waste that can be sorted and processed for recycling.

Recyclate: Material that has been collected, sorted and prepared (e.g. by removing contaminants) for incorporation into a new product (not necessarily packaging).

Recycling: Using recovered products/materials as raw materials to produce another product. The recovered material is called **recyclate**.

Reprocessing: See **recycling**.

Resource recovery: See **recovery**.

Reuse: To use products and materials again in their original state without reprocessing or remanufacture.

Reverse Vending Machines (RVMs): RVMs are used in CDSs as deposit points. Packaging is inserted in to the RVM and then scanned, sorted by material type and processed by the RVM (glass bottles and aluminium cans are crushed, plastic bottles are shredded) into separate bins to minimise storage requirements.

Rigid packaging: Packaging made from non-malleable materials such as glass or steel.

Sales packaging: See **consumer packaging**

Secondary packaging: See **distribution packaging** and **grouped packaging**.

Transport packaging: Transport packaging is designed to facilitate handling and transport of a number of sales units, unitised or grouped packaging in order to maintain unit integrity, and prevent physical damage during handling and transport. Transport packaging does not include road, rail, ship and air containers. Transport packaging is sometimes referred to as **tertiary packaging**.

EXECUTIVE SUMMARY

The purpose of this Consultation Regulation Impact Statement (RIS) is to explore a limited number of measures that have the potential to increase packaging resource recovery rates and decrease packaging litter.

THE PROBLEMS

The key problem with the current state of packaging consumption and recycling in Australia is that Government objectives for reduced waste and increased resource recovery are not being met due to the low or suboptimal rates of recycling for glass, plastic, steel and aluminium in the commercial, hospitality and institutional sectors (away-from-home). This leads to loss of resources, increased use of landfill and environmental externalities including litter.

Associated with this, there is a potential for increasingly fragmented jurisdictional approaches which add to regulatory complexity, increase business costs and uncertainty for investment and fragment end-markets. The resultant inconsistency and duplication hinder the efficient operation of businesses operating in a national market.

Continued improvements in recycling rates will rely on local government who provide municipal services. The current disparity in provision of services across urban, regional and rural settings illustrates that an expansion and improvement of these services cannot be assumed.

OBJECTIVES

The objectives of government action are to:

- reduce packaging waste and increase packaging resource recovery
- reduce the need to landfill recyclable packaging materials
- reduce the negative amenity, health and environmental impacts of packaging waste and litter in line with community expectations, and
- promote a consistent national approach to regulating packaging.

OPTIONS TO ADDRESS THE PROBLEMS

Options considered in this Consultation RIS are:

- Option 1: National Waste Packaging Strategy
- Option 2: Co-regulatory Packaging Stewardship, with three specific sub-options
 - 2 (a): the Australian Packaging Covenant replaced by co-regulation under the *Product Stewardship Act 2011* (the Act)
 - 2 (b): Industry Packaging Stewardship
 - 2 (c): Extended Packaging Stewardship
- Option 3: Mandatory Advance Disposal Fee (ADF)
- Option 4: Mandatory Container Deposit Scheme (CDS), with two specific sub-options
 - 4 (a): Boomerang Alliance CDS
 - 4 (b): Hybrid CDS

IMPACT ANALYSIS

Current arrangements in place across Australia to deal with packaging and other recyclable materials represent the base case for this analysis. The base case includes jurisdictional arrangements for municipal and commercial and industrial (C&I) recycling, container deposit schemes operating in South Australia and soon to be implemented in the Northern Territory, the Australian Packaging Covenant arrangement, and other voluntary industry actions.

PricewaterhouseCoopers (PwC) undertook the cost-benefit analysis (CBA) for this Consultation RIS based on the following general assumptions that apply across all of the options:

- **Incremental basis**
Option costs and benefits are measured incrementally relative to the base case.
- **Base year of the appraisal: 2010-11**
Monetised values are expressed in 2010-11 dollars unless otherwise stated.
- **Evaluation period: 25 years, from 2010-11 to 2034-35**
The total period of evaluation needs to be long enough to capture all potential costs and benefits of the proposal.
- **Real discount rate: 7 per cent**
All future cost and benefit cash flows are discounted to 2010-11 dollars using a real discount rate of 7 per cent.

KEY RESULTS OF THE CBA

Table E.1 below provides a summary of the key results of the CBA, based on market values and non-market values that could be monetised (i.e. landfill externalities). The table presents the estimated present value costs and benefits, net present value (NPV) and benefit-cost ratio (BCR) for each of the options.

TABLE E.1: CBA RESULTS BASED ON MARKET-BASED VALUES (AND LANDFILL EXTERNALITIES)

	Options						
	1	2 (a)	2 (b)	2 (c)	3	4 (a)	4 (b)
Costs (millions)	\$247	\$251	\$553	\$1,107	\$1,104	\$2,066	\$2,439
Benefits (millions)	\$249	\$293	\$528	\$957	\$957	\$708	\$708
NPV (millions)	\$2	\$43	-\$24	-\$150	-\$147	-\$1,358	-\$1,731
BCR (number)	1.01	1.17	0.96	0.86	0.87	0.34	0.29
2035 recycling (tonnes)	4,222,000	4,200,000	4,264,000	4,591,000	4,591,000	4,313,000	4,313,000
2035 litter (tonnes)	30,000	31,000	29,000	25,000	25,000	28,000	28,000
2035 landfill (tonnes)	956,000	977,000	915,000	811,000	811,000	867,000	867,000

The key results of the CBA show that:

- all options result in an overall increase in recycling by 2035
- options 1 and 2 (a) are the only options that have a positive NPV
- all other options were assessed in the CBA as having negative NPVs and BCRs lower than 1. This suggests that for these options, the market costs are greater than the benefits
- options 2 (b), 2 (c) and 3 involve higher costs and benefits than options 1 and 2 (a) and result in small net costs to the economy, and

- options 4 (a) and 4 (b) are the highest cost options and have the lowest BCRs of all the options, indicating they represent the largest net cost to the economy. While these options return the highest benefits, due to savings to the kerbside recycling system and a price premium from materials collected through a CDS, these benefits are outweighed by the overall higher costs.

NON-MARKET BENEFITS

The CBA results do not include all of the non-market values that lead consumers to value packaging recycling and reduced litter, such as environmental benefits or a feeling of civic duty.

In 2010 PwC was commissioned by the Environment Protection and Heritage Council (EPHC) to undertake a study of households' willingness to pay for increased packaging recycling, to quantify these non-market values. In Table E.2 the willingness to pay values for increased recycling are applied across the options being assessed, using the core estimate and lower and upper 95 per cent confidence interval limits. It is not appropriate to add the willingness-to-pay values to the CBA results. The figures below are presented alongside the CBA results to allow for these non-market aspects to be taken into consideration in assessing the overall costs and benefits of the options.

TABLE E.2 - SUMMARY OF WILLINGNESS TO PAY BENEFITS (INCREMENTAL TO BASE CASE, \$MILLIONS, PV)

Willingness to pay for:		Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
Increased recycling	Lower	\$234	\$233	\$422	\$689	\$689	\$465	\$465
	Core	\$296	\$295	\$534	\$872	\$872	\$588	\$588
	Upper	\$403	\$402	\$727	\$1,186	\$1,186	\$801	\$801

CONCLUSION

Given the uncertainty around the assumptions and estimates and some of the benefits, this Consultation RIS does not indicate a preferred option and seeks feedback on these aspects. The consultation process is an important part of the validation process for these assumptions and estimates and an opportunity for the community to put forward additional evidence to support or change the analysis.

CONSULTATION

This document is a Consultation RIS. As such, the Standing Council on Environment and Water (SCEW) seeks your feedback on the data, information and recommendations within this document. Questions have been posed at the end of most chapters to prompt stakeholder feedback.

Written submissions should be sent by 30 March 2012 to:

SCEW.secretariat@environment.gov.au

Standing Council on Environment and Water Secretariat
GPO Box 787 Canberra, ACT 2601

Contact number for general enquiries: (02) 6274 1819

The closing date for submissions is 30 March 2012. Late submissions will not be accepted. 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.

1 INTRODUCTION

Consumer packaging delivers environmental benefits, for example by reducing food waste through spoilage. It also has adverse environmental impacts throughout its lifecycle. In particular, the production and distribution of packaging and packaged goods requires the consumption of large amounts of materials, energy and water. Used packaging also places pressure on the environment: packaging materials that are not recycled end up in landfill or as a key component of litter.

As a result of these environmental impacts and in response to community concerns and values, there has been a long history of consideration by Australia's environment ministers of options for better managing packaging waste and litter. Actions undertaken to date have involved the implementation of three Packaging Covenants (in 1999, 2005 and 2010), which have committed governments and relevant companies to working together to mitigate the negative impacts of packaging. Discussions at ministerial council meetings have also often centred upon a proposal to introduce a national container deposit scheme (CDS), based on the existing South Australian model.

The *National Waste Policy: Less Waste, More Resources* was agreed by all Australian environment ministers in the EPHC in November 2009 and endorsed by the Council of Australian Governments (COAG) in October 2010. The National Waste Policy sets the direction for national action on waste and resource recovery for the period to 2020. Strategy 3 of the National Waste Policy states:

The Australian Government, in collaboration with state and territory governments, industry and the community will better manage packaging to improve the use of resources, reduce the environmental impacts of packaging design, enhance away-from-home recycling and reduce litter (EPHC 2009, p. 10).

At the EPHC meeting on 5 July 2010, ministers agreed to develop a Consultation RIS on a limited number of measures that have the potential to increase packaging resource recovery rates and decrease packaging litter, addressing Strategy 3 of the National Waste Policy. The measures that ministers agreed to consider included a national CDS, advance disposal fee, and workplace, events, hospitality and institutions recovery. It was also agreed that the RIS process would be transparent and consultative, and that the scope and approach would be the subject of early engagement with key stakeholders.

This Consultation RIS has been developed to deliver upon these commitments. Substantial stakeholder consultation has been undertaken throughout its development, including direct discussions with key stakeholders and two broad stakeholder workshops (held in December 2010 and July 2011). SCEW met on 30 November 2011 to consider release of the Consultation RIS.

PURPOSE OF THE CONSULTATION RIS

COAG's *Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies* (2007) sets out principles to guide regulatory processes managed by ministerial councils, which include the following:

- establishing a case for action before addressing a problem
- considering a range of feasible policy options, including self-regulatory, co-regulatory and non-regulatory approaches, and assessing their benefits and costs
- not unduly restricting competition
- consulting effectively with affected key stakeholders at all stages of the regulatory cycle, and

- ensuring that government action is effective and proportional to the issue being addressed.

In line with these principles, this Consultation RIS:

- provides background and context on the packaging supply chain in Australia (Chapter 2)
- describes the nature and extent of the problems with packaging (Chapter 3)
- outlines the government objectives for action (Chapter 4) and non-regulatory and regulatory options to address the problems (Chapter 5)
- assesses the potential impacts of the identified non-regulatory and regulatory options, including the costs and benefits to the Australian economy and any risks (Chapter 6), and
- outlines the process for consultation on the impact assessment (Chapter 7).

Questions to prompt stakeholder feedback and possible areas for further input and examination are identified throughout the Consultation RIS.

2 BACKGROUND AND CONTEXT

Packaging is used to contain, preserve, protect, promote and distribute products. It plays an essential role in the supply chain for most products and can help reduce waste by minimising damage to products and extending shelf life. There is an extensive suite of items that can be reasonably classified as packaging as there is a wide range of packaging materials and types.

Packaging has a complex life cycle that can be divided into three phases: manufacture, use and end of life. Packaging is used for products that are consumed in a range of settings, both at home and away from home. 'At home' refers to residential locations and 'away from home' refers to all non-residential locations where packaging is consumed including workplaces, shopping centres, hospitality venues, institutions and public spaces.

Consumption of packaging has remained relatively steady, increasing from approximately 4.2 million to 4.4 million tonnes over the period 2003 to 2010. Growth in packaging waste in tonnes is tracking at 58.8 per cent of population growth.

While these figures measure packaging in terms of weight, there are no reliable estimates of the total number of packaging items that is produced or consumed in Australia. However, some indication of the scale of packaging consumption can be estimated from the amount of rigid containers in an average shopping basket. A recent study points to the average Australian weekly shopping basket as having around 45 rigid containers (ACIL Tasman 2011, p. 5), or around 2,340 per household per year. ABS estimates Australia's population contains 8.5 million households¹ in 2011 (ABS 2010), making a total of 19.9 billion rigid containers from weekly grocery shopping alone. As this only covers rigid containers consumed at home, the number of packaged items consumed in Australia would be larger.

A range of factors influence Australia's approach to managing the environmental impacts of packaging including global approaches, commonwealth, state and territory policies, and community expectations.

Given the rate at which the packaging industry is changing, it is essential that future policy settings are flexible and have the capacity to address issues as they evolve.

2.1 PACKAGING MANUFACTURE

Product manufacturers and brand owners in a number of diverse industry sectors commission the manufacture of packaging to meet product specifications. The key materials used to manufacture packaging are paper, cardboard, glass, plastics and metals.

Table 1 shows the consumption of different packaging materials in 2009-10. Over 60 per cent of packaging by weight is manufactured from paper or cardboard and 22 per cent by weight is manufactured from glass. Australia follows international trends in packaging manufacture so the relative contribution of these materials to the amount of packaging consumed is likely to change. Overseas trends point to the increasing use of plastics to manufacture multi-layered plastic containers, pressure formed or thermoformed trays, purse packs, pouches and plastic shrink labelling.

¹Table 1.1, Series I estimate.

TABLE 1: PACKAGING CONSUMPTION BY MATERIAL 2009-10

Packaging material	Consumption (tonnes)	Percentage of total (%)
Paper/cardboard	2,680,000	60.6
Glass	991,000	22.4
Plastics	565,285	12.8
Steel cans	136,249	3.1
Aluminium	51,600	1.2
Total	4,424,134	100.0

Source: APCC 2011, p. 21.

Manufacturing packaging uses resources, some of which are non-renewable (such as oil, iron ore and bauxite). Extraction of resources and the manufacture and distribution of packaging also consumes energy, producing greenhouse gas emissions, and water. Consequently, there are environmental externalities associated with packaging manufacture, which can be reduced by recovering and recycling packaging materials (environmental externalities are discussed in more detail in Chapter 3).

PACKAGING MANUFACTURE TRENDS

The packaging industry is concerned with marketability, product competitiveness and safety (Frost 2005). Manufacturers seek to produce packaging that is eye-catching and attractive to consumers, that is easy and efficient to pack and transport, and that maintains product freshness and integrity, all while keeping costs low. Strategies employed to achieve this include concentrating products so that a smaller container will last longer, as with fabric softener or dishwashing detergent, and switching from heavy packaging like glass or steel cans to lightweight plastics and flexible pouches (Streeter 2007). Another strategy is lightweighting which involves reducing the volume of material used to make packaging, such as using less glass to manufacture wine bottles (Good Design Australia 2010). These changes to product and packaging also lead to savings elsewhere in the production line as smaller, lighter packaging results in lower transport costs (Good Design Australia 2010).

Product freshness is a critical issue for the food sector. Appropriate packaging plays a role in reducing and preventing food waste and increasing food security. Packaging manufacturers have been innovative in their efforts to respond to changing demands, and the evolution of new methods and technologies has been almost constant (Manalili, Dorado & van Otterdijk 2011). This has included the development of nanotechnology which aims to add an 'intelligent function' to food packaging in an effort to ensure integrity and microbial safety (FAO/WHO 2009).

Some trends within the packaging industry may run counter to efforts to reduce packaging and increase recycling. According to the American Packaging Association single serve containers are an emerging packaging trend. Consumers are seeking 'grab and go' convenience and are increasingly looking to packaging to assist with portion control (Ferre 2010).

Traditional rigid packaging materials are being replaced by more flexible packaging options such as soft film plastics, particularly in the food industry. This market share is expected to continue to grow film plastics are cheap to produce and have increased flexibility (Manalili, Dorado & van Otterdijk 2011). They are also

considerably less bulky. However, reducing packaging bulk through the use of soft plastics and pouches impacts on recycling because current recycling services are limited as to what materials they can process (Frost 2005). Many of the more traditional packaging materials such as glass, aluminium and steel are easy to recycle into new packaging materials. However, much of the newer, lighter packaging is made up of complex blends of plastics and other materials which are currently very difficult to separate (Environmental Leader 2008). It remains to be seen whether the benefits of new packaging materials are sufficient to outweigh the reduced recyclability on a lifecycle basis.

There are contradictions caused by government legislation and requirements, such as health and safety regulations, which require some products to be manufactured from virgin materials, because reuse or recycling are not considered hygienic or safe.

2.2 BUSINESS AND CONSUMER PACKAGING USE

Packaging facilitates the movement of products through the supply chain to the consumer and must meet the requirements of stakeholders at different stages in the supply chain including wholesalers, retailers and consumers. There are usually several layers of packaging used:

- primary packaging contains a product until it is consumed (also called consumer or retail packaging),
- secondary packaging secures multiple units of a product to facilitate transport and storage, and
- tertiary packaging secures products for transport and storage (also called transport packaging).

