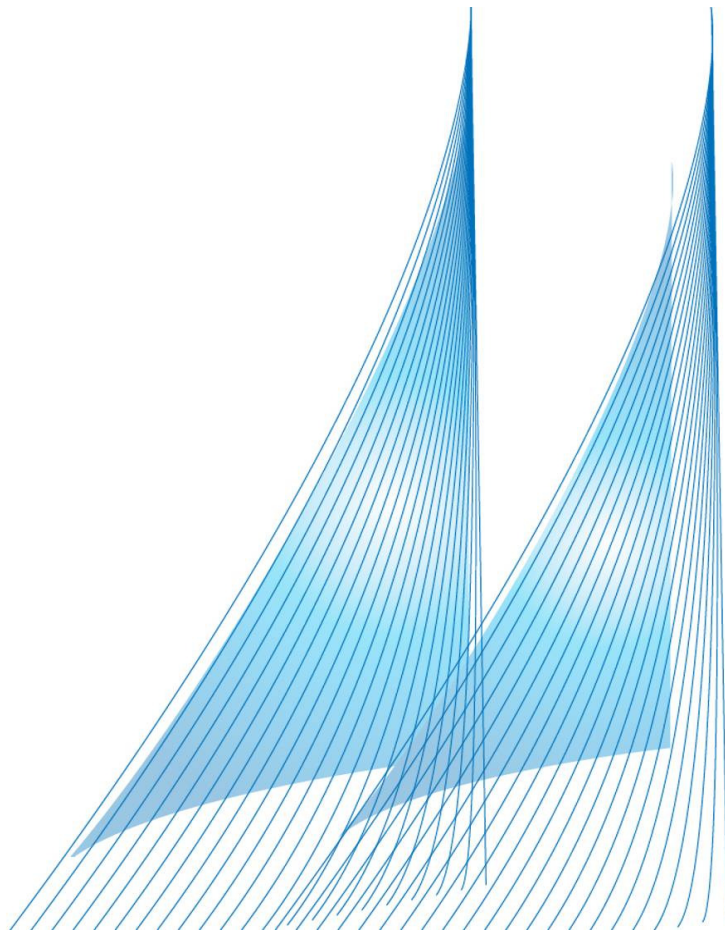


## **Preliminary Report**

# **BEST PRACTICE INTERNATIONAL PACKAGING APPROACHES**

Prepared for PwC on behalf of the EPHC and the Packaging Impacts  
Consultation Regulation Impact Statement

November 2011



**Martin Stewardship & Management Strategies Pty Ltd**



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## GLOSSARY

~	Approximately
\$	Australian Dollar
ADF	Advance Disposal Fee
ARF	Advance Recycling Fee
CAD	Canadian Dollar
CDS	Container Deposit Scheme or System, also known as container deposit legislation or CDL
CHF	Swiss Francs
COAG	Council of Australian Governments
CRF	Container Recycling Fee
CRIS	Consultation Regulation Impact Statement
DKK	Danish Krone
DRS	Dansk Retursystem A/S (Denmark)
DSD	Duales System Deutschland (Germany)
EC	European Community <sup>1</sup> .
EPHC	Environmental Protection and Heritage Council
EPR	Extended Producer Responsibility
EUR	Euro
FDOR	Florida Department of Revenue
GPN	Grønt Punkt Norge (Norway)
MS2	Martin Stewardship & Management Strategies Pty Ltd
NOK	Norwegian Kroner
NZD	New Zealand Dollar
PET	Polyethylene Terephthalate
PRO	Producer Responsibility Organisation, also known in Australia as Product Stewardship Organisation
PRS	PET-Recycling Schweiz (Switzerland)
RVM	Reverse Vending Machine
SEK	Swedish Krona
TV	Television
UK	United Kingdom
US	United States (of America)
VAT	Value-Added Tax

## EXECUTIVE SUMMARY

MS2<sup>2</sup> has been commissioned to conduct research and analysis for a range of overseas schemes and approaches for packaging recovery, recycling and litter reduction in support of the Packaging Impacts Consultation Regulation Impact Statement (CRIS) being conducted for Australia's Environment Ministers, serving as the Environmental Protection and Heritage Council (EPHC). Other project partners will examine Australian approaches and conduct the cost-benefit analysis for the CRIS.

Various schemes considered to date in Australia in addition to the Packaging Covenant included a national container deposit scheme (CDS, also known as container deposit legislation or CDL), an advance disposal fee<sup>3</sup> (ADF) and actions targeting away from home recycling. This report examines a range of overseas models for these approaches including the following:

Policy Instrument	Models Examined
Container deposit schemes	Norway California British Columbia Denmark Sweden
Advance disposal / recycling fees	Florida ADF on cans, bottles, jars and beverage containers Swiss ADF on glass
Industry-driven producer responsibility schemes	Swiss packaging programs Fost Plus Belgian Green Dot scheme
Alternate approaches	New Zealand Glass Packaging Forum

This report also proposes Australia-specific versions of the following shortlisted models for further evaluation in the CRIS:

- British Columbia's CDS; and
- A hybrid producer responsibility approach incorporating features of the following:
  - The Swiss ADF on glass;
  - Industry-driven Swiss packaging programs;
  - The New Zealand Glass Packaging Forum; and
- Other models to assist in tailoring to Australian conditions.

This shortlist of viable approaches for consideration in an Australian context was developed in consultation with project partners and based primarily on potential to tailor features of the approach to Australian conditions in order to ensure feasibility of the approach and potential fit with the Council of Australian Government's Principles of Best Practice Regulation. Particular regard was given to existing Australian infrastructure and recycling systems in order to minimise potential negative impacts of program introduction. Additional considerations included potential:

- tangible impact on recovery rates or litter reduction;
- alignment with identified problems in the CRIS process; and
- likely positive cost-benefit result.