Primary packaging is typically discarded when a product has been consumed and disposed of at the place of consumption.

BUSINESS AND CONSUMER PACKAGING USE TRENDS

Consumers are expressing more interest in the environmental impacts of their purchases, and are actively looking for more environmentally friendly options. They are demanding more choice and functionality from packaging, such as devices that are easy to open whilst also being tamper-evident and child resistant (Frost 2005). However, cost, convenience and quality are also important considerations for consumers. Manufacturers are acutely aware of changes in consumer desires and it is in their interests to be innovative in their efforts to respond.

A recent global study by Datamonitor (cited in Westwick-Farrow 2011) found that increased environmental awareness of consumers does not translate into changes in grocery purchasing behaviour except where packaging is concerned. This shows that consumers will actively seek out environmentally friendly packaging, because it is an easy and efficient way for them to feel that they are doing something positive for the environment. It also indicates that efforts by manufacturers to reduce packaging and demonstrate environmental awareness in the marketplace are being noted and embraced by consumers (Streeter 2007).

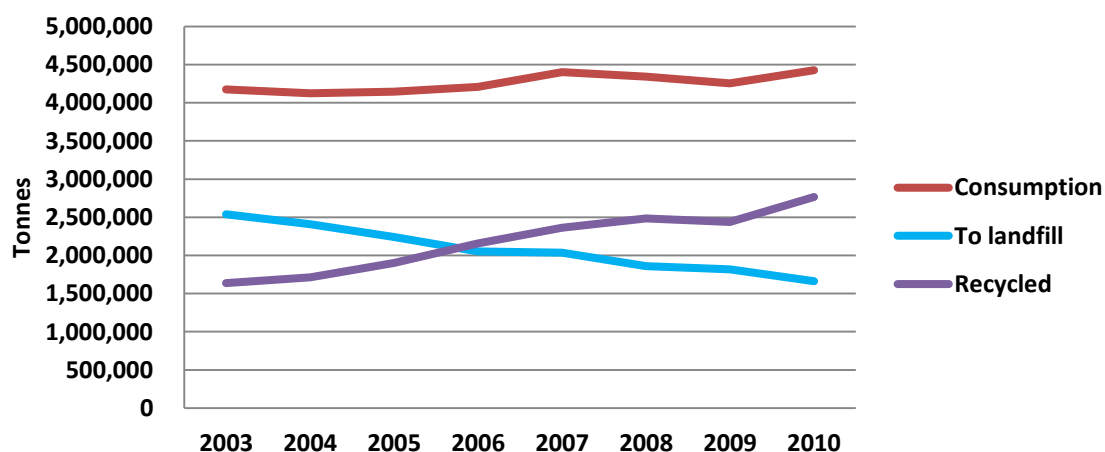
2.3 END OF LIFE PACKAGING RECOVERY

Following consumption, packaging enters the waste stream where it is recovered for recycling or sent to landfill. Figure 1 illustrates trends in packaging consumption, recycling and disposal to landfill between 2003 and 2010.

In 2010, 62.5 per cent of packaging was recycled. The amount of packaging recycled has increased by 69 per cent from a base of 39 per cent in 2003. This can be attributed to heightened awareness of the environmental impacts of packaging amongst brand owners and consumers, better recovery of recyclable materials by industry and governments, improved recycling infrastructure and the expansion of recycling services to commercial, industrial and community areas (APCC 2011, p.11).

Packaging that has entered the waste stream and has not been recovered for recycling is sent to landfill for final disposal. In 2010, 1.66 million tonnes of packaging was disposed to landfill in Australia. The amount of packaging sent to landfill has decreased by 34.5 per cent since 2003 while packaging consumption rates have remained relatively stable during the same period (APCC 2011, p. 11). Ongoing improvements to recovery technologies and services will enable further reductions in the quantity of packaging sent to landfill (APCC 2011, p. 14). For example, improved technology is making it possible to sort and recycle plastic film (including plastic bags, kitchen wrap and shrink wrap) which has traditionally been sent to landfill due to difficulties sorting the materials by plastic type (EPHC 2010a, p. 167).

FIGURE 1: PACKAGING CONSUMPTION, RECYCLING AND DISPOSAL TO LANDFILL 2003-2010



Source: Based on data supplied by the Australian Packaging Covenant.

Recovery refers to the collection of solid waste that can be sorted and processed for recycling. Recovery and recycling differs between ‘at home’ and ‘away from home’ locations. Table 2 shows packaging recycling performance by consumption location and material type.

TABLE 2: RECYCLING PERFORMANCE BY CONSUMPTION LOCATION AND MATERIAL TYPE (2009-10)

Packaging material	Consumption (tonnes)	‘At home’ recycling (%)	‘Away from home’ recycling (%)	Total recycling (%)
Paper/cardboard	2,680,000	75.6	75.5	75.5
Glass	991,000	53.8	26.6	47.0
Plastics	565,285	51.7	23.1	34.8
Steel cans	136,249	37.0	14.6	30.3
Aluminium	51,600	77.5	57.3	67.4
Total	4,424,134	60.0	64.0	62.5

Source: See Attachment A, pp. 73-87.

AT HOME

At home, consumers generally sort their general waste from recyclables and this is collected by the kerbside collection service provided by their local government. The waste is then processed for recycling according to the capacity of service providers and the availability of necessary infrastructure. The capacity to process recyclable materials varies across local government areas (see Attachment A, pp. 48-72). For example, one local government area may have the capacity to recycle all plastics, paper and cardboard, while another local government area nearby may have the capacity to recycle all paper and cardboard but not all plastics. Therefore, in some areas materials recovered for recycling may be diverted to landfill.

Levels of contamination in kerbside recovery also impact on recycling rates. Contamination occurs when non-recyclable materials are disposed of incorrectly in recycling bins. Common contaminants include waxed cardboard, greasy pizza boxes and motor oil containers (EPHC 2010a, p. 168). Contamination is also caused by broken glass which can be difficult to sort from other materials for recycling. Contamination of recyclable materials can compromise the quality of the end product which impacts on the potential to use the recovered materials to manufacture new products. The extent of contamination in kerbside recovery depends on consumers' level of awareness of kerbside recovery systems and the information made available to them by local government. The capacity of municipal waste providers to recycle materials with certain levels of contamination depends on the technology available at processing facilities.

Recycling rates for aluminium cans and paper and cardboard packaging collected at home is relatively high, exceeding 75 per cent. Recycling of glass and plastic packaging collected at home is over 50 per cent which is significantly higher than 'away from home' locations (see Table 2). This indicates that consumers seem to have a good understanding of the inclusion of these materials in kerbside recovery. The recycling rate for steel cans collected at home is moderately low at 37 per cent.

It should also be noted that local government, which has primary responsibility for the collection of materials at home for recycling, is at the end of the supply chain and has limited influence over decisions relating to packaging manufacture and use. Transferring some of the responsibility to manufacturers and users has the potential to promote greater recycling and reduce environmental impacts.

AWAY FROM HOME

In most urban 'away from home' locations, such as workplaces, shopping centres, hospitality venues, institutions and public spaces. Waste is typically collected by private waste service providers. Recycling services are usually offered by private service providers but can be more expensive than general waste disposal to landfill. This can remove the incentive for some businesses to sort recyclable materials for recovery. There are other barriers to recycling that can also impact on recovery at 'away from home' locations. For example, in offices and small businesses there is often limited physical space and therefore insufficient room for storing multiple waste bins. Also, some offices and small businesses are not offered recycling services by private waste service providers.

Waste in public spaces such as parks and reserves is generally collected local government. As with kerbside collection at home, the capacity for recovery depends on local government waste systems, the provision of separate recycling bins and the availability of necessary infrastructure for processing. For example, a park in one local government area may have separate bins for recyclables and general waste, while a park nearby in a different local government area may have a single bin for all waste. This lack of consistency can cause

confusion for consumers who encounter differing waste systems as they visit multiple public places across different local government areas.

Inconsistencies can also cause confusion for consumers in away from home locations. For example, some shopping centres may have no recycling or general recycling bins while others may have recycling bins specifically for beverage containers that are not designed to collect non-beverage containers. This creates confusion for consumers and can make it difficult for them to participate in the recovery of recyclable materials which can consequently reduce recovery rates.

‘Away from home’ recycling for paper and cardboard packaging is relatively high, exceeding 75 per cent. This is due in large part to recycling initiatives in the C&I sector. Recycling rates for aluminium cans ‘away from home’ is 57 per cent which is driven in part by the high material value. Recycling rates for plastic (23 per cent) and glass (27 per cent) are relatively low in ‘away from home’ locations, potentially due to more dispersed collection points, glass breakage and the low value of contaminated mixed glass.

Low or suboptimal rates of packaging recycling ‘away from home’ can lead to the loss of valuable resources and environmental benefits associated with recycling or resource recovery. According to the *National Waste Report 2010*, for resource recovery to be environmentally beneficial on a whole of life cycle basis, the benefits associated with avoided resource use and landfill capacity need to offset the impacts associated with material collection and re-processing. Transport distances, the type of reprocessing technology used, avoidance of process flows for virgin products and existing landfill capacity will influence whether recycling is environmentally beneficial (EPHC 2010a, p. 165). For any life cycle analysis of recycled material, assumptions need to be made about the process flows for both recycling and avoided process flows for virgin material manufacturing. Different assumptions will lead to different findings. The net benefits of recycling a tonne of packaging material are shown in Table 3.

TABLE 3: NET BENEFITS OF RECYCLING A TONNE OF PACKAGING MATERIALS

Material	Resource	Greenhouse gases (tonnes CO ₂ e)	Cumulative energy demand (GJ LHV)	Water use (kl)
Paper / cardboard	Wood	0.6	9.3-10.8	25.4-28.3
Glass	Sand	0.6	6.1-6.9	2.3-2.4
Plastics ²	Oil	0.8 – 2.0	38.8-63.0	(22.6) – 71.3
Steel Cans	Iron ore	0.4	8.0	(2.4)
Aluminium cans ³	Bauxite	15.9 – 17.7	171.1 – 191.4	181.8 - 202.0

Source: DECCW NSW 2010, p. 14.

It is estimated that increasing packaging recycling from 62.5 per cent to 85 per cent would, on a per annum basis, save:

- greenhouse gases: 850,000 to 1.1 million tonnes of CO₂e
- energy: 16.5 to 22.0 million GJ, and
- water: 17,000 to 36,000 MI (Attachment A, p. 36).

² The range of estimates represents the location of recycling and the type of plastic.

³ The range of estimates represents the location of recycling (i.e. kerbside versus commercial and industrial).

While these figures present a global perspective on packaging recycling, the benefits differ for each material type.

Glass can be recycled many times over without loss of properties (EPHC 2010a, p. 167). Recycled glass is crushed to form cullet, which can be used for further glass making. Most new glass contains between 40 per cent and 70 per cent cullet. There is a 57 per cent energy saving associated with recycled glass compared to the manufacture of glass from virgin materials. Glass is considered to be environmentally beneficial in terms of energy if recycling occurs within 100 kilometres of collection (EPHC 2010a, p. 167).

Plastics are many and varied, so the environmental and other impacts associated with their recycling will also vary. Most recycled plastics have a net energy benefit, but some plastics require greater water use in their recycling than in their original manufacture.

Metals like steel and aluminium can be recycled many times over without loss of properties (EPHC 2010a, p. 165). Recycling aluminium saves up to 95 per cent of the energy required for primary aluminium production, making recycling highly economic. In 2008, aluminium recycling was estimated to save 4.93 million tonnes of CO₂e greenhouse gases. This figure includes the recycling of all aluminium scrap, not just used aluminium cans (EPHC 2010a, p. 165).

END OF LIFE PACKAGING RECOVERY BY FUNCTION

The recovery and recycling rate can also be measured in terms of the packaging function. A common form of measurement is to distinguish beverage containers from non-beverage containers. In Australia, the ‘away from home’ recycling rate is high for flexible packaging (as this is predominantly cardboard packaging consumed in commercial settings, for which there is a strong market incentive to recover for recycling). However, the ‘away from home’ recycling rate for beverage containers is very low, as Table 4 illustrates. This low recycling rate has many causes including the cost associated with away-from-home recycling services, the absence of economies of scale, a lack of infrastructure for multiple bins in some locations, lack of transfer stations to sort recovered materials and a lack of understanding by businesses.

TABLE 4: ESTIMATED AT HOME/AWAY FROM HOME SPLIT BY PACKAGING FUNCTION

Class	At-Home			Away-From-Home		
	Consumption (tonnes)	Recyclate (tonnes)	Recycling (per cent)	Consumption (tonnes)	Recyclate (tonnes)	Recycling (per cent)
Beverage containers	771,000	463,000	60.0	331,000	74,000	22.3
Non-Beverage containers	251,000	90,000	35.9	107,000	53,000	50.1
Flexible Packaging	603,000	422,000	70.0	2,361,000	1,660,655	70.3
Total	1,625,000	975,000	60.0	2,799,000	1,788,000	64.0

Source: See Attachment A pp. 73-87.

2.4 PACKAGING LITTER

Consumed packaging that does not enter the waste stream may be discarded as litter. Keep Australia Beautiful data on litter indicates that packaging makes up a significant proportion of the litter stream in Australia (McGregor Tan Research 2010, pp. 141-143). Data from the Keep Australia Beautiful National

Litter Index shows that the proportion of packaging in the litter stream has gradually decreased since 2006-07 (see Attachment A, p. 14). However, it is estimated that packaging still made up 87 per cent of litter by volume and 34 per cent by item in 2009-10.⁴

Packaging litter has a range of negative impacts on society, including:

- negative visual amenity
- danger to human health, for example, due to injuries from broken glass
- opportunity costs of cleaning up litter, which could be used to fund things more highly valued by society, and
- danger to wildlife (BDA/WCS 2010, p. 50).

2.5 INTERNATIONAL CONTEXT

GLOBAL PRACTICES

The concept of extended producer responsibility for products and packaging has been a feature of the international business landscape for many years. Regulations requiring producers to take responsibility for packaging at end-of-life were introduced in the European Union in the 1990s (EU 1994). The European Parliament and Council Directive 94/62/EC on packaging and packaging waste requires member states to meet targets for recovery and recycling of particular packaging materials and to:

- limit the weight and volume of packaging to a minimum in order meet the required level of safety, hygiene and acceptability for consumers
- reduce the content of hazardous substances and materials in the packaging material and its components, and
- design reusable or recoverable packaging.

Similar regulations have been introduced in countries such as Japan and South Korea. Other countries, such as Singapore and New Zealand, have adopted voluntary agreements similar to that of the Australian Packaging Covenant to address the environmental impacts of packaging. China has introduced policies that require firms to eliminate unnecessary packaging and design packaging for reuse or recycling.

International efforts to promote, define and measure the sustainability of packaging are also being initiated by individual firms and industry associations. The drivers for this activity include cost and regulatory requirements, increasing market demand for more sustainable packaging and the need to provide a consistent framework for industry action. Examples of international industry-led activities include:

⁴ For this study, the following are assumed to be packaging: all metal items, all glass items, paper items (except for junk mail, newspaper, other paper, shopper dockets and tickets), and plastic items (except for lollipop sticks, packaging tape, snack sheeting, spoons/cutlery, straws and wine cask bladders). The following are assumed to be non-packaging: cigarette butts, all miscellaneous items, junk mail, newspaper, other paper, shopper dockets and tickets, lollipop sticks, packaging tape, snack sheeting, spoons/cutlery, straws and wine cask bladders. Illegally dumped litter is excluded.

- the Sustainable Packaging Coalition in the United States which has developed a definition of ‘sustainable packaging’ and associated metrics to help firms measure and report on progress towards creating more sustainable packaging systems (SPC 2011),
- the Packaging Scorecard developed by Wal-Mart to evaluate the environmental performance of packaging used by its suppliers (Wal-Mart 2006), and
- the Consumer Goods Forum, a grouping of the world’s largest consumer goods manufacturers and retailers initiated by the Global Packaging Project in 2009 to develop a common way of measuring sustainability improvements to packaging (SustainaPac 2010).

GLOBAL ECONOMIC CLIMATE

In the past few years, Australian exports of recyclable materials have faced weaker global demand, posing a challenge to Australian recycling markets. Over the past 30 years, China’s strong economic growth has fuelled increased demand for recovered paper and plastics to feed a rapidly expanding manufacturing sector (WRAP 2011 pp. 5-8). However, the financial uncertainties in the USA and Europe are currently weakening demand for Chinese products in these areas. This has a direct link to the quantities of recovered materials sourced from Australia, as this is used to supply the Chinese manufacturing industry (Sheehan 2011, pp. 2-3). The strong Australian dollar poses a further challenge to Australian recycling markets, with the prices of recyclable materials being less competitive (Sheehan 2011, p. 1).

2.6 NATIONAL CONTEXT

A range of factors influence Australia’s approach to managing the environmental impacts of packaging including commonwealth, state and territory policies, and community expectations.

COMMONWEALTH POLICIES

In November 2009 Australia’s environment ministers agreed on a new national policy on waste and resource management. The COAG endorsed National Waste Policy sets the agenda for waste and resource recovery in Australia over the next 10 years. The aims of the National Waste Policy are to:

- avoid the generation of waste; reduce the amount of waste (including hazardous waste) for disposal; manage waste as a resource and ensure that waste treatment, disposal, recovery and reuse is undertaken in a safe, scientific and environmentally sound manner
- contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land.

One of the National Waste Policy’s six key directions is taking responsibility, through product stewardship, to reduce the environmental, health and safety footprint of manufactured goods during and at end of life. The following strategies are of particular relevance under this key direction:

Strategy 1: establish a national framework underpinned by legislation to support voluntary, co-regulatory and regulatory product stewardship and extended producer responsibility schemes to provide for the impacts of a product being responsibly managed during and at end of life (EPHC 2009, p. 9).

Strategy 3: better manage packaging to improve the use of resources, reduce the environmental impacts of packaging design, enhance away from home recycling and reduce litter (EPHC 2009, p. 10).

The *Product Stewardship Act 2011* (the Act) came into effect on 8 August 2011. The Act establishes a national framework to enable Australia to more effectively manage the environmental, health and safety impacts of products, and in particular those impacts associated with the disposal of products.

STATE AND TERRITORY POLICIES

In Australia the states, territories and local government have primary responsibility for management of waste and litter. They utilise a range of different policy approaches including landfill levies, waste reduction targets, voluntary product stewardship programs and legislation that allows for the introduction of extended producer responsibility schemes for priority materials, to meet their obligations (Allen Consulting Group 2009, p. 28). These mechanisms all have some degree of impact on packaging waste and recycling, though they are not always consistent between jurisdictions (see Attachment A).

Some states and territories have specific regulations relating to the environmental management of particular packaging items. South Australia and the Northern Territory have container deposit legislation (CDL) in place, requiring beverage companies to refund a 10 cent deposit when beverage containers that are sold in these jurisdictions are dropped off at collection depots.

COMMUNITY EXPECTATIONS

The *National Waste Report 2010* found that Australians have come to increasingly value waste reduction, recycling and re-use over recent years (EPHC 2010a, p. 225). Evidence shows there is community interest in improving opportunities for recycling in work places and public spaces, and for establishing convenient infrastructure to help the community deal appropriately with waste (EPHC 2010a, p. 217). For example, a Victorian Government survey in 2004 (Ipsos Australia 2005, p. 19) suggested that 92 per cent of people would like to see more recycling bins in parks and shopping areas, while a national survey conducted on behalf of Planet Ark in 2007 by Pollinate Green Research, found that most employees would like to see more workplace recycling bins for plastic packaging (79 per cent) and paper (77 per cent).

The community is strongly committed to kerbside recycling. In the twelve-month period to March 2009, 95 per cent of households had recycled or reused paper, cardboard or newspapers. Other commonly recycled or reused items included plastic bottles (94 per cent), glass (93 per cent) aluminium cans (84 per cent) and steel cans (80 per cent) (ABS 2009a; ABS 2009b).

There is widespread support for more action to reduce the environmental impacts of packaging. According to research undertaken for the mid-term review of the Australian Packaging Covenant, 60 per cent of consumers believe that not enough emphasis is placed on reducing the environmental impact of packaging and 40 per cent think that this is because there is too much packaging used (OmniAccess 2008, pp. 8-9).

AUSTRALIAN PACKAGING COVENANT AND THE NEPM

The Australian Packaging Covenant is an agreement between companies in the supply chain and all levels of government to reduce the environmental impacts of consumer packaging. Signatories to the Australian Packaging Covenant are made up of industry, government and community groups who are part of the packaging supply chain. In October 2011 there were 672 Australian Packaging Covenant signatories.

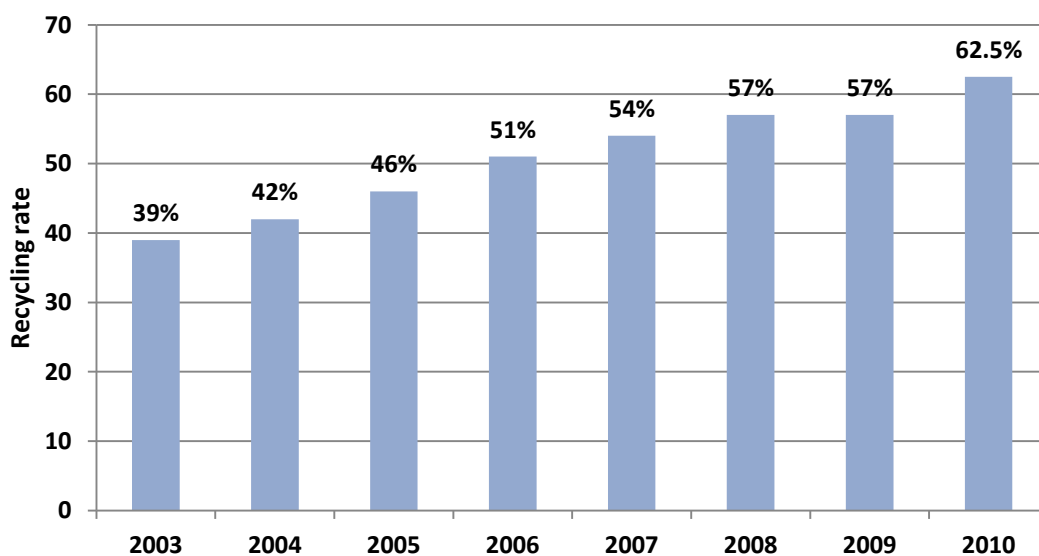
The Australian Packaging Covenant has operated since 1999 as the primary national mechanism for managing the environmental impacts of packaging in Australia. It is based on the principle of product

stewardship: all participants share responsibility for the environmental impacts associated with their sphere of activity.

The Australian Packaging Covenant is underpinned by the National Environment Protection (Used Packaging Materials) Measure (the NEPM). The Used Packaging Materials NEPM is made under the *National Environment Protection Council Act 1994* by the Commonwealth, state and territory environment ministers. The NEPM provides free-rider regulation to ensure companies who are signatories to the Australian Packaging Covenant are not disadvantaged for taking action to reduce environmental impacts. Brand owners with an annual turnover of greater than \$5 million are required to join the Australian Packaging Covenant or face compliance action under the NEPM.

The Australian Packaging Covenant reported an overall recycling rate of 62.5 per cent for post-consumer packaging in Australia in 2010, a 5.5 per cent increase on the previous year and a significant increase from the 2003 baseline of 39 per cent (APCC 2011, p. 12). Nevertheless, this was 2.5 per cent lower than the 2010 recycling target of 65 per cent. Figure 2 shows the packaging recycling rate from 2003 to 2010. The key drivers behind the increased recycling rate are improvements in paper and glass recycling, and investment in significant infrastructure projects by the Australian Packaging Covenant, industry and governments. These investments have been crucial during a period of global economic instability that has impacted on the Australian business environment.

FIGURE 2: PACKAGING RECYCLING RATES 2003 TO 2010



Source: APCC 2011, p. 12.

The current Australian Packaging Covenant, which commenced on 1 July 2010, places an increased emphasis on the sustainable design of packaging, recycling at work and in public places, and reducing packaging litter.

The objective of the Australian Packaging Covenant is to minimise the overall environmental impacts of packaging by pursuing the following performance goals:

1. Design: optimising packaging to use resources efficiently and reduce environmental impacts without compromising product quality and safety.
2. Recycling: efficiently collecting and recycling packaging.

3. Product Stewardship: demonstrating commitment by all signatories.

OTHER INDUSTRY INITIATIVES

The Australian Packaging Covenant is one of a suite of mechanisms that have contributed to the improvement in the recycling rate. It is difficult to directly attribute improvements in the recycling rate to any one action because these initiatives are wide ranging and delivered by a range of stakeholders including governments, industry, wholesalers, retailers, consumers and waste service providers.

The Packaging Stewardship Forum is an industry initiative which aims to deliver voluntary industry recycling, litter reduction and education programs on behalf of members. Members include large beverage companies and their packaging suppliers. The Packaging Stewardship Forum is focused on providing cost-effective resource recovery and litter reduction solutions that deliver measurable outcomes.

The National Packaging Covenant Industry Association is part of an industry commitment to the Australian Packaging Covenant, providing an incorporated legal entity to hold, disperse and report on industry and government funds used to administer the Australian Packaging Covenant (APC 2011, pp. 47-48).

2.7 QUESTIONS FOR CONSULTATION

Stakeholders are welcome to provide feedback on any aspect of this chapter. The following questions have been formulated to provide a starting point for submissions:

- What do you think are the future challenges for packaging and waste packaging?
- What packaging materials do you think will dominate in the future? What will the effect of this be?
- Do you think that designing packaging with recyclability in mind is desirable?
- What packaging innovations are likely and what might be their impacts?
- What changes will occur with secondary packaging?
- How will the trend for on line shopping affect packaging consumption or choice of packaging material?

3 NATURE AND EXTENT OF THE PROBLEM

Note: Material in this chapter draws on the independent report, *Problem Statement for Packaging*, which was prepared by PwC and Wright Corporate Strategy (WCS) and is included as Attachment A.

COAG's *Best Practice Regulation Guide* (2007) states that a RIS should:

- clearly identify the fundamental problem(s) that need to be addressed and present evidence of their magnitude (scale and scope)
- demonstrate that existing regulation is not adequately addressing the problem(s)
- identify relevant risks, including the risks of not introducing regulation, and
- present a clear case for additional government action.

This chapter outlines the nature of the policy problems that are being addressed in this Consultation RIS, and provides evidence of the scale and scope of these problems. There are a number of aspects of these problems that are uncertain, and stakeholder feedback is sought on these areas of uncertainty. Stakeholder feedback is also sought on any additional problems not considered here. Consultation questions have been identified at the end of the chapter to guide stakeholder submissions on this Consultation RIS.

3.1 WHAT PROBLEMS ARE BEING ADDRESSED?

The key problems being addressed through this Consultation RIS are that governments' stated objectives and community expectations for the recovery and recycling of packaging and management of litter are not being met. This includes consideration of non-use values for increasing packaging recycling and reducing litter, such as Australians' desires to live in a less wasteful society and minimise our impact on the environment.

As discussed in Chapter 2, packaging plays an important role within the modern economy, with most goods being packaged for distribution, transport and retail sale. The national packaging recycling rate has increased from 39 per cent in 2003 to 62.5 per cent in 2010. This improvement has largely been achieved through the extensive at-home kerbside recycling services provided by local governments and a strong increase in the recycling of paper and cardboard packaging, which in 2010 accounted for 73.3 per cent of the total weight of recycled packaging (calculated from APCC 2011, p. 21) and 60.6 per cent of packaging (by weight) in the C&I sector.

Measured litter rates have also been decreasing in recent years. The Keep Australia Beautiful National Litter Index shows that, at a national level, the average number of littered items in surveyed urban sites has decreased from 74 items per 1000m² in 2006-07 to 61 items per 1000m² in 2010-11. The average volume of litter in surveyed areas has decreased from 9.68 litres per 1000m² in 2006-07 to 6.49 litres per 1000m² in 2010-11 (McGregor Tan Research 2011, p. 17).

It is expected that the national packaging recycling rate will continue to improve and litter will continue to decrease under existing arrangements. This expectation is based on assumptions that the current extent of and capacity for recycling different packaging materials through kerbside collection will continue to improve and that paper and cardboard will continue to be consumed and recycled at an equivalent rate.

Nevertheless, these broad national performance metrics mask a number of specific problem areas and inefficiencies with current arrangements that could be addressed through a strengthened regulatory

approach to packaging. In addition, there is a tangible risk that recycling and litter performance will deteriorate in the absence of a strengthened regulatory approach.

The disaggregation of the national packaging recycling rate in terms of material and location reveals a great variation in performance, due to the impact which paper and cardboard packaging (which has high rates of both consumption and recycling) has on the overall figures and the disparity in recycling outcomes for materials which are discarded at home as opposed to away from home. In this context, away-from-home includes packaging waste from workplaces, industry, shopping centres, hospitality venues, institutions and public spaces. In addition, variation in recycling performance for different packaging materials is evident in the municipal waste sector due to the uneven provision of recycling services. Cost concerns, volume of material, available recycling infrastructure and contracting arrangements drive the provision of local government recycling services. Kerbside recovery rates for recyclable materials are higher than recycling rates, due in part to a lack of capacity to recycle particular materials within a local government area.

When paper and cardboard packaging consumption and recycling data are excluded from the overall packaging figures, 1.74 million tonnes of packaging was consumed, 0.65 million tonnes recycled and 1.05 million tonnes sent to landfill in 2010 (calculated from APCC 2011, p. 21). This represents a much lower national recycling rate of 37.2 per cent. In addition, the relative contribution of at-home and away-from-home locations in improving recycling rates changes significantly. With paper and cardboard packaging included, the national at-home recycling rate is 60 per cent and the away-from-home recycling rate is 64 per cent. Without paper and cardboard packaging recycling, the at-home recycling rate is 52.5 per cent and the away-from-home recycling rate is 25.3 per cent. This impact on away-from-home recycling rates largely reflects highly organised recycling arrangements for paper and cardboard in C&I settings and viable end markets for recyclates.

For the other major material types, away-from-home recycling rates are considerably lower than at-home recycling rates: for glass away-from-home the recycling rates are 26.6 per cent, compared with 53.8 per cent at-home; for plastic the rates are 23.1 per cent away-from-home compared with 51.7 per cent at-home; and for steel cans the away-from-home rate is 14.6 per cent while it is 37.0 per cent at-home. Current policy settings do not address the relatively low recycling rates for common packaging materials away-from-home because of the lack of effective recovery systems and the diffuse responsibility for managing that waste. These low rates result in loss of embedded resources, faster consumption of landfill space and increased litter which have associated environmental impacts.

In addition to the above problem of low away-from-home recycling rates for key packaging materials, there is also a tangible risk that national packaging recycling and litter performance will deteriorate in response to the trends outlined in Chapter 2. Packaging choices are driven by food and safety concerns, cost, convenience and marketability. Future trends that will affect the consumption, location and type of packaging include:

- an increase in away-from-home consumption of food and beverages (ABS 2007);
- a continuing increase in single serve and convenience packaging (Frost 2005);
- an increase in consumer demands for green packaging, less packaging and recyclability (Jarratt & Mahaffie 2010);
- an increase in business demand for lightweighting to decrease resource use and transport costs (Jarratt & Mahaffie 2010), and

- an increase in use of marketing opportunities related to digital printing which allows for use of hybrid packaging, shorter runs and greater customisation of products (Jarratt & Mahaffie 2010).

The combination of these forces does not guarantee that reduced use of resources, increased recyclability or reduced waste to landfill will result. The demands for lightweighting and increased marketing opportunities could lead to perverse environmental impacts such as introducing more complex packaging to replace simpler materials and the pursuit of lighter materials at the expense of recyclability. The lack of a sufficient market signal for manufacturers and specifiers of packaging to consider the environmental impacts associated with packaging could lead to an increased waste burden for local governments in particular. This would result in increased costs associated with landfill and greater exposure of landfill operators to the financial risks associated with fluctuating commodity prices.

There is also a tangible risk that continued improvements in the national packaging recycling rate will not materialise in the absence of a strengthened national approach to packaging. The current mechanism at a national level for addressing packaging waste and litter is the Australian Packaging Covenant which is a partnership between governments at all levels, non-government organisations and industry, underpinned by regulation. While a core assumption of the analysis in this Consultation RIS is that existing arrangements (the 'base case') will continue to deliver improvements in the national recycling rate, the base case also recognises that the targets set by the Australian Packaging Covenant in its 2010-2015 strategic plan (APCC 2010) will not be fully realised. This assumption is based on current outcomes and points to some inadequacies in the current partnership arrangement.

Some jurisdictions regard particular segments of packaging waste as a key environmental concern and have specific legislation in this area (such as CDL in South Australia and the Northern Territory). Other jurisdictions have legislation which could be utilised to introduce state-based product stewardship for packaging (e.g. New South Wales and Western Australia).

In the absence of a strengthened national regulatory approach to packaging, it is likely that other jurisdictions may unilaterally introduce inconsistent regulations, which would impose costs on Australia's economy and on businesses operating in a national market.

A likely outcome of the introduction of increased regulation of beverage containers through a CDS is that affected businesses will seek to reconsider their participation in the Australian Packaging Covenant. While outcomes are not certain, it is likely that action on a particular type of packaging waste, such as beverage containers, will have implications across all packaging waste actions.

An increasingly fragmented jurisdictional approach to packaging waste adds to the administrative costs of government and the compliance costs of business, and would appear contrary to the National Waste Policy and COAG reforms for a seamless national economy and a reduction in regulatory complexity.

The resulting regulatory complexity has the potential for inconsistent data collection, reporting requirements, compliance regimes and infrastructure provision which may create uncertainty and extra costs for brand owners and specifiers of packaging. Such fragmentation also leads to diseconomies in scale which in turn could affect the end markets for recyclates. This could further hinder efforts for resource recovery in other jurisdictions where waste packaging is not regulated.