## INTRODUCTION

MS2<sup>4</sup> has been commissioned to conduct research and analysis for a range of overseas schemes and approaches for packaging recovery, recycling and litter reduction in support of the Packaging Impacts Consultation Regulation Impact Statement (CRIS) being conducted for Australia's Environment Ministers, serving as the Environmental Protection and Heritage Council (EPHC). Other project partners will examine Australian approaches and conduct the cost-benefit analysis for the CRIS.

The packaging waste policy approaches considered in the *Beverage Container Investigation*<sup>5</sup> (BDA report) in addition to the Packaging Covenant included a national container deposit scheme (CDS, also known as container deposit legislation or CDL), an advance disposal fee (ADF) and actions targeting away from home recycling. This report examines a range of overseas models for these approaches and proposes Australia-specific versions of shortlisted models for further evaluation in the CRIS.

Advocates have promoted CDL as a means of establishing a national system of depots that could be used to collect a range of products under product stewardship schemes, such as the recently introduced TV and computer product stewardship scheme. While there would likely be some synergies between the different collection and recycling schemes, consultation and more detailed development of approaches are necessary to ascertain potential costs and benefits of such an approach. For instance, factors such as retailer involvement, drop-off options and logistical needs would need to be investigated.

In addition to depots and retail return, another approach for collecting beverage containers for recycling is the use of reverse vending machines (RVMs). European CDS systems primarily use RVMs, into which packaging is inserted, scanned, sorted by material type and processed (glass bottles and aluminium cans are crushed, plastic bottles are shredded) into separate bins to minimise storage requirements. After the packaging has been inserted into the RVM, consumers receive refund slips to redeem inside the store for their deposit amounts. A variety of RVM systems are also in place to help collect similar packaging types that are not subject to deposits, whilst usually providing some sort of loyalty benefit or similar reward<sup>6</sup>.

### *Approaches Evaluated and Rationale*

Additional approaches and variants of the approaches examined in the BDA report are being examined to ensure CRIS conformance with the Council of Australian Governments (COAG) principles for best-practice regulation<sup>7</sup>. This is necessary to address COAG requirements for consideration of a range of feasible policy options, not restricting competition unless various criteria are satisfied, ensuring that regulation remains relevant and effective over time, 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.

The CDS approach examined in the BDA report is based on California's CDS, which requires significant government involvement that could conflict with COAG requirements and with Australia's *National Waste Policy* objectives for increased product stewardship. Under modern producer responsibility / product stewardship approaches, government involvement is minimised.

From the early 1990s to the present, California has reduced staff administering the state CDS program from over 300 staff to less than 200 due to program evolution and improved software and tracking. However, California's CDS requires significant government intervention. California has also recently

withheld payments to recyclers in order to address state budget gaps and has failed to remain effective over time without deposit increases and strengthened public education to accompany the deposit increases.

In another example, Dansk Retursystem, the Danish deposit organisation, has 300 staff. This is much higher than the number of employees needed to run a producer responsibility organisation. For example, FOST Plus, which handles all consumer packaging in Belgium, has a staff of 55.

European CDS systems have industry-led centralised deposit clearing arrangements to simplify consumer container redemption at participating retailers. All US programs (except California and Hawaii, which have State authorities serving this function) rely on individual operators to provide clearing arrangements. These alternative arrangements have not been effectively considered.

South Australia's CDS program, one of the earliest mandatory deposit programs ever introduced, based its system around existing depots for returning refillable bottles, so infrastructure was already in place. Refillable beverage containers have now disappeared from Australia, so recovery methods and consumer attitudes to returning refillables are now gone. A much broader range of containers types, material types and recovery systems are available now compared to the limited options available when CDS was first introduced; an effective CDS must be able to incorporate such changes.

South Australia's 'supercollector' contractual arrangements will also need to be considered as the Northern Territory government seeks to implement a CDS based on South Australia's system. South Australia's current arrangements do not provide incentives for brand owners or fillers to help increase recovery rates. In contrast, program operators in CDS programs such as British Columbia's are held accountable for a variety of performance-based outcomes.

The option of an industry-driven CDS such as Encorp Pacific's program in British Columbia was not evaluated in the BDA report. This approach could minimise government oversight and provide industry the flexibility to keep program costs lower whilst delivering performance for recycling and litter management that meets or exceeds California's CDS. Ability to incorporate retail return and the use of RVMs (core components of various European systems) also need to be considered.

The CDS feasibility study for Tasmania proposed a 'hybrid' approach intended to optimise container recovery and incorporate features of modern systems, however the impacts of such an approach have not been addressed nationally. The Tasmanian study also detailed various trade-offs in deposit amounts, scope of containers, handling fees and governance arrangements.

The ADF evaluated in the BDA report has never been implemented to our knowledge. ADF approaches such as Florida's ADF on packaging and the industry-driven Swiss ADF on glass containers were not evaluated. These packaging ADFs are more targeted, not spread across all packaging types as in the BDA report.

In conjunction with Perchards Ltd, MS2 evaluated both the Encorp Pacific CDS program and the industry-driven Swiss packaging programs in detail for the Australian Government in an analysis of product stewardship in North America and Europe<sup>8</sup>. In the same report, MS2 and Perchards critically examined the German and UK packaging schemes to advise the Australian Government on how and why these schemes became costly and less effective than others, so that their lessons can be learnt for Australia. Germany's Green Dot and impacts resulting from Germany's introduction of container deposits on top of comprehensive recycling were specifically addressed. Belgium's Fost Plus program is considered here as a more practical, effective example of Green Dot implementation than Germany.

Across each approach, its fit with and impacts upon existing infrastructure and systems needs to be considered. Product stewardship schemes that feature collaboration with affected stakeholders and which build on the strengths of existing infrastructure, systems and networks (as for Minnesota's e-waste scheme and the US Product Stewardship Institute's approach to mercury-containing products) are more likely to have better results and may require shorter lead times to implement<sup>9</sup>.