Furthermore, there is a real risk that performance will deteriorate, particularly in rural and regional areas where the availability of recycling services is already irregular. An improvement or expansion of services in the municipal sector cannot be assumed.

3.2 SUMMARY

In summary, the key problem with the current state of packaging consumption and recycling in Australia is that Government objectives for reduced waste and increased resource recovery are not being met due to the low or suboptimal away-from-home recycling rates for glass, plastic, steel and aluminium in the commercial, hospitality and institutional sectors. This leads to a loss of resources, increased use of landfill and environmental externalities including litter.

Associated with this, there is potential for increasingly fragmented jurisdictional approaches which add to regulatory complexity, increase business costs and uncertainty for investment and fragment end-markets. Inconsistency and duplication hinder the efficient operation of businesses in a national market.

Continued improvements in recycling rates will also rely on local government who provide municipal services across all packaging. The current disparity in provision of services across urban and rural/regional settings illustrates that an expansion and improvement of these services cannot be assumed. Further discussion of the problems, and the regulatory and market failures that contribute to them, can be found in Attachment A.

3.3 QUESTIONS FOR CONSULTATION

Stakeholders are welcome to provide feedback on any aspect of this chapter. The following questions have been formulated to provide a starting point for submissions:

- Do you agree with the packaging resource recovery and litter management problems identified above?
- Are there any problems with packaging resource recovery and litter management that have not been identified in Chapter 3?
- What impacts do fragmented and inconsistent frameworks for packaging resource recovery and litter management have on your business? What are the scale and scope of these impacts?
- Would inconsistent state-based CDSs impose a cost on your business? How significant would this cost be?

4 OBJECTIVES OF GOVERNMENT ACTION

A Consultation RIS should clearly articulate the objectives of government action (COAG 2007, p. 10).

The National Waste Policy, which was agreed by EPHC in November 2009 and endorsed by COAG in October 2010, outlines a range of interrelated drivers for a national approach to waste avoidance, waste management and resource recovery. These include:

- large scale growth in the generation of waste and its increasing complexity
- the opportunity to manage waste as a resource and invest in future long term economic growth
- the potential for waste management to reduce greenhouse gas emissions, and improve energy and water efficiency
- changing community expectations and aspirations, and
- inefficiency in the regulation of resource recovery and waste management sectors due to a lack of co-ordination and consistency across Australian jurisdictions.

Given the above drivers and the significance of packaging within the waste and litter streams, Strategy 3 of the National Waste Policy focuses specifically on packaging, aiming to “...better manage packaging to improve the use of resources, reduce the environmental impact of packaging design, enhance away-from-home recycling and reduce litter” (EPHC 2009, p. 10).

Strategy 3 sits under the key direction of the National Waste Policy of ‘taking responsibility’ for reducing the environmental, health and safety footprint of manufactured goods and materials across the manufacture-supply-consumption chain and at end of life. The objective of this key direction is to support businesses and consumers to appropriately manage end-of-life products, materials and packaging.

Another key direction of the National Waste Policy is ‘improving the market’. The objective of this key direction is to support waste avoidance, reduction, recovery and re-use by addressing market impediments and removing red tape.

In line with these government commitments, the objectives of government action are to:

- reduce packaging waste and increase packaging resource recovery, particularly for glass, plastic, steel and aluminium in the commercial, hospitality and institutional sectors (away-from-home)
- reduce the need to landfill recyclable packaging materials, thereby freeing up landfill capacity for non-recyclable materials and avoiding landfill externalities
- reduce the negative amenity, health and environmental impacts of packaging waste and litter in line with community expectations, and
- promote a consistent national approach to regulating packaging, which minimises regulatory complexity, business costs and uncertainty for investment and ensures the efficient operation of businesses operating in a national market.

5 OPTIONS TO ADDRESS THE PROBLEMS

Note: Material in this chapter has been sourced from the independent *Packaging Options Report*, which was prepared by PwC and WCS and is included as Attachment B.

As part of the RIS process, it is necessary to describe and consider different options that can be implemented to achieve governments' stated objectives (see Chapter 4). COAG's *Best Practice Regulation Guide* requires that a RIS identify and test the effectiveness and appropriateness of the most feasible range of alternative options, including (as appropriate) non-regulatory, self-regulatory and co-regulatory options (2007, p. 10).

Below are the four options for achieving the stated objectives considered in the Consultation RIS. These options are not meant to be exhaustive and stakeholders are encouraged to propose alternate options that may be effective and feasible in addressing the problems set out in Chapter 3. Consultation questions on the proposed options are included at the end of this chapter.

- Option 1: National Waste Packaging Strategy (non-regulatory)
- Option 2: Co-regulatory Packaging Stewardship, with three specific sub-options:
 - 2 (a): the Australian Packaging Covenant replaced by co-regulation under the *Product Stewardship Act 2011* (the Act)
 - 2 (b): Industry Packaging Stewardship
 - 2 (c): Extended Packaging Stewardship
- Option 3: Mandatory Advance Disposal Fee (ADF)
- Option 4: Mandatory Container Deposit Scheme (CDS), with two specific sub-options:
 - 4 (a): Boomerang Alliance CDS
 - 4 (b): Hybrid CDS

5.1 BASE CASE

These four options (including sub-options) have been identified for analysis in the context of the current arrangements in place to deal with packaging and other recyclable materials. These arrangements include kerbside recycling in all states and territories, a CDS operating in South Australia and soon to be implemented in the Northern Territory, and the Australian Packaging Covenant arrangement which has been the nationally consistent approach to managing the environmental impacts of packaging since 1999. These activities constitute business as usual (or the 'base case'). The RIS options have been developed to address a range of key considerations: consistency with the National Waste Policy, providing national consistency and certainty to business, and meeting community expectations.

5.2 OPTION 1: NATIONAL PACKAGING WASTE STRATEGY

Option 1 addresses the problem of the potential for fragmented jurisdictional approaches to packaging. This option involves the development of a national packaging waste strategy to deal with all packaging materials, funded from additional government resources. It represents a non-regulatory option led by governments. The strategy would coordinate jurisdictional actions to increase recovery and recycling of packaging waste and reduce litter. Moreover, it would seek to improve the use of current infrastructure

through disseminating information and advice to consumers and sharing information across governments. Elements of a national packaging waste strategy may include:

- the development of a national litter methodology for measurement and monitoring of litter rates,
- national programs to increase away from home recycling at mass consumption areas,
- co-coordinated litter campaigns,
- consistent labelling of recycling bins, and
- development of voluntary standards for end products and pack labelling to highlight recyclability.

This option is funded by Commonwealth, state and territory governments and facilitated by a national body made up of representatives from Commonwealth, state, territory and local governments. The strategy covers packaging materials, however there may be associated benefits for non-packaging litter and recycling through national education campaigns under this option.

5.3 OPTION 2: CO-REGULATORY PACKAGING STEWARDSHIP

Option 2 is a co-regulatory packaging stewardship arrangement under the *Product Stewardship Act 2011* (the Act). The Act provides for voluntary, co-regulatory and mandatory product stewardship. This option falls under the co-regulatory provisions of the Act.

Three sub-options are proposed under option 2:

- (a) Australian Packaging Covenant replaced by co-regulation under the Act
- (b) Industry Packaging Stewardship, and
- (c) Extended Packaging Stewardship.

Under each of these sub-options, the current Australian Packaging Covenant and NEPM arrangement would transition under the co-regulatory provisions of the Act. This option would require the Commonwealth government to develop regulations under the Act specifying the liable parties and setting the minimum outcomes and operational requirements for approved co-regulatory arrangements (which liable parties are obliged to adhere to under the Act). The administrators of approved arrangements would have flexibility regarding how requirements and outcomes are achieved.

These sub-options deal with all packaging materials and represent increasing levels of industry action and funding. Due to the increase in industry commitment, each sub-option would focus on a greater number of problems and barriers. Sub-option 2 (a) targets strengthening the packaging compliance regime by transitioning the Australian Packaging Covenant and NEPM arrangement under the Act, providing for greater enforcement of outcomes. In addition to strengthening compliance, sub-option 2 (b) also targets away-from-home recovery and recycling through the provision of away-from-home recycling infrastructure and other initiatives. Sub-option 2 (c) seeks to address all the problems set out in Chapter 3, including limited away-from-home packaging recycling, fragmented jurisdictional approaches to waste packaging, and lack of capacity to recycle particular materials.

A co-regulatory arrangement under the Act would differ from the current Australian Packaging Covenant framework, including in relation to liable parties, enforceable targets and penalties. The Australian Packaging Covenant has a broader membership from along the packaging supply chain and including membership from all three levels of government and non-government organisations.

In terms of requirements set out under the Act and that would be provided for in regulations, the class of products, liable parties and indicative outcomes for each of the co-regulatory sub-options are identified in Table 5.

TABLE 5: PROPOSED 2020 OUTCOME TARGETS FOR OPTION 2

Option	Class of products	Liable parties	Outcomes by 2020
2 (a)	Consumer packaging (as defined in the NEPM)	Consumer packaging brand owners	Sustainable packaging design and production.
			Packaging recycling target: 515,729 tonnes per annum (set to achieve 75% packaging recycling).
			Litter reduction target.
2 (b)	Consumer packaging	Consumer packaging brand owners	As for 2 (a), with higher recycling and litter targets. Packaging recycling target: 386,162 tonnes per annum (608,914 tonnes including beverage containers).
	Beverage packaging	Beverage packaging brand owners	Beverage container recycling target: 222,752 tonnes per annum (set to achieve 70% beverage container recycling).
2 (c)	Consumer packaging	Consumer packaging brand owners	As for 2 (b), with higher recycling target. Packaging recycling target: 515,237 tonnes per annum (737,989 tonnes including beverage containers) (set to achieve 80% packaging recycling).
	Beverage packaging	Beverage packaging brand owners	As for 2 (b).

OPTION 2 (A): AUSTRALIAN PACKAGING COVENANT REPLACED BY CO-REGULATION UNDER THE PRODUCT STEWARDSHIP ACT

Under this sub-option the current Australian Packaging Covenant and NEPM framework would transition under the co-regulatory provisions of the Act. Under option 2 (a) it is assumed that overall outcomes would be consistent with those contained in the Australian Packaging Covenant Strategic Plan 2010-2015 (APCC 2010), whilst how they are achieved would necessarily be different and reflect requirements of the Act. This sub-option targets packaging material.

Under this sub-option, packaging brand owners⁵ are liable parties, obliged to be members of an approved co-regulatory arrangement. An approved co-regulatory arrangement would in turn be required to meet enforceable recycling targets and other outcomes. Because of the constitutional limitations of the Act, state, territory and local governments and non-government organisations would not be liable parties, and are not eligible to join an approved arrangement. The requirement in the Act that liable parties must be, or

⁵ Based on the NEPM definition of 'brand owner'.

have been, manufacturers, importers, distributors or users of the products in question (in this case consumer packaging) would also need to be considered in the definition of brand owner.

The target for this sub-option is based on projections from the outcomes committed to in the Australian Packaging Covenant Strategic Plan 2010-2015 (APCC 2010). The target in Table 5 above is set at the contribution (in tonnes) required from packaging industry brand owners to achieve an overall 75 per cent national recycling rate in 2020, recognising that non-industry parties also contribute to national recycling rates. Thus the target for option 2 (a) reflects the additional 2.5 per cent recycling rate which this option delivers above the base case projections and the proportion of the base case recycling effort attributable to industry's actions.

Option 2 (a) is funded by contributions made by packaging brand owners to administrators of co-regulatory arrangements.

OPTION 2 (B): INDUSTRY PACKAGING STEWARDSHIP

This sub-option builds on option 2 (a) and also includes an enhanced focus on away-from-home beverage container recycling and packaging litter reduction. It deals with all packaging materials, with targeted initiatives on beverage containers and glass market development.

It is based on the National Bin Network proposal brought forward by leading companies in the beverage manufacturing and packaging sector (Amcor Australasia, Coca-Cola Amatil, Lion, Schweppes Australia and Visy) to expand the existing Australian Packaging Covenant to focus on key problem areas (National Bin Network 2011). The focus of these additional initiatives is on away-from-home recycling through a national rollout of bins in public places and other initiatives to improve recovery and recycling of beverage containers, particularly of glass, polyethylene terephthalate (PET) plastics and aluminium, consumed away-from-home. In regard to reduced litter the focus is on impacts from all types of packaging and all material types including fast-food packaging, confectionary packaging, cigarette packaging and beverage packaging.

As per option 2 (a) above, option 2 (b) involves transitioning the current Australian Packaging Covenant and NEPM arrangements under the co-regulatory provisions of the Act. However, the regulations would specify higher outcome targets for the product class of beverage packaging, consistent with this part of the industry undertaking additional actions in specific problem areas related to away-from-home beverage container recycling and packaging litter. In addition, the litter reduction outcomes would be strengthened. The liable parties for the broader packaging outcomes would remain packaging brand owners, as with option 2 (a).

Option 2 (b) is funded by contributions made by packaging brand owners and by beverage sector brand owners for the higher outcomes for beverage packaging. Industry has estimated the cost of initiatives under the National Bin Network at \$20 million per annum (National Bin Network 2011, p. 32).

The beverage container recycling target in Table 5 above has been developed based on the industry's National Bin Network proposal. The target represents the additional tonnes of beverage packaging that would need to be recycled to achieve a 70 per cent beverage container recycling rate in 2020 from the current rate of recycling of beverage containers of 48.7 per cent.

OPTION 2 (C): EXTENDED PACKAGING STEWARDSHIP

This sub-option is also based on the Australian Packaging Covenant arrangement being transitioned under the Act. It deals with all packaging materials and would involve packaging brand owners. It differs from sub-options 2 (a) and 2 (b) in that it involves substantially increased industry action to achieve a significant improvement in packaging recycling and litter reduction.

The scheme focuses on improving the recycling performance of all packaging, with a focus on recycling and litter where there are identified problem areas such as lagging recycling rates. It has more ambitious recycling outcome targets for the broader packaging industry than sub-option 2 (b). It involves substantially increased industry action in packaging recovery and litter reduction.

As with sub-options 2 (a) and 2 (b) the arrangement would have flexibility as to how to achieve specified outcomes. The outcomes set in the regulations would focus on addressing a broad range of barriers to increased packaging recycling and litter reduction, determined on the basis of the analysis of key problem areas. It is likely that this option may involve additional support for local government kerbside collection and litter cleanup activities.

This option has been developed to build on the outcomes identified for option 2 (a) and 2 (b) and hence is implicitly based on target commitments identified in the Australian Packaging Covenant Strategic Plan 2010-2015 and the National Bin Network.

The additional packaging recycling target in Table 5 above represents the additional tonnes of packaging that would need to be recycled to achieve an 80 per cent national recycling rate in 2020, based on an assumption that the base case will achieve a national packaging recycling rate of 67.5 per cent by 2015.

5.4 OPTION 3: MANDATORY ADVANCE DISPOSAL FEE

This option would involve the government placing a mandatory ADF on all packaging materials. As this option may have broadly similar initiatives to those of sub-option 2 (c), it would address the same problems and barriers.

An ADF is intended to influence producer choices toward particular policy objectives. There are a number of ways that an ADF may reduce packaging waste being sent to landfill including:

- source reduction by packaging manufacturers and brand owners
- reduction in consumption of packaging, and
- increased recovery of used packaging.

An ADF also provides a source of revenue for the end-of-life management of packaging or for other environmental initiatives. The revenues collected would be used to fund recycling and litter reduction initiatives broadly similar to those covered in option 2 (c). It is also possible that initiatives under option 1 could be funded through an ADF, however, the outcomes would focus on broader packaging recycling outcomes than option 1.

The ADF would be designed as a weight based fee per tonne of packaging materials. The fee would vary depending on material type, the cost of recycling the material or the cost of end-of-life disposal of that material. This option would require new legislation to authorise the imposition and administration of the ADF.

5.5 OPTION 4: MANDATORY CONTAINER DEPOSIT SCHEME

This option involves establishing a mandatory CDS to deal with beverage container packaging waste. This would be a deposit-refund arrangement under the co-regulatory and/or mandatory provisions of the Act. Depending upon the design of the scheme, it may also require new legislation to authorise the imposition and administration of the container deposit. Under this option consideration could also be given to prohibiting the sale and import and manufacture of non-recyclable beverage containers.

Two sub-options are proposed under option 4: one has been proposed by the Boomerang Alliance and one is based on case studies of schemes operating internationally and from elements of the South Australian CDS. Funding for these sub-options is from the beverage industry and not the broader packaging industry. It is assumed that the Australian Packaging Covenant would continue under these sub-options.

Option 4 seeks to address all the problems set out in Chapter 3. Principally, this option targets away-from-home recovery and recycling, and litter reduction by introducing a deposit on all beverage containers. It has also been developed to address the problem of fragmented jurisdictional approaches to packaging by creating a national container deposit scheme. Whilst this option targets beverage containers, there may be co-benefits for non-beverage containers through the provision of additional infrastructure.

OPTION 4 (A): BOOMERANG ALLIANCE CDS

Option 4 (a) is a CDS proposed by the Boomerang Alliance. It would cover a broad range of beverage containers. Typically used in household and business settings, and for away-from-home personal consumption. Containers covered under the scheme are those up to and including 3 litres.

This option is based on a hub and spoke container redemption/collection model operated through a mandatory product stewardship scheme. It involves a \$0.10 per container deposit that can be redeemed by returning eligible containers to a diverse range of collection points (super-collectors/hubs, collection centres, reverse vending machines). Rural and remote areas would have glass crushers available at selected local shops.

A not-for-profit body would consolidate all deposits collected at point of sale and collect revenue gained from sale of redeemed recyclate. This body would appoint hub operators on a competitive basis, who would in turn be responsible for running the system in their local region.

Consideration of this sub-option also includes discussion of the merits and drawbacks of a possible extension to non-beverage packaging and some indicative estimates of possible redemption levels and benefits flowing from such an extension, including to the recycling sector.

This sub-option would require consideration of transitional issues in South Australia and the Northern Territory.

OPTION 4 (B): HYBRID CDS

Option 4 (b) is a national CDS model based on case studies of schemes operating internationally and elements of the existing South Australian scheme. It draws on analysis by Martin Stewardship and Management Strategies (MS2) of a potential Australian-specific CDS, particularly considering British Columbia's Encorp Pacific CDS. In addition, it has been tailored to Australian conditions and also reflects the existing approach in South Australia.

This option covers beverage containers and assumes a modern mix of collection infrastructure (store front depots and reverse vending machines), and a deposit of \$0.10 per beverage container increased in \$0.10 increments over time to keep pace with inflation.

Containers covered under the scheme are those up to and including 3 litres.

It is proposed as an industry-driven scheme, in which industry would establish a Product Stewardship Organisation (PSO) to operate the scheme and meet specified performance targets. Liable parties would be manufacturers and importers of such beverages.

The primary redemption point for the deposit in this option is assumed to be dedicated collection depots complemented by reverse vending machines. The PSO would be required to establish collection centres geographically to ensure coverage and consumer convenience, in order to achieve the recycling and litter targets. The depots could be operated by independent owners/operators contracted by the PSO. This would mean that many items would be sorted by the reverse vending machines (avoiding some hand sorting). Additionally, the store-fronts could sort items and crush them prior to transportation.

This sub-option would require consideration of transitional issues in South Australia and the Northern Territory.

5.6 IMPLEMENTATION

The table below summarises the assumed years for implementing each of the options. All options are assumed to commence in the financial year following the completion of their development.

TABLE 6: OPTION DEVELOPMENT AND COMMENCEMENT TIMING ASSUMPTIONS

Option	Option development	Commencement year	Note
Option 1	2011-12 to 2012-13	2013-14	<ul style="list-style-type: none">• One year to develop the Decision RIS (2011-12).• One year to develop a national packaging waste strategy (2012-13). The strategy could coordinate jurisdictional action that increases the recovery of packaging waste and reduces litter with minimal additional resources and/or funding. This option seeks to improve the use of current infrastructure through increased knowledge, education and information sharing and therefore is a low cost, non-regulatory option.

Option	Option development	Commencement year	Note
Option 2 (a)	2011-12 to 2013-14	2014-15	<ul style="list-style-type: none"> • One year to develop the Decision RIS (2011-12). • Two years to develop the scheme regulations, establish the approved arrangements and receive Australian Competition and Consumer Commission (ACCC) authorisation (2012-13 to 2013-14).
Option 2 (b)			
Option 2 (c)			
Option 3			
Option 4 (a)	2011-12 to 2014-15	2015-16	<ul style="list-style-type: none"> • One year to develop the Decision RIS (2011-12). • Two years to develop the scheme regulations, establish the PSO and receive ACCC authorisation (2012-13 to 2013-14). • One year to implement the additional infrastructure (2014-15).
Option 4 (b)			

Source: See Attachment A, p. 2.

There are a number of factors which may have an impact on implementation timelines for the various options.

The Act is already in existence, which may accelerate the development of the scheme regulations for Options 2 (a) to 2 (c) relative to past experience in similar schemes. However, under the regulated options there is a possibility that new levy legislation may need to be developed in addition to scheme regulations being developed, depending on the model chosen.

In addition, there will be a need to consider international considerations, such as obligations under the World Trade Organisation, and competition considerations in both the framing and implementation arrangements for particular options.

There are a range of constraints that apply to the options presented in this chapter. For example, constitutional constraints need to be considered under all regulatory options. Other considerations are discussed further in Chapter 6, such as the likelihood of the options achieving the stated results and the possibility of the emergence of perverse environmental outcomes. It is noted that implementation of these options is proposed within the context of existing arrangements and they will therefore need to complement and not undermine these existing arrangements.

5.7 REVIEW

To proceed with one of the options assessed there are a number of review issues to consider.

- Governance arrangements to provide for regular review of the scheme at five-year intervals. The reviews should be independent and should include an assessment of:
 - actual recycling levels against targets
 - mechanisms for minimising fees and costs, such as the use of regular tendering or service contracts for collection or recycling services, and
 - any perverse impacts of the product stewardship arrangements, such use of non-recyclable materials that do not meet the legal definition of ‘packaging’ in order to avoid a levy.
- The level of involvement that government will have in the operation and ongoing monitoring of the scheme.

5.8 QUESTIONS FOR CONSULTATION

Stakeholders are welcome to provide feedback on any aspect of this chapter. The following questions have been formulated to provide a starting point for submissions:

- Are there any other options that you think would be effective in addressing the problems set out in Chapter 3?
- Will these options achieve the outcomes outlined in this chapter?
- If initiatives in Option 2 (c) and Option 3 are broadly the same, who would be more effective and/or efficient in overseeing these initiatives to achieve targets: non-government organisations, government or industry?
- The funds created by the ADF (Option 3) would be collected and managed by the Commonwealth government. On what initiatives should the Commonwealth government invest this funding?
- At what point in the packaging supply chain should the ADF be imposed to achieve the best outcomes?
- Under Option 4, should beverage containers be required to be recyclable as part of CDS proposals?
- Are the timeframes for implementation and review of the product stewardship arrangements appropriate?

Note: Material in this chapter has been sourced from the independent report, *Packaging Cost Benefit Analysis Report*, which was prepared by PwC and WCS and is included as Attachment C.

The purpose of impact analysis in a Consultation RIS is to present indicative information for public consultation relating to:

- the estimated net economic impacts of the regulatory and non-regulatory options being considered by governments
- the impacts on different groups within the community that are likely to be affected by the options (such as households, businesses and local governments)
- the risks associated with each option, and
- any effects they may have on competition.

In a RIS, options are assessed against a base case, or status quo, which is typically represented as no further intervention (i.e. the situation that would prevail if governments chose not to act to address the stated problems). In this case, the base case includes current arrangements in place across Australia to deal with packaging as well as other recyclable materials. As noted in Chapter 5 above, these include jurisdictional arrangements for municipal and C&I recycling, CDSs operating in South Australia and soon to be implemented in the Northern Territory, the Australian Packaging Covenant arrangement, and other voluntary industry actions.

This chapter provides an analysis of the effectiveness and efficiency of each option in achieving public policy objectives. In line with COAG requirements, the focus of the analysis is on the incremental impacts that the options will have, relative to the base case. The results are generally expressed in present values, meaning costs and benefits across the 24-year assessment period (2012 to 2035) have been converted to 2011 dollars using the standard discount rate of 7 per cent. Sensitivity testing has also been undertaken to test the impacts of changing key assumptions and inputs to the analysis.

- Section 6.1 outlines the projected performance of the options in relation to levels of packaging recycling and litter reduction.
- Section 6.2 presents the headline results of the CBA, including a discussion of core assumptions regarding costs and benefits.
- Section 6.3 provides individual analyses of each of the four options and discusses their distributional impacts.
- Sections 6.4 and 6.5 highlight some of the identified risks and expected competition effects of the options.

It should be noted that the CBA results are based on data from governments, industry and community groups and the professional judgements of PwC and WCS. There are limits to the available data and difficulties involved in estimating impacts on behavioural patterns of people under the various options. Given this relative uncertainty, the analysis in this chapter is not intended to be definitive. Stakeholder feedback is sought on all of the key assumptions that underlie the analysis. Consultation questions are included in Section 6.6 to guide stakeholder submissions.

6.1 PROJECTED PERFORMANCE OF OPTIONS

In order to undertake a CBA on the options identified in Chapter 5, it was necessary to estimate the projected packaging recycling and litter reduction performance for the base case and each option. As described in detail in Attachment C, these projections were developed by WCS based on past recycling and litter trends and their professional assessment of the likely impacts of the initiatives identified for each option.

PROJECTED CONSUMPTION

The packaging consumption projections are the same for all options and are based on population projections and historical packaging consumption growth rates. Between 2003 and 2010 packaging consumption in Australia increased at 51 per cent of the rate of population growth. For this analysis the ratio of packaging consumption growth to population growth is assumed to be 51 per cent from 2011 to 2015, 50 per cent from 2016 to 2020 and 49 per cent from 2021 to 2035. The ratio decreases marginally over time due to increased lightweighting of packaging. Some of the options may impact on consumption of packaging. In particular, option 4 will likely increase the price of beverages nationally and may have an impact on sales, which could in turn reduce packaging consumption. Equally, option 3 places a levy on packaging which may reduce consumption. These impacts, and possible impacts for other options, have not been factored into the analysis, but are identified as questions for consultation.

PROJECTED RECYCLING PERFORMANCE

Recycling projections were developed by WCS for each option by consumption location (at-home versus away-from-home) and for each product type (beverage containers, non-beverage containers) based on:

- the initiatives identified in Chapter 5 and in Attachment B (including the time period over which each initiative was assumed to operate)
- packaging industry plans and targets
- experience in other jurisdictions, and
- assumptions about the maximum achievable recycling rate by product or material.

The projected packaging recycling rates for each of the options are outlined in Table 13 of Attachment C, including a breakdown of the estimates of the non-beverage, beverage and flexible packaging recycling rates. The projected rates for the base case reflect the estimated packaging recycling performance of existing arrangements. The projected recycling rates for the options reflect the incremental difference they will make on top of the base case. Consequently, the options should not be interpreted as being responsible for the entire packaging recycling rate.

PROJECTED LITTER PERFORMANCE

Due to the lack of data on actual litter quantities at a national level, litter projections were developed based on an estimate of the proportion of packaging that could be available to be littered (that is, packaging that is currently not recycled and is consumed in an away-from-home setting). This was estimated to be around 1 million tonnes in 2010. Total litter per annum was estimated to be between 40,000 to 160,000 tonnes, which is between 4 per cent and 16 per cent of total packaging that is available to be littered (details of how this range was calculated is on pp. 14-16 of Attachment A). The core

assumption for the base case is that litter volumes would represent 6 per cent of packaging available to be littered, representing around 60,000 tonnes in 2010, which was assessed by WCS to be the most reasonable estimate within the above range. Litter projections are presented on a per tonne basis to ensure consistency with collection and recycling projections.

The litter projections were developed based on the estimated performance of initiatives directly targeting litter and, in the case of options 2 (b), 2 (c) and 3, initiatives indirectly targeting litter through the provision of away-from-home packaging recycling. The projected litter reduction rates for each of the options are outlined in Table 23 of Attachment C, including estimates of non-beverage, beverage and flexible packaging litter reduction. The projected rates for the base case reflect the estimated litter reductions from existing arrangements. The projected reductions for the options reflect the incremental difference they will make on top of the base case. Consequently, the options should not be interpreted as being responsible for the entire litter reduction rate.

6.2 COST BENEFIT ANALYSIS

A CBA provides important information for assessing the impacts of options. PwC undertook the CBA for this Consultation RIS based on general assumptions that are in line with the Australian Government's *Best Practice Regulation Handbook* (AG 2010, pp.62-63, 66). These assumptions apply across all of the options:

- **Incremental basis**
All option costs and benefits are measured incrementally relative to the base case.
- **Base year of the appraisal: 2011**
All monetised values are expressed in 2011 dollars unless otherwise stated.
- **Evaluation period: 24 years, from 2012 to 2035**
The total period of evaluation needs to be long enough to capture all potential costs and benefits of the proposal. As outlined in Chapter 5, option 1 is assumed commences in 2014, options 2 and 3 in 2015 and option 4 in 2016. This evaluation period allows for all options to have had 20 years of operation.
- **Real discount rate: 7 per cent**
All future cost and benefit cash flows are discounted to 2011 dollars using a real discount rate of 7 per cent. The impacts of alternative discount rates are assessed through sensitivity tests.

Table 7 below provides a summary of the key results of the CBA, based on market-based values and non-market values that could be monetised (i.e. landfill externalities). The table presents the estimated present value costs and benefits, net present value (NPV) and benefit-cost ratio (BCR) for each of the options. Further detail on the CBA can be found in Attachment C.

Net present value (NPV) and benefit cost ratio (BCR)

NPVs are calculated by subtracting estimated costs over the evaluation period from benefits. BCRs are calculated by dividing benefits by costs. A positive NPV indicates that an option would result in a net benefit to the Australian economy, whereas a negative NPV suggests that an option would impose a net cost.

Similarly, a BCR greater than 1 indicates an option has higher benefits than costs, while a BCR less than 1 indicates the costs are higher than the benefits.

It should be noted that these results do not take account of all of the non-market values that lead consumers to value packaging recycling and reduced litter, such environmental benefits or a feeling of civic duty. In addition, there is some unevenness in the likely precision of the cost and benefit estimates across the options. This is due to the nature of the options, the extent of previous work carried out and the ability to utilise data from existing schemes. Stakeholder feedback on the assumed performance, costs and benefits for each option is encouraged.

TABLE 7: CBA RESULTS BASED ON MARKET-BASED VALUES (AND LANDFILL EXTERNALITIES)

	Options						
	1	2 (a)	2 (b)	2 (c)	3	4 (a)	4 (b)
Costs (millions)	\$247	\$251	\$553	\$1,107	\$1,104	\$2,066	\$2,439
Benefits (millions)	\$249	\$293	\$528	\$957	\$957	\$708	\$708
NPV (millions)	\$2	\$43	-\$24	-\$150	-\$147	-\$1,358	-\$1,731
BCR (number)	1.01	1.17	0.96	0.86	0.87	0.34	0.29
2035 recycling (tonnes)	4,222,000	4,200,000	4,264,000	4,591,000	4,591,000	4,313,000	4,313,000
2035 litter (tonnes)	30,000	31,000	29,000	25,000	25,000	28,000	28,000
2035 landfill (tonnes)	956,000	977,000	915,000	811,000	811,000	867,000	867,000

KEY RESULTS OF THE CBA

Below is a summary of key results of the CBA based on market-based values and landfill externalities:

- Options 1 and 2 (a) are relatively low-cost options and both have positive NPVs without taking account of all non-market benefits. These options are expected to provide a net benefit to the economy, with NPVs of \$2 million for option 1 and 43 million for option 2 (a), and have the highest BCRs (for every \$1 of costs there are \$1.01 and \$1.17 of benefits respectively).
- All other options were assessed in the CBA as having negative NPVs and BCRs lower than 1. This suggests that for these options, the costs are greater than the benefits. As noted above, this result is reached by using the market value of resources recovered as the key benefit, and does not include non-market benefits that could not be quantified.
- Options 2 (b), 2 (c) and 3 involve higher costs and benefits than options 1 and 2 (a) and result in small net costs to the economy, with NPVs of -\$24 million for option 2 (b), -\$150 million for option 2 (c) and -\$147 million for option 3. The BCRs for these options are lower than 1.
- Options 4 (a) and 4 (b) are the highest cost options and have the lowest BCRs of all the options. This is driven by higher scheme initiatives and infrastructure costs relative to other options. However, these options also have the highest benefits, due to savings to the kerbside recycling system and the price premium that was applied to materials collected through a CDS.
- All options involve an overall increase in recycling by 2035, with options 2 (c) and 3 having the highest overall recycling rate in 2035 (86.4 per cent) and Options 4 (a) and 4 (b) having the highest beverage container recycling rates (reaching 85 per cent by 2025).

NON-MARKET BENEFITS

The benefits of each option are measured in the CBA using the market values of resources recovered and the avoided direct costs of landfill as the key benefits of increased packaging recycling and the avoided costs of litter clean up as the key benefit for packaging litter reduction. The non-market values of avoided landfill externalities were also quantified. However, households place values on increasing packaging recycling and reducing litter that include a range of other non-market components. These non-market benefits that lead consumers to value recycling and litter reduction could include the broader environmental or amenity benefits or a feeling of civic duty.

In 2010 PwC was commissioned by the EPHC to undertake a study of households' willingness to pay for increased packaging recycling and reduced litter, in order to attempt to quantify these non-market values. In the study it was found that households were willing to pay on average \$2.77 per year for every 1 per cent increase above current national levels of packaging recycling with lower and upper 95 per cent confidence interval of \$2.19 and \$3.77 (PwC 2010, p. iii). If the core values are applied to the incremental improvements in recycling for each option over the base case, the present value benefits in Table 8 can be calculated.