The models to be examined in this study, based on consultations with the EPHC working group, are in Table 1.

**Table 1: Policy Instruments Examined**

Policy Instrument	Models Examined
Container deposit schemes	Norway California British Columbia Denmark Sweden
Advance disposal / recycling fees	Florida ADF on cans, bottles, jars and beverage containers Swiss ADF on glass
Industry-driven producer responsibility schemes	Swiss packaging programs Fost Plus Belgian Green Dot scheme
Alternate approaches	New Zealand Glass Packaging Forum

When comparing European and Australian recycling rates for packaging, it is important to understand that Europe counts the tonnage delivered to a reprocessor whereas Australia counts the output from the reprocessor. Depending on the quality of the collection and sorting system, discards at the reprocessor may be as high as 20%-30% (for example, in France some 15% of the plastic bottles delivered to recyclers are subsequently landfilled<sup>10</sup>). This means that in Australian terms, European recycling rates are not as high as they might appear.<sup>11</sup>

## Methodology

In describing and providing detail of each approach, a consistent analytical framework was applied through desktop research and/or consultations with international contacts to develop a transparent, uniform description of each approach that allows for more consistent comparisons. This approach is to be aligned with that applied by project partners in the identification of Australian approaches and definition of Australian-stakeholder proposals.

Primary reference documents for European schemes examined include the Perchards Packaging Information Service, ERM 2008, and publicly available reports about the programs in question, as referenced. Special thanks are due to Perchards for independent review and technical support of European models, and to Fost Plus for providing an English translation of their recent annual report prior to its public release. Encorp Pacific was especially helpful in reviewing program details.



The following exchange rates (current as of June 2011) have been used:

- CAD 1 = A\$1.02
- CHF 1 = \$1.19
- DKK 1 = \$0.19
- EUR 1 = \$1.42
- NOK 1 = \$0.18
- NZD 1 = \$0.80
- SEK 1 = \$0.16
- US \$ 1 = \$0.98

A shortlist of viable approaches for consideration in an Australian context was developed in consultation with project partners and based primarily on potential to tailor features of the approach to Australian conditions in order to ensure feasibility of the approach and potential fit with COAG's Principles of Best Practice Regulation. Particular regard was given to existing Australian infrastructure and recycling systems in order to minimise potential negative impacts of program introduction. Additional considerations included potential:

- tangible impact on recovery rates or litter reduction;
- alignment with identified problems in the CRIS process; and
- likely positive cost-benefit result.

Shortlisted approaches were analysed with a framework that included:

- range and significance of packaging material or container types included
- indicative refund or fee amounts
- transparency of financial flows and visibility to consumers
- collection coverage and estimated impacts on participation costs
- drop-off centres or public place recycling bins per unit of population
- types of collection facility (depots, reverse vending machines, drop-off centres, etc)
- operational and management aspects
- indicative participation rates that could reasonably be anticipated
- management and indicative funding allocations of program funds

## CONTAINER DEPOSIT SCHEMES

Under CDS, a deposit is placed on certain non-refillable beverage containers in order to motivate consumers to return the containers for recycling and have the deposit refunded. Alternatively, where consumers forego the deposit by leaving the containers in council recycling programs or littering the containers, councils can redeem the deposit through kerbside collections and individuals can pick up littered beverage containers to return them for the deposit.

Placing a value on certain containers means that CDS can result in increased beverage container recovery and decreased beverage container litter. Although recovery rates are regularly monitored and reported, most CDS programs do not monitor and report on litter impacts. This is because either a) the



program was intended to promote the use of refillable containers or b) beverage container litter is minimal and therefore not worth the expense of monitoring effectively<sup>12</sup>.

In addition to producer responsibility provisions addressed later, the German Packaging Ordinance of June 1991 sought to protect refillable bottles (especially refillable beer bottles) against competition from non-refillable bottles and cans, and it provided for mandatory deposits to be imposed as a penalty should the market share of refillables fall below the 1991 rates. This eventually happened, and a CDS was introduced in 2003.

There are some features common across the three European CDS models examined (Denmark, Sweden and Norway) that can have a significant impact on program operation and affect the potential applicability of these approaches in Australia. These common features include:

- A highly concentrated grocery retail trade, with a small number of chains representing over 90% of the market in each country. This makes it easier to ensure a good return network.
- Alcoholic drinks can be sold only through a state-owned retailer in each country, and taxes on alcohol are high.
- Cross-border purchases of deposit drinks, especially alcohol (driven largely by different rates of alcohol tax) affect all 3 systems. Resirk in Norway (where retail prices are the highest) handles many privately imported containers, particularly from Sweden. Returpack in Sweden benefits from not having to refund the deposit or handle the containers. DRS in Denmark handles many containers privately imported from Germany, where taxes are much lower. Retailers operate just on the German side of the border that are permitted to sell drinks to Scandinavians without charging the German deposit. The governments of the countries affected are endeavouring to harmonise the deposit systems to some extent, to handle these cross-border containers. These initiatives are under discussion through the Nordic Council and through the EU but would add to the operating costs of the systems.
- The CDS operator in each country now organises transport of deposit containers from the retailers. Each has one or more processing centres where containers are counted, baled and transported for recycling.

## Norway

Although Norway is not a member of the European Union, under the European Economic Area Agreement, it has to comply with the EC *Packaging and Packaging Waste Directive*. However, Norway also has special measures relating to beverage containers. Apart from these, there are no statutory producer obligations for packaging, and no statutory recycling targets. Binding agreements were concluded between the Environment Ministry and packaging manufacturers in 1995, which were renewed in 2003. Along with other commitments, industry undertook to meet recycling and recovery targets. Producers have established a Green Dot recycling system, GPN (Grønt Punkt Norge) to meet those targets.