TABLE 8: SUMMARY OF WILLINGNESS TO PAY BENEFITS (INCREMENTAL TO BASE CASE, \$MILLIONS, PV)

Willingness to pay for:	Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
Increased recycling							
Lower	\$234	\$233	\$422	\$689	\$689	\$465	\$465
Point	\$296	\$295	\$534	\$872	\$872	\$588	\$588
Upper	\$403	\$402	\$727	\$1,186	\$1,186	\$801	\$801

The analysis above indicates that the present values of the willingness to pay benefits range from \$234 million for the lower bound estimate for option 1 to \$1.2 billion for the upper bound estimate for options 2 (c) and 3.

The 2010 study also conducted an analysis of the extent to which households value decreases in litter. The study showed that households were willing to pay up to \$226 million and \$451 million per annum for a 'noticeable improvement' in litter, and \$347 million and \$695 million for a 'significant improvement' in litter (at the lower and upper 95 per cent confidence intervals) (PwC 2010, p. iv). However, due to the survey design it has not been possible to apply these results to the individual options in the CBA as the willingness to pay for 'noticeable' and 'significant' improvements are not calibrated against actual tonnes of litter expected to be reduced. Further market research undertaken during the Consultation RIS development process to calibrate the willingness to pay values with existing litter measurements indicated that people consider a range of attributes when evaluating litter impacts and measures of reduction. This includes the type of material littered, the location of the litter and the proximity of the litter to litter-bin infrastructure, among other attributes. These findings indicate that calibrating the willingness to pay for litter reduction values to a single metric, such as number of items, volume or weight, is not possible. The values quoted above for a 'significant' and 'noticeable' improvement in litter can only be used as a qualitative measure to indicate that litter reduction is an important outcome for many people.

The Consultation RIS presents these willingness to pay figures alongside the CBA results to allow for these non-market aspects to be taken into consideration in assessing the overall costs and benefits of the options. It is not appropriate to add the CBA results and the willingness to pay results together because

there is likely an element of double counting (as survey participants may have considered market values associated with packaging when estimating their willingness to pay). Equally, it is not possible to disaggregate these willingness to pay values into market and non-market components, so the exact amount of this potential double counting is not able to be determined.

What the willingness to pay results show is that the community places a value on increased recycling and decreased litter. Judgments are required as to the extent to which these values offset net costs estimated in Table 8 above. Stakeholder feedback through the consultation process will be an important factor in guiding decision makers in these judgements.

COSTS

Governments, households, businesses and the packaging industry are assumed to incur certain incremental costs associated with the options. These costs were included in calculating the CBA and are listed below. A comparison of the incremental costs for each of the options is provided in Table 9. Further detail on how these costs were calculated for each option can be found in Attachment C.

Many of the costs that were quantified in the CBA are based on assumptions. Some of these assumptions are more certain, as they are based on existing data, while others have a greater degree of uncertainty around them. The assumptions around household and business participation costs are perhaps the least certain, and these costs have considerable weight in the analysis, so stakeholder feedback is sought on the reasonableness of these assumptions in particular (outlined in Attachment C, pp. 42-55).

Scheme design and implementation:

- Government-incurred costs to design and implement the regulation and make regulatory amendments.
- Government and/or industry costs for communicating the operation of the scheme to households and businesses.

Household participation costs:

- Costs incurred by households in participating in the scheme, which are assumed to include:
 - The value of the time it takes to sort additional packaging for recycling and transfer it to an accumulation point (such as a household recycling bin or public place bin).
 - For option 4, the costs of driving to a collection facility (including both vehicle operating costs and in-vehicle travel time) and the value of the time it takes to redeem containers at the facility.

Business participation costs:

- The value of the time it takes workers to sort additional packaging for recycling and transfer it to an accumulation point (i.e. a workplace recycling bin).

Collection, transport and recycling:

- The costs to transport packaging from collection infrastructure to a material recovery facility (MRF).
- Costs to sort/process packaging material delivered to a MRF and the cost to landfill residual material that is rejected due to contamination.

Scheme operation and compliance:

- Government costs to administer the regulation on an ongoing basis, which includes costs related to compliance and enforcement.
- Costs incurred by industry to report against targets and update labels in the CDS.
- Costs of establishing industry-run organisations (for options 2 and 4) or a government body (for option 3) responsible for the operation of the scheme.
- Infrastructure and operating costs for each of the scheme initiatives.

TABLE 9: INCREMENTAL COSTS, ANNUAL AND PRESENT VALUES OVER THE ANALYSIS PERIOD (\$ MILLIONS)

	Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
Scheme design and implementation	\$4	\$3	\$6	\$6	\$6	\$11	\$11
Scheme operation and compliance	\$87	\$16	\$183	\$348	\$345	\$4,391	\$4,728
Collection, transport, process at MRFs	\$89	\$158	\$218	\$438	\$438	-\$2,768	-\$2,768
Household participation costs	\$54	\$59	\$117	\$254	\$254	\$426	\$462
Business participation costs	\$13	\$14	\$28	\$61	\$61	\$6	\$6
TOTAL COSTS	\$247	\$250	\$553	\$1,107	\$1,104	\$2,066	\$2,439

BENEFITS

The following incremental market benefits for each option were included in the CBA:

- Market value of resources: The financial market value of recovered resources that are diverted from landfill or the litter stream, including premiums for segregated and cleaner material streams.
- Avoided regulatory costs: Avoided duplication of regulatory design, implementation and administration costs by jurisdictions.
- Avoided operating costs of landfill: The avoided direct costs associated with operating landfills due to diverting packaging from landfill, including the opportunity cost of land, and other ongoing costs.
- Avoided costs of litter clean up: The avoided direct costs to the government for the range of services they provide that contribute to litter prevention including municipal litter services, street sweeping and litter clean up services.

The following incremental non-market benefit was included in the CBA:

- Avoided landfill externalities: The estimated cost of landfill externalities such as greenhouse gas emissions and disamenity which are not incurred when packaging is recycled.

A number of potential benefits were not able to be included in the CBA calculations and are discussed qualitatively in Attachment C.

Key amongst these are society's willingness to pay for increased recycling and litter. As noted in the discussion of non-market benefits above, households place a value on recovering resources, for example, because they want to live in a less wasteful society or preserve resources or the environment for future generations. Likewise, households place a value on litter avoidance due to its negative impacts on society. The value that households place on litter can be considered a non-market value and includes visual amenity, danger to human health due to injuries from broken glass, the opportunity cost of litter clean up and danger to wildlife.

The willingness to pay values in Table 8 above reflect the values for increased recycling.

Potential co-benefits that are not included in the CBA and are discussed qualitatively include avoided resource costs and avoided costs of contaminated mixed waste. This latter avoided costs of removing packaging contaminants from mixed waste processed in alternative waste technology (AWT) facilities was not included in the core CBA due to uncertainty regarding the future uptake of AWTs.

TABLE 10: INCREMENTAL BENEFITS, ANNUAL AND PRESENT VALUES OVER THE ANALYSIS PERIOD (\$ MILLIONS)

	Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
Market value of resources	\$140	\$146	\$291	\$554	\$554	\$462	\$462
Avoided regulatory cost	\$0	\$35	\$35	\$35	\$35	\$35	\$35
Avoided landfill externalities	\$31	\$30	\$36	\$48	\$48	\$36	\$36
Avoided landfill operating costs	\$28	\$29	\$59	\$114	\$114	\$62	\$62
Litter clean up	\$51	\$53	\$107	\$207	\$207	\$113	\$113
TOTAL BENEFITS	\$250	\$293	\$528	\$958	\$958	\$708	\$708

CO-BENEFITS FOR RECYCLING OF OTHER MATERIALS

In addition to the co-benefits listed above, each of the options analysed could have a range of benefits for recycling of non-packaging items. Such co-benefits have not been quantified and included for analysis in the CBA, as these are indirect benefits and there is a high degree of uncertainty regarding their quantification across the various options.

All of the options include initiatives that provide scope for increasing the recovery of non-packaging materials. For example, promotion of recycling in away from home settings, such as workplaces and public places, in options 1, 2 and 3, could increase the awareness of the importance of recycling and lead to greater recycling of other goods. Similarly, options 2 and 3 include initiatives to increase recycling in remote areas where there is limited or no kerbside recycling. It is likely that such initiatives would increase recycling of both packaging and non-packaging materials.

Further, litter initiatives under options 1, 2 and 3, such as anti-litter education campaigns, installation of litter-bin infrastructure and enforcement initiatives, would most likely result in the reduction of all types of litter, not just packaging litter. Stakeholder feedback is sought on the quantification of potential co-benefits for these options.

With regard to options 4 (a) and (b), CDS collection facilities could also be used to recover other recyclable materials. Available evidence from the South Australian CDS indicates that its depots collect a substantial amount of non-beverage container materials, including packaging and non-packaging materials (such as steel cans, electronic waste, mixed glass, paper, cardboard, plastic and scrap metal). These depots are helped by the refund on beverage containers, as it gives households an incentive to visit the collection depots and therefore drop off other materials.

However, there is no certainty that introducing CDS into other jurisdictions would result in similar increases in collection of additional non-CDS materials. Other jurisdictions may already have collection channels for these materials, such as existing recycling depots that may already be collecting some or all of these

materials without CDS. Therefore it is difficult to estimate how much additional non-CDS material would be collected nationally under option 4.

To the extent that options 4 (a) and 4 (b) rely on RVMs and smaller ‘shop-front’ collection centres to a far greater degree than the South Australian CDS, it is uncertain whether there would be the same level of collection of non-beverage container packaging and non-packaging materials as reported from South Australia.

Furthermore, these benefits would not come without costs. For example, scaling collection systems up to receive additional non-packaging materials would result in additional storage and handling costs, among other costs. These costs would need to be allocated to the co-benefits.

Stakeholder feedback on this issue is encouraged, particularly if stakeholders have any data sources that could assist with quantifying these co-benefits.

SENSITIVITY ANALYSIS

In order to test the sensitivity of the CBA results to changes to costs, benefits and discount rates, a range of sensitivity tests were undertaken.

TABLE 11: SUMMARY OF GENERAL SENSITIVITY TESTING BASED ON MARKET VALUES, NPV (\$ MILLIONS)

	Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
Discount rate: 7% (core)	2	43	-24	-150	-147	-1,358	-1,731
Discount rate:1.85% (Garnaut)	5	56	-48	-298	-292	-2,837	-3,558
Discount rate: 3%	4	53	-40	-253	-248	-2,385	-3,001
Discount rate: 10%	1	36	-19	-107	-105	-925	-1,192
Costs + 30%	-72	-32	-190	-482	-478	-1,978	-2,463
Costs - 30%	76	118	141	182	184	-738	-999
Benefits + 30%	77	131	134	137	140	-1,146	-1,519
Benefits - 30%	-72	-45	-183	-437	-434	-1,571	-1,944
Costs + 30%; Benefits - 30%	-146	-120	-349	-769	-765	-2,191	-2,676
Costs - 30%; Benefits + 30%	151	206	300	469	471	-526	-787

The results of the sensitivity test can be summarised as follows:

- The costs and benefits are not sensitive to changes to the discount rates. All options remain negative when the discount rate is adjusted and when the costs are increased or benefits decreased. Options 4 (a) and 4 (b) were the most sensitive to changes in discount rates, as a higher proportion of their benefits are realised within the first 10 years of operation.
- Results are very sensitive to changes to the cost estimates. If costs decrease by 30 per cent, all options except options 4 (a) and 4 (b) become viable without factoring in the unquantified non-market benefits. If costs are increased by 30 per cent, all options have negative NPVs.
- Results are also sensitive to changes to benefits. If benefits are increased by 30 per cent, all options except options 4 (a) and 4 (b) become viable without factoring in the unquantified non-market benefits. If benefits are decreased by 30 per cent, all options have negative NPVs.

- Options 4 (a) and 4 (b) are not estimated to be viable under any sensitivity test. However, these results do not include non-market benefits that could not be quantified.

A number of additional sensitivity tests, which test the impacts of varying components of the CBA, have been included in Attachment C (pp. 97-106).

6.3 ANALYSIS OF INDIVIDUAL OPTIONS

This section individually presents the impact analysis for each of the four options. All values in this section are expressed in present values (PV) calculated over the 24-year evaluation period (2012 to 2035).

OPTION 1: NATIONAL PACKAGING WASTE STRATEGY

Option 1 is a low cost initiative that is estimated to deliver modest improvements to packaging recycling and litter management, which tail off from around 2025 as it approaches 80 per cent packaging recycling and 15 per cent litter reduction. As Table 12 below shows, based on market values alone, the NPV for this option over the analysis period is \$2 million, which suggests that it would result in a small net benefit for the economy. The scale of the willingness to pay estimates for recycling, which range from \$234 million to \$403 million (at the lower and upper confidence intervals), suggests that this option could generate a higher net benefit.

Table 13 below outlines the projected increases in recycling and reductions in litter under option 1. This option is projected to deliver an increase in recycling to 81.1 per cent, which is only slightly higher than the projected base case increase to 79 per cent. The reduction in litter is projected to be around 5 per cent greater under option 1 than the base case during most of the projection period. As this option targets all packaging items, this projected performance is spread across all product types (beverage containers and non-beverage containers).

TABLE 12: SUMMARY OF CBA RESULTS FOR OPTION 1
CBA (based on market values)

Cost (PV, millions)	\$247
Scheme design and implementation	\$4
Scheme operation and compliance	\$87
Collection, transport and recycling	\$89
Household participation	\$54
Business participation	\$13
Benefits (PV, millions)	\$219
Market value of resources recovered	\$140
Avoided costs of landfill	\$28
Avoided costs of litter clean up	\$51
NPV (millions)	\$2.5
BCR	1.01

Willingness to pay estimates

Packaging recycling (PV, millions)			Litter
Lower	Point	Upper	
\$234	\$296	\$403	N/A

TABLE 13: SUMMARY OF RECYCLING AND LITTER PROJECTIONS FOR OPTION 1

Recycling projections (% packaging recycled)

	2010	2015	2020	2025	2030	2035
Base case	62.5	67.5	72.5	77.1	79.0	79.0
Option 1	62.5	68.8	74.0	79.0	81.1	81.1

Litter projections (% reduction by weight)

	2010	2015	2020	2025	2030	2035
Base case	0.0	5.0	5.0	10.0	10.0	10.0
Option 1	0.0	5.0	10.0	15.0	15.0	15.0

As a non-regulatory option, the direct program costs of option 1 would be borne by the Commonwealth, state and territory governments amounting to around \$90 million. As it is anticipated that this option would result in greater increases in recycling and reductions in litter than the base case, households and businesses would incur participation costs in sorting recyclable materials and transferring them to recycling bins estimated to be around \$67 million. There would also be costs (estimated at around \$89 million) for local governments and commercial businesses to collect, transport and recycle the additional materials flowing through the municipal and C&I waste streams. However, these collection, transport and recycling costs would be offset by the value of the recovered resources (\$140 million) and avoided litter clean up (\$51 million) and landfill costs (\$28 million).

Arguably, implementing this option would be a low risk for governments. Even in the sensitivity test where benefits are reduced by 30 per cent and costs increased by 30 per cent the NPV for this option (-\$146 million) would still be offset by the lower bound of the willingness to pay estimates for increased recycling (\$234 million).

OPTION 2: CO-REGULATORY PACKAGING STEWARDSHIP

Option 2 involves three co-regulatory sub-options under the *Product Stewardship Act 2011*, each of which represents increasing industry commitment to packaging stewardship. As Table 14 demonstrates, the estimated NPVs for the three sub-options are: \$43 million for option 2 (a), -\$24 million for option 2 (b), and -\$150 million for option 2 (c). While both option 2 (b) and 2 (c) have a net cost, the BCR for 2 (b) is higher, at 0.96, as this sub-option involves higher costs and higher benefits.

Table 15 illustrate the difference in performance between the three sub-options. Option 2 (a) achieves higher national packaging recycling rates than the base case, as it involves setting regulated recycling outcome targets. Option 2 (b) has slightly higher projected packaging recycling performance, reflecting its additional beverage packaging recycling obligations. Option 2 (c) achieves considerably higher estimated packaging recycling rates, reaching 80 per cent in 2020, due to its higher regulated outcome target. The projected litter reductions for the sub-options are broadly similar. Option 2 (a) achieves a higher level of litter reduction than the base case, as it involves setting a regulatory target under the Act. The litter reduction estimates for options 2 (b) and 2 (c) are the same and are marginally higher than for option 2 (a), as these sub-options involve a higher regulatory target. As this option targets all packaging items, this projected performance is spread across all product types (beverage containers and non-beverage containers).

TABLE 14: SUMMARY OF CBA RESULTS FOR OPTION 2

	Sub-option		
	2 (a)	2 (b)	2 (c)
Cost (PV, millions)	\$251	\$553	\$1,107
Scheme design and implementation	\$3	\$6	\$6
Scheme operation and compliance	\$16	\$183	\$348
Collection, transport and recycling	\$158	\$218	\$438
Household participation	\$59	\$117	\$254
Business participation	\$14	\$29	\$61
Benefits (PV, millions)	\$263	\$492	\$910
Market value of resources recovered	\$146	\$291	\$554
Avoided costs of regulation	\$35	\$35	\$35
Avoided costs of landfill	\$29	\$59	\$114
Avoided costs of litter clean up	\$53	\$107	\$207
NPV (millions)	\$43	-\$24	-\$150
BCR	1.17	0.96	0.86

TABLE 15: SUMMARY OF RECYCLING AND LITTER PROJECTIONS FOR OPTION 2

Recycling projections (% packaging recycled)

	2010	2015	2020	2025	2030	2035
Base case	62.5	67.5	72.5	77.1	79.0	79.0
Option 2 (a)	62.5	67.5	75.4	79.4	80.6	80.6
Option 2 (b)	62.5	67.5	77.3	81.9	81.9	81.9
Option 2 (c)	62.5	67.5	80.0	83.2	85.7	86.4

Litter projections (% reduction by weight)

	2010	2015	2020	2025	2030	2035
Base case	0.0	5.0	5.0	10.0	10.0	10.0
Option 2 (a)	0.0	5.0	10.0	15.0	15.0	15.0
Option 2 (b)	0.0	5.0	11.1	15.4	15.4	15.4
Option 2 (c)	0.0	5.0	11.1	15.4	15.4	15.4

The differences in the recycling outcomes for the three sub-options are reflected in the willingness to pay estimates for increased recycling in Table 16 below, which range from \$233 million to \$402 million for option 2 (a) to \$689 million to \$1.2 billion for option 2 (c) (at the lower and upper confidence intervals). While these estimates cannot simply be added to the NPVs in Table 14, as there is an element of double counting involved, the scale of the potential non-market benefits suggests that all three of these sub-options could potentially be viable.

TABLE 16: SUMMARY OF WILLINGNESS TO PAY ESTIMATES FOR OPTION 2

Sub-option	Packaging recycling (PV, millions)			Litter
	Lower	Point	Upper	
2 (a)	\$233	\$295	\$402	N/A
2 (b)	\$422	\$534	\$727	
2 (c)	\$689	\$872	\$1,186	

Under sensitivity testing where benefits are reduced by 30 per cent and costs are increased by 30 per cent, the NPVs for option 2 (a) (-\$120 million) and option 2 (b) (-349 million) would still be offset by the lower bounds of the willingness to pay estimates for increased recycling of \$233 million for option 2 (a) and \$442 million for option 2 (b). The NPV for option 2 (c) under sensitivity testing where benefits are reduced by 30 per cent and costs are increased by 30 per cent (-\$769 million) is offset by the point estimate of the willingness to pay estimates for increased recycling of \$872 million.

DISTRIBUTIONAL IMPACTS

The distributions of costs and benefits across the economy would be different for option 2 than for option 1, as option 2 involves the packaging industry taking greater responsibility for end-of life packaging waste management.

The costs to government under option 2 would be relatively small and consist primarily in implementing and administering regulations and ensuring compliance. These regulatory costs, borne by the Commonwealth Government, would potentially be offset by the avoided costs of regulation by states and territories under current arrangements.

The costs to households and (non-packaging) businesses under option 2 would be limited to the participation costs of sorting recyclable materials and transferring them to recycling bins (ranging from \$73 million for option 2 (a) to \$315 million for option 2 (c)). It is uncertain what percentage of additional recycling would be sourced from at home or away from home under these sub-options, so the relativities between household and business participation costs may differ from the results of the CBA. Arguably, the packaging industry may seek to achieve the majority of its regulated obligation from the away from home sector. If you were to assume this, the participation costs would be higher for businesses and lower for households. In addition, under each of the sub-options, the packaging industry may seek to incentivise commercial recycling by covering the costs of business participation, so as to ensure it meets its regulated obligation.

Under each of the sub-options, the packaging industry would be responsible for incremental costs associated with scheme administration, communications, initiatives, infrastructure and compliance, which could be offset by the market value of additional resources recovered. These incremental costs to the industry are on top of the costs of the Australian Packaging Covenant, which were estimated in the 2010 RIS for the Australian Packaging Covenant to be around \$18 million per annum (EPHC 2010b, p. 23), and current voluntary industry action – both of which would be subsumed under each of the sub-options. The net incremental costs to the packaging industry are estimated to be \$18 million for option 2 (a), \$188 million for option 2 (b), and \$353 million for option 2 (c). As these sub-options involve a departure from current arrangements under the Australian Packaging Covenant, these cost estimates are uncertain and stakeholder feedback on costs is sought through the consultation process.

For option 2, there would also be savings for local governments for litter clean up and landfill operation, estimated to be \$82 million for option 2 (a), \$166 million for option 2 (b), and \$321 million for option 2 (c). There would also be savings for (non-packaging) businesses for the disposal of used packaging materials but these have not been quantified.

OPTION 3: MANDATORY ADVANCE DISPOSAL FEE

Option 3 involves the Commonwealth Government placing an advance disposal fee (ADF) on packaging materials, designed to influence the choices of manufacturers and specifiers of packaging. Revenue from the ADF would be used to fund packaging recycling and litter reduction initiatives.

For the purposes of the impact analysis in this Consultation RIS, it has been assumed that the suite of initiatives funded by the ADF would be equivalent to those undertaken by approved arrangements under option 2 (c). The costs to the economy of this option (\$1,107 million) are relatively high, but are almost offset by the estimated market-based and landfill externality benefits (\$910 million). The NPV for option 3 is estimated at -\$147 million (see Table 17 below).

The willingness to pay estimates for increased recycling from option 3 range from \$689 million to \$1.2 billion (at the lower and upper confidence intervals). While these values cannot be added to the results of the CBA, due to the issue of double counting, the scale of these estimates suggests that the non-market benefits of this option could potentially bridge the ‘gap’ between the market-based costs and benefits.

TABLE 17: SUMMARY OF CBA RESULTS FOR OPTION 3

CBA (based on market values)

Cost (PV, millions)	\$1,104
Scheme design and implementation	\$6
Scheme operation and compliance	\$345
Collection, transport and recycling	\$438
Household participation	\$254
Business participation	\$61
Benefits (PV, millions)	\$910
Market value of resources recovered	\$554
Avoided costs of regulation	\$35
Avoided costs of landfill	\$114
Avoided costs of litter clean up	\$207
NPV (millions)	-\$147
BCR	0.87

Willingness to pay estimates

Packaging recycling (PV, millions)			Litter
Lower	Point	Upper	
\$689	\$872	\$1,186	N/A

Table 18 outlines the projected increases in recycling and reductions in litter under option 3. Under this option, the percentage of packaging recycled is projected to increase to 86.4 in 2035, compared with an increase to 79 per cent in the base case. Litter is projected to decrease to 15.4 per cent in 2035 under option 3. This is more than the 10 per cent reduction in litter that is projected to occur under the base case. As this option targets all packaging items, this projected performance is spread across all product types (beverage containers and non-beverage containers).

Based on the CBA, the incremental costs of option 3 would be relatively equally split between the scheme operations funded by packaging industry through the ADF (\$351 million) and household and business participation costs (\$315 million). The costs for local governments and commercial businesses of collecting, transporting and recycling the additional materials flowing through the municipal and C&I waste streams (estimated at \$438 million) would be offset by the value of the recovered resources (\$554 million). In addition, local governments would benefit from avoided litter clean up (\$207 million) and landfill costs (\$114 million).

TABLE 18: SUMMARY OF RECYCLING AND LITTER PROJECTIONS FOR OPTION 3

Recycling projections (% packaging recycled)

	2010	2015	2020	2025	2030	2035
Base case	62.5	67.5	72.5	77.1	79.0	79.0
Option 3	62.5	67.5	80.0	83.2	85.7	86.4

Litter projections (% reduction by weight)

	2010	2015	2020	2025	2030	2035
Base case	0.0	5.0	5.0	10.0	10.0	10.0
Option 3	0.0	5.0	11.1	15.4	15.4	15.4

Under sensitivity testing where benefits are reduced by 30 per cent and costs are increased by 30 per cent, the NPV for option 3 is estimated to be -\$765 million, which is offset by the point willingness to pay estimate for increased recycling of \$872 million. This suggests that an economic case for implementing option 3 could potentially be made. However, while option 3 has relative certainty of costs, as the government will set the ADF at a level to generate sufficient revenue to fund the identified initiatives, it is less certain that the projected outcomes for option 3 would be achieved. Stakeholder feedback on these projections is encouraged.

OPTION 4: MANDATORY CONTAINER DEPOSIT SCHEME (CDS)

Option 4 represents two variations on a national CDS – option 4 (a) is a CDS proposed by the Boomerang Alliance; option 4 (b) is a hybrid CDS based on international case studies and the South Australian scheme. The key difference between these sub-options is the configuration of collection facilities. As option 4 (b) involves a more resource intensive collection network, the costs for this sub-option are higher.

As described in Table 19, both sub-options have very high costs and high benefits. Option 4 (a) is estimated to involve direct costs for developing and operating the scheme of \$4.40 billion, and household and business participation costs of \$432 million, offset by \$462 million in benefits from the resource recovery, \$2.77 billion in avoided collection, transport and recycling costs in the municipal and C&I waste streams, and \$210 million in other avoided costs (regulation, landfill and litter clean up). Option 4 (b) involves similar costs and benefits, with the principal difference being the higher scheme operation costs of \$4.73 billion. The NPV for option 4 (a) is -\$1,731 million, which suggests this sub-option would need to generate substantial non-market benefits and co-benefits to avoid imposing a cost on the Australian economy.

Table 20 shows the performance of option 4, which is projected to be the same for the two CDS sub-options for both packaging recycling and litter reduction. As Options 4 (a) and 4 (b) only target a subset of packaging (i.e. beverage containers), their performance is only predicted to differ from the base case with regard to beverage container recycling and the removal of beverage containers from the litter stream (as people will have a financial incentive not to litter these containers).

Both sub-options achieve higher national packaging recycling rates than the base case and higher litter reduction rates than the base case. However, performance is not projected to be as high as for other options that target all packaging. Nevertheless, option 4 achieves the highest beverage container recycling and litter projections of all of the options analysed, reaching 85 per cent beverage packaging recycling by 2020 and 30 per cent beverage litter reduction by 2030.

TABLE 19: SUMMARY OF CBA RESULTS FOR OPTION 4

CBA (based on market values)	Sub-option	
	4 (a)	4 (b)
Cost (PV, millions)	\$2,066	\$2,439
Scheme design and implementation	\$11	\$11
Scheme operation and compliance	\$4,391	\$4,728
Collection, transport and recycling	\$2,768	\$2,768
Household participation	\$426	\$462
Business participation	\$6	\$6
Benefits (PV, millions)	\$672	\$672
Market value of resources recovered	\$462	\$462
Avoided costs of regulation	\$35	\$35
Avoided costs of landfill	\$62	\$62
Avoided costs of litter clean up	\$113	\$113
NPV (millions)	-\$1,358	-\$1,731
BCR	0.34	0.29

TABLE 20: SUMMARY OF RECYCLING AND LITTER PROJECTIONS FOR OPTION 2

Recycling projections (% packaging recycled)

		2010	2015	2020	2025	2030	2035
All packaging	Base case	62.5	67.5	72.5	77.1	79.0	79.0
	Option 4 (a)	62.5	67.5	77.9	81.6	82.8	82.8
	Option 4 (b)	62.5	67.5	77.9	81.6	82.8	82.8
Beverage containers	Base case	48.7	53.8	58.1	66.8	69.7	69.0
	Option 4 (a)	48.7	53.8	80.0	85.0	85.0	85.0
	Option 4 (b)	48.7	53.8	80.0	85.0	85.0	85.0

Litter projections (% reduction by weight)

		2010	2015	2020	2025	2030	2035
All packaging	Base case	0.0	5.0	5.0	10.0	10.0	10.0
	Option 4 (a)	0.0	5.0	7.2	11.5	12.4	12.4
	Option 4 (b)	0.0	5.0	7.2	11.5	12.4	12.4
Beverage containers	Base case	0.0	5.0	5.0	10.0	10.0	10.0
	Option 4 (a)	0.0	5.0	25.0	25.0	30.0	30.0
	Option 4 (b)	0.0	5.0	25.0	25.0	30.0	30.0

The willingness to pay estimates for packaging recycling for option 4 range from \$465 million to \$801 million (at the lower and upper confidence intervals). While the upper bound of these estimates is not high enough to outweigh the net market-based costs to the economy of either option 4 (a) or 4 (b) under the CBA, it should be noted that willingness to pay values for reductions in litter were unable to be calculated. The non-market benefits generated by option 4 could be sufficient to offset the costs.

TABLE 21: SUMMARY OF WILLINGNESS TO PAY ESTIMATES FOR OPTION 4

Sub-option	Packaging recycling (PV, millions)			Litter
	Lower	Point	Upper	
4 (a)	\$465	\$588	\$801	N/A
4 (b)	\$465	\$588	\$801	

The key drivers for the costs of a national CDS are the capital and operating costs of collection facilities. These costs are traditionally calculated on a per container basis and expressed as a container handling fee. The container handling fees for option 4 (a) were assumed to be 4.5 cents/container for hubs, collection centres and reverse vending machines (RVMs) and 6.0 cents/container for regional collection points. The container handling fees for option 4 (b) were assumed to be 5 cents/container for consolidation points and collection depots, 4 cents/container for RVMs and 6.0 cents/container for regional collection points. These costs are in line with current industry costs for the South Australian scheme. There are additional costs for system administration and for transporting containers to reprocessors. Further detail on how CDS costs were calculated can be found in Attachment C.

As options 4 (a) and 4 (b) are sensitive to the impact of these assumptions regarding costs, a sensitivity test was conducted based on reducing the capital and operating costs by 30 per cent. This exceeds the difference in cost estimates provided by the Boomerang Alliance on an ‘in confidence’ basis. The results of this test are outlined in Table 22 below. Assuming these lower costs results in lower NPVs for options 4 (a) and 4 (b), suggesting these sub-options could result in a net benefit to society based on non-market values. PwC noted that the results of this sensitivity test should be treated with caution as the cost estimates are lower than South Australian CDS costs and estimates used in recent published studies. Stakeholder feedback is sought on the reasonableness of the assumed capital and operating costs outlined above and in Attachment C.

TABLE 22: EFFECT OF REDUCING CAPITAL AND OPERATING COSTS BY 30 PER CENT FOR OPTIONS 4 (A) AND 4 (B)

	Option 4 (a)	Option 4 (b)
Cost (PV, millions)	\$750	\$1,022
Benefits (PV, millions)	\$708	\$708
NPV (millions)	-\$42	-\$314
BCR	0.94	0.69

DISTRIBUTIONAL IMPACTS

Option 4 is regulatory intervention that would substantially alter the end of life management of beverage containers across Australia. Consequently, the distributional impacts of this option are potentially more pronounced than for the other options analysed. The financial impacts of this option implemented in parallel with a kerbside recycling system are influenced by the materials attracting the deposit, the deposit value, the return system functionality and consumer behaviour (Nolan-ITU 2002, p. 7).

The costs to government under option 4 would be relatively small and consist primarily in implementing and administering regulations and ensuring compliance. These regulatory costs, borne by the Commonwealth Government, would potentially be offset by the avoided costs of regulation by states and territories, including the costs to the South Australian and Northern Territory governments of administering their CDSs.

The majority of the costs under option 4 would be borne by the beverage industry in running the CDS and funding the capital and operating costs of collection facilities. These costs are estimated to be \$4.40 billion for option 4 (a) and \$4.74 billion for option 4 (b). Operating costs exceed the value of materials that are collected, estimated to be \$462 million for both options. As outlined in Attachment C, a CDS would achieve a cleaner recycling stream than kerbside and C&I collection, so higher prices could be obtained for recovered materials, and this has been reflected by applying a price premium to CDS materials in the CBA analysis.

Under option 4, a large quantity of recyclable materials would be diverted from the kerbside and C&I collection systems. This would lead to estimated avoided costs for local governments and commercial businesses of \$2.77 billion for both sub-options. There would also be lost benefits for these parties from the value of recovered materials, estimated to be \$462 million for both options. The net saving to local governments and commercial businesses would be \$2.31 billion. In addition, there would be savings for local governments for litter clean up and landfill operation of \$175 million for both sub-options.

As with other options, households and businesses would incur participation costs under option 4 in sorting recyclable materials and transferring them to recycling bins. There would also be participation costs for households in transporting beverage containers to collection facilities. In total these costs are estimated to be \$432 million for option 4 (a) and \$468 million for option 4 (b).

Under option 4, beverage consumers would in theory be required to pay a 10 cent deposit on beverages, which would be an upfront cost to households and businesses. When containers are redeemed, the party that redeems the container would receive the 10 cent refund. In most cases it is assumed this would be the consumer, so there would no net cost to them from the deposit. If consumers choose to dispose of their beverage containers in kerbside or C&I recycling bins, the operator of the collection service would reap the benefits of the deposit. If consumers choose to litter the containers, the party that picks up the littered container can redeem it for the deposit amount. These would effectively be financial transfers from the consumer to their local government, waste service provider or another party. For the proportion of containers that are not redeemed (projected to be 15 per cent from 2025), the operator of the CDS would, in theory, retain the deposit. This would be a financial transfer from the consumer to the beverage industry.