Unlike most jurisdictions with CDS, in Norway there is no specific legal obligation to charge a deposit on specified beverage containers. A regulation requires return systems for beverage containers (not necessarily with a deposit) to be approved. A 'material tax' is levied on all beverage containers (including refillables), with a discount for containers depending on the return rate achieved each year. This encourages producers to participate in return systems (any containers not participating in an approved system pay tax at the full rate) and it encourages return systems to achieve high return rates. In addition, non-refillable beverage containers are subject to a packaging tax known as the 'basic tax'.

The EFTA Surveillance Authority<sup>13</sup> has twice opened infringement proceedings against the basic tax under EU law on the grounds that the Norwegian approach gives preferential treatment to refillables. Norwegian authorities defend the legality of the tax and neither case proceeded to trial.

Key features of Norway's CDS program are provided in Table 2.

**Table 2: Key Features of Norway's CDS program**

Operation and management	Industry producer responsibility organisation Norsk Resirk operates a deposit system for metal (aluminium and steel/ ‘tinplate’) beverage cans and non-refillable PET bottles. A long-established deposit system for refillable beverage containers is still operated by the brewers, and some small producer-specific systems also operate. Green Dot system GPN is approved to handle beverage glass (without a deposit), and it has obtained approval to handle containers of milk and juice since these became subject to the material tax in 2000.																											
First Implemented	Return systems for beverage containers have been regulated since 1993. Producers and importers can choose what type of system to establish. Pre-conditions for regulatory approval of return systems are that they are expected to achieve a return rate of at least 25% and the returned containers must be recycled or reused. Resirk started operating in 1999.																											
Packaging material or container types included	The Regulation on return systems applies to containers of beverages in liquid form, including concentrates for dilution, except for powdered drinks.																											
Financial flows, funding source, liability point and transparency	<p><b>Deposit amount:</b> NOK 1 (~\$0.18) on packs of up to 50cl and NOK 2.50 (~\$0.44) for larger packs in sales between retailer and consumer. NOK 1.20 (~\$0.21) for packs of up to and including 50cl and NOK 3.00 (~\$0.53) for larger packs in sales between producer/importers and retailers. Deposit amounts were set by the Regulation on return systems in 1993 and have not changed since.</p> <p><b>Funding source:</b> Resirk’s revenues are from fees (joining fee, fee for each EAN code, and an administration fee for each container), unredeemed deposits and the sale of recovered materials. Resirk members (fillers and importers of filled beverage containers) pay a one-off joining fee of NOK 30,000 (~\$5,237) plus a one-off fee of NOK 5,000 (~\$888) for each EAN code supplied.</p> <p>Members also pay material-specific administration fees, which are adjusted from time to time to take account of secondary material prices and return rates. Current fees (from 1 February 2010) are shown below:</p> <table><tr><td><b>fee per unit</b></td><td><b>NOK</b></td><td><b>~\$</b></td></tr><tr><td>Aluminium cans</td><td>0.06</td><td>0.01</td></tr><tr><td>Tinplate cans</td><td>0.21</td><td>0.04</td></tr><tr><td>PET 0.5 litre or less</td><td>0.10</td><td>0.02</td></tr><tr><td>PET over 0.5 litre</td><td>0.11</td><td>0.02</td></tr></table> <p>Surcharges also apply to certain PET bottles:</p> <table><tr><td><b>fee per unit</b></td><td><b>NOK</b></td><td><b>~\$</b></td></tr><tr><td>Light blue PET</td><td>0.08</td><td>0.01</td></tr><tr><td>Dark blue PET</td><td>0.15</td><td>0.03</td></tr><tr><td>Bottles with a sleeve covering more than 75% of the surface</td><td>0.15</td><td>0.03</td></tr></table> <p>For automatic handling such as RVMs, retailers receive NOK 0.20 (~\$0.04) per crushed can and NOK 0.25 (~\$0.04) per crushed bottle. For manual handling retailers receive NOK 0.05 (~\$0.01) per can and NOK 0.10 (~\$0.02) per bottle.</p> <p><b>Liability point:</b> Drinks producers and importers participate in Resirk or GPN. The same producers are also liable to pay the taxes.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> Deposit amounts are labelled and financial flows, as independently verified, are detailed publicly in Norsk Resirk’s annual report. Containers in GPN may be marked with the Green Dot (marking is voluntary) and GPN also sets out its financial flows in an annual report.</p>	<b>fee per unit</b>	<b>NOK</b>	<b>~\$</b>	Aluminium cans	0.06	0.01	Tinplate cans	0.21	0.04	PET 0.5 litre or less	0.10	0.02	PET over 0.5 litre	0.11	0.02	<b>fee per unit</b>	<b>NOK</b>	<b>~\$</b>	Light blue PET	0.08	0.01	Dark blue PET	0.15	0.03	Bottles with a sleeve covering more than 75% of the surface	0.15	0.03
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<b>Management and allocation of program funds</b>	Norsk Resirk benefits financially from unredeemed deposits when return rates are low. However, owners do not receive a dividend. Producers must pay a larger administration fee when return rates are high, but the rise is more than offset by the reduction in the government's tax on bottles and cans. Higher return rates are therefore profitable for producers, retailers and consumers. According to Norsk Resirk, deposit refunds represent the company's largest outgoing, followed by handling fees paid to the collection points, transport, marketing and administration.
<b>Collection types and coverage</b>	<p>For 2009 in total, approximately 10,000 locations redeemed deposits and 3,400 RVMs were available. Most return points are in grocery stores (three chains represent ~90% of the market), and most large grocery stores have an RVM. Independent CDS depots do not operate in Norway. In recent years, Resirk has increased return options to boost the return rate (and thus increase the tax discount).</p> <p>Sites such as sports clubs can register with Resirk as a return point, and they receive the deposit plus a handling fee per sack of containers. Alternatively, Resirk distributes sacks to such sites and they can return the containers to the grocery store in the usual way, with deposit monies going to club funds. A similar arrangement operates in around 1,000 mountain huts, with the deposit monies going to local Red Cross volunteer rescue groups. Resirk also operates a "floating RVM" on a boat along the coast in the summer.</p> <p>Non-deposit containers are collected through GPN together with non-beverage packaging. Glass is collected in bring containers, while plastic and cartons are collected either in bring containers or kerbside. The return rate for the beverage containers has to be determined through sampling each year, to set the tax rate for each material. GPN also operates a special collection service for milk cartons from schools and nurseries.</p>
<b>Quantitative impacts on recycling and litter</b>	<p>Norsk Resirk's main goal is to "collect and recycle as much as possible, thus contributing to a better environment and lowering public environmental excise taxes"<sup>14</sup>. 92% of participating cans and 90% of participating non-refillable PET bottles were collected and recycled in 2010. This excludes containers originating abroad or bought tax-free without a deposit, although the system accepts a significant number of these containers and recycles them. Resirk instructs retailers not to refund the deposit on them.</p> <p>One area of difficulty flagged by Resirk is energy drinks, which have a return rate of less than 50 per cent<sup>15</sup>. Return rates for beverage containers handled through GPN in 2010 were: 90% of glass, 70% of plastics, 93% of school milk cartons and 85% of other beverage cartons.</p> <p>Quantitative data on impacts of the program on litter is not readily available. Resirk's arrangements with sports clubs and mountain huts are intended to capture containers of drinks consumed away from home. The authorities permitted Resirk to count in its return rate some containers that were not returned but which were recovered as energy. Resirk argued that they "did not contribute to litter".</p>
<b>Authorising legislation</b>	<p>The basic tax and material tax are regulated by Regulation no. 1451 of 2001, as amended. The rates of the tax, which increase each year in line with inflation, are set by the State Budget.</p> <p>The initial 1993 regulation, <i>Regulation T-1000 on Return Systems for Beverage Packaging</i>, is now consolidated into the <i>2004 Waste Regulation</i>.</p>

## California

California's CDS is different than most in that the State, rather than the beverage industry, is responsible for operating the program.

Key features of California's CDS program<sup>16</sup> are provided in Table 3.

**Table 3: Key Features of California's CDS program**

Operational and management aspects	The California Department of Resources Recycling and Recovery (commonly referred to as ‘CalRecycle’) administers the <i>California Beverage Container Recycling and Litter Reduction Act</i> .																								
First Implemented	First established in 1987.																								
Packaging material or container types included	Most beverages packaged in aluminium, glass, plastic and bi-metal containers are eligible for CRV. Containers of milk, medical food, infant formula, wine, 100% fruit juice in containers 46 ounces (~1.36 L) or more and vegetable juice above 16 ounces (~473 mL) are excluded. Distilled spirits are also not included.																								
Financial flows, funding source, liability point and transparency	<p><b>Refund amount:</b> Beverage containers covered under the act are subject to California Redemption Value (CRV), which is US \$0.05 (~\$0.05) for each beverage container less than 24 ounces (~710 mL) and US \$0.10 (~\$0.10) for each container 24 ounces (~710 mL) or greater.</p> <p><b>Funding source and liability point:</b> Distributors sell beverage containers to retailers and charge retailers the CRV; distributors pay the CRV to CalRecycle. Beverage manufacturers pay processing fees to CalRecycle, which then pays the processing fees to reproducers. Retailers charge the CRV to consumers. A flow chart is available as Figure 1.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> CRV values are labelled and advertised. Consumers can redeem up to 50 containers at a time by count, and audited conversion factors are available by material type for quantities over 50 containers<sup>17</sup>.</p>																								
Management and allocation of program funds	Program funds are used to pay CRV and handling fees to redemption facilities; CRV payments to municipalities; and fund education, auditing and program enforcement.																								
Collection types and coverage	<p>California does not own redemption centres. Recycling centers are certified by CalRecycle. Certified or registered programs as of April 2010 are<sup>18</sup>:</p> <ul style="list-style-type: none"><li>Processors - 181</li><li>Buyback Centers - 2,179</li><li>Kerbside programs - 579</li><li>Collection/Dropoff - 210</li><li>Community Service - 115</li></ul> <p>California operates ‘convenience zones’ within a one-half mile radius of most retailers to help ensure convenient redemption opportunities for consumers. When a convenience zone is unserved by redemption facilities, retailers within that convenience zone are responsible for redeeming containers.</p>																								
Quantitative impacts on recycling and litter	<p>California’s goal is to achieve an 80% recycling rate for CRV containers. Detailed auditing and reporting requirements enable remarkably detailed redemption and recycling data. Of ~20.3 billion CRV containers sold in 2010, ~16.5 billion were recycled, for an 84% recycling rate. Detailed quantities of containers sold and recycled, as well as reported recycling rates for selected container types in 2010 are<sup>19</sup>:</p> <table><tr><th>Container type</th><th>Sales (millions)</th><th>Recycled (millions)</th><th>Recycling rate</th></tr><tr><td>Aluminium cans</td><td>8,831</td><td>8,262</td><td>94%</td></tr><tr><td>Glass</td><td>2,925</td><td>2,482</td><td>85%</td></tr><tr><td>PET</td><td>8,048</td><td>5,479</td><td>68%</td></tr><tr><td>HDPE</td><td>328</td><td>302</td><td>92%</td></tr><tr><td>Bimetal cans</td><td>23</td><td>2.9</td><td>12%</td></tr></table> <p>Other plastic container types have recycling rates of 10% or less.</p> <p>Relevant quantitative data on impacts of the program on litter is not readily available.</p>	Container type	Sales (millions)	Recycled (millions)	Recycling rate	Aluminium cans	8,831	8,262	94%	Glass	2,925	2,482	85%	PET	8,048	5,479	68%	HDPE	328	302	92%	Bimetal cans	23	2.9	12%
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HDPE	328	302	92%																						
Bimetal cans	23	2.9	12%																						
Authorising legislation	<i>California Beverage Container Recycling and Litter Reduction Act of 1986</i>																								

Figure 1 shows container and financial flows for the California Beverage Container Recovery program, which is often categorised as CDS even though the California Government argues that the system of redemption payments makes it different.