In practice, market forces will determine the actual extent to which beverage companies incorporate the deposit into the price of beverages. Industry may choose to either pass through to consumers a portion of the deposit or the net costs of operating the scheme. As all of these financial flows described above are transfers, as opposed to costs or benefits to the economy, they have not been quantified in the CBA. Nevertheless, the financial impacts of these flows for certain affected parties could be substantial.

6.4 RISKS, CONSIDERATIONS AND ISSUES

All options assume continuation of recycling and litter activities undertaken in the base case. As mentioned in earlier chapters, packaging waste is a complex issue, spanning a range of materials in use throughout the economy. The base case comprises a range of well-established arrangements and infrastructure already in place to deal with packaging, as well as other recyclable materials. These include kerbside collection arrangements and container deposit schemes. Given this, there are a number of risks that may impact on the performance of these options.

GENERAL RISKS

- Material values for recyclate are based on global commodity prices which impact on demand for recycling. Increases in the value of recyclate can help reduce the costs to liable parties under these options. Equally, decreases in value could lead to lower recycling rates and increase compliance costs for liable parties.
- Transport costs greatly affect the cost of recycling in a national scheme. Any market change in transport costs (e.g. the price of petrol) would have flow on effects to individual options.
- There is a degree of uncertainty about the type of entities that would be regulated under the various options. Consumer packaging is an economy wide good and therefore it is not known how many businesses would be impacted.
- Regulatory obligations may have an impact on existing voluntary and co-regulatory initiatives such as the Australian Packaging Covenant and the Packaging Stewardship Forum for example through membership levels.

OPTION 1: NATIONAL PACKAGING WASTE STRATEGY

- Option 1 entails the development of a national packaging waste strategy funded from additional resources. There is no guarantee that governments would be able to obtain the necessary new funds for this option.
- The delivery of stated outcomes is not guaranteed under option 1 as it is not a regulated option. It may also have greater exposure to fluctuations in the domestic economy.

OPTION 2: CO-REGULATORY PACKAGING STEWARDSHIP

- Option 2 is assumed to no longer involve government membership, as with the current Australian Packaging Covenant, but to only include liable parties that are involved in the packaging supply chain. If state and territory governments no longer participate in funding decisions, there is a risk that the actions undertaken by approved arrangements may not be coordinated with government programs.
- Local governments are responsible for a significant proportion of existing recycling activity through kerbside recycling services. There is the potential that some local governments may reduce or withdraw these services as a result of increased responsibility for packaging recycling shifting to the private sector (particularly the national extension of kerbside recycling to SMEs on a commercial basis). However, reducing kerbside collection volumes is not the intention of option 2.
- In addition, the commitment of local governments to participate in the initiatives identified for the sub-options is not guaranteed.
- In addition to addressing the obligations under option 2 (a), liable parties under options 2 (b) and 2 (c) must also focus on 'key problem areas'. Industry information has been relied on to identify the costs of addressing these problem areas. However, these costs may also increase over time.
- Administrative complexities as a result of differential treatment of beverage and non-beverage packaging under options 2 (b) and 2 (c) could increase business costs for liable parties.
- There may not be the infrastructure in terms of recycling and recovery to deal with problem materials, therefore set-up costs may be high for this option.

OPTION 3: MANDATORY ADVANCE DISPOSAL FEE (ADF)

- The definition of packaging is critical in delivering the outcomes for this option. There may be perverse impacts through the desire to avoid the ADF such as changing the material type of packaging.
- The administration of the ADF would need to be developed and there would be additional costs imposed on industry in terms of reporting and accounting.
- The imposition of an ADF may also raise World Trade Organisation concerns. This option would need to be compliant with international trade treaties.

OPTION 4: MANDATORY CONTAINER DEPOSIT SCHEME (CDS)

- Under option 4, consideration could be given to prohibiting the sale, import and manufacture of non-recyclable beverage containers. This would also need to be designed so that it is compliant with international trade treaties.
- Consideration must also be given to how importers of beverages would participate in option 4. Issues would need to be addressed relating to compliance.
- While option 4 has the potential to deliver co-benefits through the collection of other non-deposit materials at collection facilities, there is also a possibility that non-deposit materials will be diverted from kerbside collection systems along with the significant quantities of beverage containers. This could threaten the viability of some local government kerbside schemes (Perchards 2002, p. 3) if it removes the economies of scale.
- A national CDS would likely increase the price of beverages at the point of sale. Depending on the elasticity of consumer demand for beverages, this would potentially impact on sales and reduce beverage companies' profits. There could be flow on effects for workers employed in the beverage manufacturing and ancillary industries (freight, retail, etc.).

6.5 IMPACTS ON COMPETITION

As option 1 is a non-regulatory option consisting of coordinated government actions, there would not be any impacts on competition.

Options 2 and 4 involve industry taking greater responsibility for managing the end of life disposal of consumer packaging and/or beverage containers. It is possible that the formation of approved arrangements or Product Stewardship Organisations (PSOs) to meet obligations under these options may have the effect of restricting competition. In designing the regulations for these options, the government will need to consider any potential competition impacts and advice on this matter may need to be sought from the Australian Competition and Consumer Commission. In addition, consideration will need to be given to an appropriate threshold for industry obligations, to avoid placing too onerous a burden on small and medium-sized business. The Australian Packaging Covenant and NEPM arrangement currently has a threshold of \$5 million annual turnover.

Option 3 would place an ADF on packaging. As it does not involve the formation of approved arrangements or PSOs, it is less likely to restrict competition than options 2 and 4.

6.6 QUESTIONS FOR CONSULTATION

Stakeholders are welcome to provide feedback on any aspect of this chapter. The following questions have been formulated to provide a starting point for submissions:

- Are the projected rates for packaging recycling and litter reduction realistic?
- Are the costs and benefits identified for each option realistic? Are there any additional costs or benefits that should be factored into the CBA? Are you able to provide data to back up your views?
- What impact, if any, would the options have on packaging consumption, for example would the options lead to a reduction in consumption levels?
- Do the options provide opportunities for increasing the recycling levels of other materials? If so, to what extent.
- What is the likely impact of the options on costs to households and businesses?
- What is the likely impact of the options on kerbside collection systems?
- What effects are the options likely to have on competition? Are any of the options likely to restrict competition?
- What might be appropriate thresholds for industry obligations under option 2?

7 CONSULTATION

Consultation with key stakeholders and the broader community is a key part of the policy development process. The aim is to help identify additional information on impacts, costs and benefits, to better understand how proposed actions may affect particular stakeholder groups and to provide transparency in decision making.

This Consultation RIS provides a key part of the consultation process. Extensive stakeholder consultations have been undertaken in order to develop the Consultation RIS and the Consultation RIS itself provides a vehicle for further consultation. During development of the Consultation RIS, stakeholders were consulted on the nature and extent of the problems with packaging and on options to address those problems. Further in-depth discussions were undertaken with two particular stakeholder groups, the Boomerang Alliance and the Packaging Stewardship Forum, to scope specific options identified for inclusion in the Consultation RIS.

The release of the Consultation RIS provides an opportunity for stakeholders and the broader community to understand the nature and scale of waste packaging impacts and the options being considered for addressing these impacts, and to provide feedback on these issues.

7.1 CONSULTATION DURING DEVELOPMENT OF THE CONSULTATION RIS

Consultation began directly following the July 2010 decision by EPHC to develop a Consultation RIS. In August 2010, the Australian Packaging Covenant Council was informed of the Consultation RIS development process. The Australian Packaging Covenant Council is a multi-stakeholder group, including government, local government, the packaging industry, recyclers and community groups that represents key stakeholders dealing with waste packaging impacts. The Australian Packaging Covenant Council has received subsequent updates on the Consultation RIS process at meetings held in November 2010 and February, May, August and November 2011.

Initial one-on-one consultation sessions with individual stakeholder groups took place between September and November 2010. This included consultations with Boomerang Alliance/Total Environment Centre, Coca-Cola Amatil, Westfield Group, Fosters Group, Visy, Keep Australia Beautiful, Australian Council of Recycling and Lion Nathan Limited. These groups were approached due to their active engagement with earlier national work on packaging impacts. The consultations identified a diversity of views on the proposed scope of the RIS, with some arguing strongly that it should only consider beverage containers and others supporting the EPHC position that it should maintain a broader scope in line with existing waste packaging policy. The later approach was considered to be more appropriate, because it allowed a range of waste packaging issues to be explored within the broader context of all packaging. The consultations also showed that there are strong community views both for and against CDSs and a strong interest in the RIS process as a means to determine the costs and benefits of implementing a national CDS.

To ensure broad input into the early stages of the RIS process, a formal stakeholder workshop was held in Sydney on 2 December 2010. Around 50 representatives from industry, government and environmental groups attended. The workshop focussed on seeking further data on waste packaging and its impacts, as well as gaining stakeholder input on packaging related market failures to feed into the draft problem statement. A key finding of the workshop was that there is limited data on packaging waste in Australia. While many stakeholders expressed an interest in providing data, very little additional data was

subsequently received. The workshop also found that stakeholders had limited knowledge of packaging related market failures, but had a good understanding of the impacts of the market failures and the range of options for addressing the impacts.

Stakeholders were invited to provide further written feedback following the workshop, including identifying any approaches they would like to see considered in the RIS. Submissions closed on 14 February 2011 and were received from Total Environment Centre, National Association of Retail Grocers of Australia, National Packaging Covenant Industry Association, Australian Packaging Covenant, Local Government and Shires Association of New South Wales and Revive Recycling. This stakeholder input was used to inform the drafting of the problem statement and options for the Consultation RIS.

Concurrently, a public tender process was held to choose a suitably qualified consultant to model the options and undertake the cost benefit analysis for the Consultation RIS. In June 2011, stakeholders were notified of the appointment of a consortium of consultants lead by PwC and were invited to attend a second formal stakeholder workshop in Melbourne on 18 July 2011 to refine and scope options for the Consultation RIS. Around 40 representatives from industry, government and environment groups attended.

Stakeholders at the workshop were invited to submit detailed proposals of options for inclusion in the RIS. This invitation was also extended to stakeholders that did not attend the workshop, but who had expressed an interest in the RIS process. The Boomerang Alliance, which had chosen not to attend the workshop, and the Packaging Stewardship Forum, which did attend, took up this offer and worked closely with officials and the consultants to develop options for inclusion in the Consultation RIS. Boomerang Alliance helped to develop Option 4 (a), a container deposit scheme. The Packaging Stewardship Forum helped to develop Option 2 (b), a co-regulatory industry product stewardship scheme.

From June 2011, PwC and WCS initiated structured stakeholder consultation to continue to inform the development of the problem statement and options to address the problems. This included extensive consultations with Boomerang Alliance and the Packaging Stewardship Forum to develop their options, as well as with Clean Up Australia, the Local Government and Shires Association of New South Wales, the Australian Packaging Covenant and the National Packaging Covenant Industry Association. The consultations have kept stakeholders abreast of the RIS development process, and have drawn on stakeholder knowledge and experience to inform development of the RIS.

7.2 CONSULTATION FOLLOWING PUBLICATION OF THE CONSULTATION RIS

The Consultation RIS is scheduled for release in early December 2011 and environment ministers are seeking community feedback by 30 March 2012. The 16-week extended consultation period ensures that people do not miss the opportunity to provide feedback following to the holiday period.

Formal public forums will be held to provide an opportunity for people to ask questions, discuss key issues and provide direct feedback. The forums will comprise an open session featuring presentations covering the background and key features of the Consultation RIS, followed by public discussion. Following the forum, bilateral meetings with interested parties will be offered.

The public forums will take place in February 2012 to give interested parties the opportunity to familiarise themselves with the Consultation RIS and to prepare written submissions. The forums will be conducted over a four-week period (anticipated to be between 6 February 2012 and 2 March 2012) and take place in

all capital cities (Sydney, Brisbane, Melbourne, Hobart, Perth, Adelaide, Darwin, Canberra) and three regional centres (Albury-Wodonga, Townsville, Bunbury).

Forum dates and locations will be published on the SCEW website when venues have been finalised. Please check www.ephc.gov.au for updates.

Written submissions should be sent by 30 March 2012 to:

SCEW.secretariat@environment.gov.au

Standing Council on Environment and Water Secretariat
GPO Box 787 Canberra, ACT 2601

Contact number for general enquiries: (02) 6274 1819

The closing date for submissions is 30 March 2012. Late submissions will not be accepted. 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.

The Consultation RIS gives an overview of the nature and scale of the problems with waste packaging and their impacts, and provides an analysis of options to address these impacts. This analysis draws together estimates of costs and benefits for each of the options and compares them to the base case.

Drawing together the key findings of the analysis so far, the following conclusions can be drawn.

- **Options 1 and 2 (a) show a small net benefit based on market values alone**

The analysis indicates that these options show a small net benefit based on market values and landfill externalities alone, without considering the non-market benefits expressed in the willingness to pay values. These options represent relatively small investments for relatively small benefits, which result in improvements only slightly above the base case. All other options show a net cost when considering the market values only.

- **The pace of improvement makes a significant difference in non-market benefits**

The similarity in overall outcomes (improved recycling and litter reduction) would appear to support maintaining the status quo or pursuing the low cost options that demonstrate a small net benefit, options 1 and 2 (a). However, the pace of change makes a significant difference when considering non-market benefits (as expressed in the willingness to pay values). These benefits are additive and accrue over time: for each percentage improvement over the base case, the community benefits and these benefits are added year on year. Therefore, for example, the quicker the recycling rate is increased above the base case, the higher the benefit is in the long run. This is why options 2 (c) and 3 achieve a willingness to pay for recycling point estimate benefit of \$1.2 billion, while option 2 (a) only achieves \$295 million, even though their overall recycling rates at 2035 are relatively similar (options 2 (c) and 3 achieve a 23.9 per cent improvement over the 2010 packaging recycling rate, while option 2 (a) achieves an 18.1 per cent improvement).

- **Considering the willingness to pay for recycling values indicates that all of the options could potentially show a net benefit, except options 4 (a) and 4 (b)**

The cost benefit analysis has not included the non-market benefits represented in the willingness to pay for recycling values due to the possibility of double counting. The extent to which the willingness to pay values include market values is not known. However, the 2010 PwC choice modelling study, which generated the willingness to pay values, also asked respondents about their reasons for valuing improvements. The majority of respondents listed reasons that were not based on market values, such as “conserving resources for future generations” and “to be more socially responsible” (PwC 2010, p. 34). These responses indicate that it is unlikely that market benefits, i.e. the value of resources and reduced landfill costs, make up a major portion of the willingness to pay values. Therefore, while it is not possible to add the willingness to pay values to the market values directly, a comparison of the willingness to pay values to the net present market values of the options can be useful for considering the potential overall net benefit or cost of the options.

TABLE 23: COMPARISON OF CBA RESULTS TO WILLINGNESS TO PAY INTERVAL VALUES FOR RECYCLING

	Option 1	Option 2 (a)	Option 2 (b)	Option 2 (c)	Option 3	Option 4 (a)	Option 4 (b)
CBA NPV (millions)	\$2	\$43	-\$24	-\$150	-\$147	-\$1,358	-\$1,731
Increased recycling							
Lower	\$234	\$233	\$422	\$689	\$689	\$465	\$465
Point	\$296	\$295	\$534	\$872	\$872	\$588	\$588
Upper	\$403	\$402	\$727	\$1,186	\$1,186	\$801	\$801

The comparison in Table 23 indicates that for options 1 through 3, the size of the willingness to pay benefits is considerably greater than the net present market values. Even taking a conservative estimate of willingness to pay and using the lower confidence interval values, the scale of the potential willingness to pay benefits suggests that options 1 through 3 are likely to result in a net benefit to the economy when factoring in non-market values. However, this is not the case for options 4 (a) and 4 (b), which show greater costs than potential benefits even when the upper confidence willingness to pay interval is considered.

- **The analysis of the options does not include potential benefits from the willingness to pay for litter reduction or co-benefits**

Environment ministers recognise and acknowledge that the analysis contained in this Consultation RIS does not include all potential benefits that may result from the options. As indicated, the willingness to pay for litter reduction values and the co-benefits from increasing the recycling of non-packaging materials and reducing non-packaging litter were considered to be too complex to attribute to individual options in the time allowed. The extent to which these benefits are likely to impact on the overall results is difficult to predict. All of the options are likely to gain from these additional benefits, since all include initiatives that reduce packaging litter and all are likely to increase recycling of non-packaging materials. Some are also likely to see significant reductions on non-packaging litter as a result of anti-littering education campaigns and improved infrastructure and enforcement. Environment ministers would welcome further input from the community on these issues.

In conclusion, given the uncertainty around the assumptions, estimates and some of the benefits, environment ministers consider it inappropriate to indicate a preferred option at this time. Environment ministers consider the consultation process to be an important part of the validation process for these assumptions and estimates, and an opportunity for the community to put forward additional evidence to support or change the analysis.

Environment ministers will consider the key findings of the work to date and the feedback from the community received during the consultation period before considering further action on this issue.

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