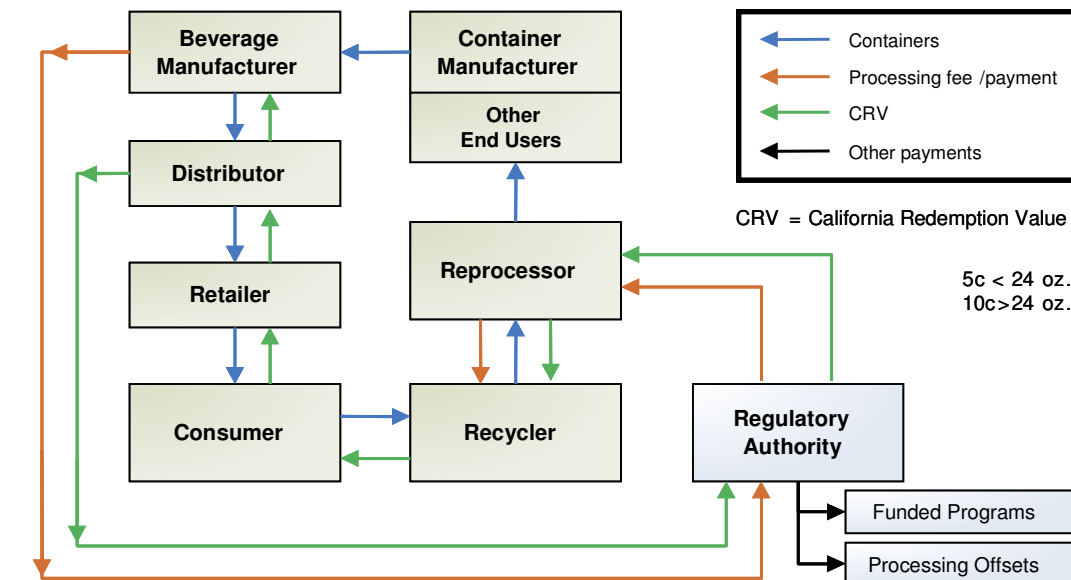


Figure 1: California Container and Financial Flows

## British Columbia

British Columbia's Encorp Pacific (Canada) (hereafter simply referred to as Encorp Pacific) is a not-for-profit product stewardship corporation intended to optimise recovery of consumer packaging and products<sup>20</sup>. The CDS program was originally implemented under the *Litter Act 1970*. The program's original form, Encorp Pacific Inc. was established in March 1994 by the major retail grocers and carbonated soft drink fillers to help standardise the collection system for used beverage containers under the province's CDS program. In addition to providing transport logistics, Encorp began to establish a network of privately-owned container redemption depots.

In 1997, the provincial government expanded the CDS to include all ready-to-drink beverages, excluding milk and milk substitutes. The Beverage Container Stewardship program took effect in October 1998. At the same time, Encorp Pacific (Canada) succeeded Encorp Pacific Inc. as a federally incorporated, not-for-profit, non-share capital, corporation. In September 2000, a consolidated stewardship plan was approved, which included polycoat (also known as aseptic containers, Tetra Paks or juice poppers) and stand-alone pouch containers into the CDS.

In 2001, Encorp Pacific began collecting non-refillable alcohol containers as a service provider to the British Columbia Liquor Distribution Branch. In 2007, these containers and the producers joined Encorp who then became the official stewardship agent for this category.

In 2006, Encorp Pacific began collecting dairy containers as a service provider under a voluntary, industry-led initiative by the British Columbia Dairy Council.

Key features of Encorp Pacific are provided in Table 4.

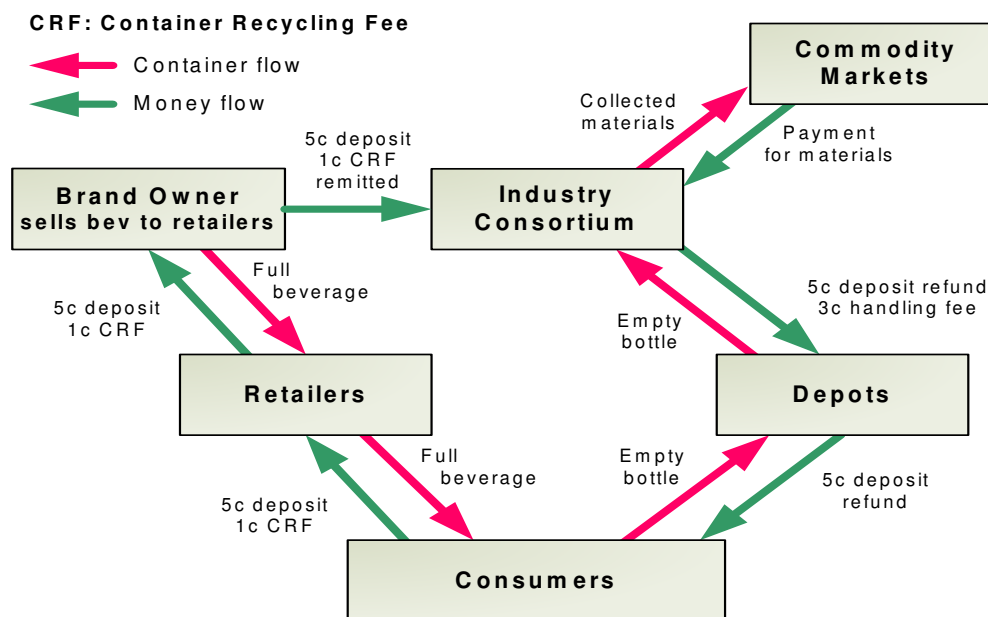
**Table 4: Key Features of British Columbia's CDS Program**

<b>Operation and management</b>	Non-profit producer responsibility organisation - Encorp Pacific (Canada)
<b>First Implemented</b>	First established in March 1994 as Encorp Pacific Inc.
<b>Packaging material or container types included</b>	Beverage containers (with a separate milk container program)
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Deposit and fee amounts</b><sup>21</sup>: Deposits range from CAD \$0.05 (~\$0.05) to CAD \$0.20 (~\$0.20), depending on container type and size. In addition to the deposits, a Container Recycling Fee (CRF) may be charged to help ensure the full costs of recycling each type of container are being recovered. As of June 2011, CRF values range from nil on certain drink box and pouches, as well as bi-metal cans &gt; 1L to CAD \$0.12 (~\$0.12) on glass containers. Handling fees per container are paid to depots in addition to deposits. The handling fee rates vary by container type and size but average CAD \$0.047 (\$0.048) overall<sup>22</sup>.</p> <p><b>Funding source</b>: Unredeemed deposits from beverage containers; CRFs that may be charged to help ensure the full costs of recycling each type of beverage container are being recovered; revenue from the sale of aluminium and plastic scrap; and revenues from service provider contracts.</p> <p><b>Liability point</b>: Liability rests with the filler/importer that first places eligible drinks on the market; they initiate a deposit, which is charged through to the final consumer and the deposit is redeemed when the container is returned for recycling.</p> <p><b>Transparency of financial flows and visibility to consumers</b>: Annual reports and audited financial statements have been made publicly available since 2001. Material flows and financial flows are precisely tracked and particularly transparent. Encorp Pacific's financial statements are prepared in accordance with standard Canadian accounting principles, with independent auditors conducting annual audits and verification of financial statements.</p> <p>Revenues for 2010 were<sup>23</sup> CAD 95 million (~\$96.6 million) – comprising 58% from CRFs, 16% from unredeemed deposits, 14% from sales of recyclable material and 11% from other fees and income.</p> <p>Retailers have discretion in whether to make the CRF visible to consumers or incorporate it into the product price.</p>
<b>Management and allocation of program funds</b>	Costs for 2010 were <sup>24</sup> CAD 86 million (~\$87.5 million) – comprising 60% handling fees, 31% deposit payments, 5% administration, 5% consumer awareness. Encorp Pacific fee for service payments to depots amount to \$51.3 million/year (~\$52.2 million) <sup>25</sup> .
<b>Collection types and coverage</b> <sup>26</sup>	<p>Encorp Pacific contract out all collection and logistics to third parties and credit this approach for their ability to scale up to handle new materials as needed and achieve economies of scale from that expansion. ~700 full-time equivalents are employed by depots.</p> <p>As of 2010, Encorp Pacific had collected and recycled over 10 billion used beverage containers, and now recycles over 1 billion used beverage containers p.a. (around 241 per capita p.a.). These containers are collected through a network of 171 independently owned and operated depots, all of which are under contract to Encorp Pacific for collecting the containers. Not all of the depots are under contract to collect milk containers and e-waste; around 157 depots collect milk containers at least 74 collect e-waste items.</p> <p>Depots are responsible for 90% of all collected containers (10% go to retailers). Depots are also responsible for 84% of all collected alcohol containers (16% go to government-owned liquor stores). In consumer surveys, 70% of consumers surveyed feel the nearest bottle depot is close to their home (22% very close and 48% somewhat close).</p>



<b>Quantitative impacts on recycling and litter</b>	<p>In 2010, Encorp Pacific had a recycling rate of 80.4% across all beverage containers, consisting of the following recycling rates<sup>27</sup>:</p> <ul style="list-style-type: none"> <li>• 83.5% for aluminium cans;</li> <li>• 78.3% for plastic containers;</li> <li>• 93.3% for glass containers;</li> <li>• 65.9% for bi-metal cans;</li> <li>• 60.0% for polycoat containers; and</li> <li>• 44.4% for alcohol bag-in-boxes.</li> </ul> <p>Quantitative data on impacts of the program on litter is not readily available. Encorp Pacific report minimal beverage container, so litter quantities are not studied<sup>28</sup>.</p>
<b>Authorising legislation</b>	<p>Legislation authorises the product stewardship framework within which Encorp Pacific provides collection and recovery services for affected industries. The CDS legislation for beverage containers dates back to the <i>Litter Act 1970</i>, which was replaced by the <i>Beverage Container Stewardship Program Regulation 406/97</i>, in turn replaced by the October 2004 <i>Recycling Regulation</i>.</p>

Figure 2 shows British Columbia's CDS program, with Encorp Pacific as the industry consortium responsible for central program management. Due to varying deposit and CRF values by container size and material type, Figure 2 is indicative only.



**Figure 2: Encorp Pacific's Role in British Columbia's CDS Program**

Encorp Pacific's operating principles<sup>29</sup> are:

- "To develop and operate a system which provides consumer-friendly and cost-effective service throughout the province
- To manage the system efficiently so as to have the lowest impact on consumer shelf prices
- To run a cost-based system in which each product type pays its own expenses with no cross-subsidization from other products or companies
- To divert used products from landfill and incineration
- To maximize the value of the recovered commodities
- To treat all brand owners equitably"



Encorp Pacific's principle of avoiding material cross-subsidisation helps to maintain the internal integrity of each of their collection schemes while also ensuring transparency and accountability within those schemes.

## Denmark

Denmark's CDS was developed in response to anticipated repeal of a controversial 'can ban' that took effect in 1977 for carbonated soft drinks and in 1981 for beer. From these dates until 2002, beer and carbonated soft drinks sold in Denmark were required by law to be marketed in refillable packaging only. Drink producers and retailers anticipated that mandatory deposits on non-refillable containers would accompany repeal of the can bans and developed the Danish CDS to help discharge their obligations. This situation explains why Denmark is the only country in Europe where refillables and non-refillables are handled by the same CDS. When the system was established, only refillables were on the market. Thus the system was strongly focused on refillables initially, but has had to adapt in response to the strong market growth of non-refillables.

Beverage containers covered in the CDS pay a volume-based packaging tax charged at significantly lower rates than the weight-based tax charged on some other drinks containers.

Denmark is unique in the European Union in not having introduced product stewardship arrangements for non-beverage packaging. Producers pay taxes on selected pack types and specific products. However there is no producer-funded program for non-beverage packaging waste, which is still managed and funded by local government.

Key features of Denmark's CDS program are provided in Table 5.

**Table 5: Key Features of Denmark's CDS program**

<b>Operation and management</b>	Legislation in 2002 provided for Dansk Retursystem A/S (DRS, a private non-profit organisation) to be granted an exclusive licence to operate the deposit system and to levy fees on beverage producers and importers. The system also funded a six-year program of investment in collection facilities for stores selling beverages. A subsequent order has given DRS a new licence to operate the system until 1 January 2017. The legislation contains detailed requirements for operating the system, so any operational changes require a legislative amendment.
<b>First Implemented</b>	Drink producers established DRS in July 2000, in anticipation that mandatory deposits would be introduced as part of repealing the controversial can ban. The mandatory deposit system took effect in 2002.
<b>Packaging material or container types included</b>	A unified CDS applies across all refillable and non-refillable glass, metal and plastic packaging of beverages sold on the Danish market, except beverage cartons and the large plastic containers used with water dispensers. Initially the deposit applied only to beer and carbonates, but in April 2005 the scope was extended to 'alcopops' (including mixed drinks based on spirits, wine and beer) and cider with an ethanol content of less than 10%. In 2008 the CDS was expanded further to still drinks such as iced tea and flavoured mineral waters. However, wine and spirits bottles are not required to participate in the CDS because they are not considered to contribute to the litter problem.
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Deposit amounts</b> are set by law and vary by container type and size. For non-refillables since February 2004, they are:</p> <ul style="list-style-type: none"> <li>Type A - Cans, glass and plastic bottles less than 1 litre - DKK 1.00 (~\$0.19)</li> <li>Type B - 500 ml plastic bottles - DKK 1.50 (~\$0.28)</li> <li>Type C - Cans, glass and plastic bottles of 1 litre or more - DKK 3.00 (~\$0.56)</li> </ul>

	<p><b>Funding source and liability point:</b> Importers, suppliers/distributors and producers must pay the deposit and fees to DRS. They pay an annual fee plus fees per unit of packaging sold. Importers and producers of non-refillable containers pay a logistics fee and a collection fee to DRS that varies by material and volume and covers administrative overheads and efficiency improvements in grocery stores. Logistics fees, which are paid both for refillables and non-refillables, are therefore only paid for sales to the grocery trade. The collection fee, which varies by volume and material, covers the cost of collecting the packaging.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> Relevant data is reported to an independent accounting firm which sends summary reports to DRS. This arrangement was devised because of fears that the dominant drinks producer, Carlsberg, could have access to sales data of its competitors. Deposit-bearing containers are labelled for consumers, either directly on the container or through a self-adhesive deposit label. DRS publishes a detailed annual report.</p> <p>A study commissioned in 2006 by the Danish Environment Ministry found that the Danish CDS costs DKK 0.55 (~\$0.10) per packaging container. If unredeemed deposits were included, the cost was DKK 0.382 (~\$0.07).</p>																		
<b>Management and allocation of program funds</b>	<p>DRS is owned by various drinks producers and associations. In DRS's first licence term, DRS paid investment subsidies to retailers to improve the efficiency of their return systems for non-refillable containers. The 2008 licence provided for a reduced investment program. DRS also pays handling fees to retailers for each container redeemed. However, between 2002 and 2008 such fees were paid only for refillables, so retailers were not paid for handling non-refillables. Retailers that have received investment subsidies receive handling fees at lower rates. Fees for non-refillables are also higher for stores that do not have compacting RVMs and highest for stores that handle containers manually.</p> <p>DRS acts as a clearing house for deposits, so it keeps unredeemed deposits. DRS's licence gives it flexibility in how it uses unredeemed deposits. This flexibility was expanded in 2008, as some revenue is spent on community projects unrelated to packaging issues. Some unredeemed deposits are used to cover the expense of collecting non-deposit-bearing containers through DRS. These are significant because of cross-border sales in Germany, where drinks are cheaper, and permission has been granted not to charge the high German deposit on sales to Scandinavians. Unredeemed deposit are also used to:</p> <ul style="list-style-type: none"><li>• invest in technical improvements to collection and data management in stores;</li><li>• fund information campaigns; and</li><li>• support Denmark's anti-litter organisation, <i>Hold Danmark Rent</i>.</li></ul> <p>Reported unredeemed deposits are:</p> <table><tr><td></td><td><b>2004</b></td><td><b>2005</b></td><td><b>2006</b></td><td><b>2007</b></td><td><b>2008</b></td></tr><tr><td>Unredeemed deposits (million DKK)</td><td>42.7</td><td>61.5</td><td>87.5</td><td>61.5</td><td>65.0</td></tr><tr><td>Unredeemed deposits (million \$)</td><td>8.0</td><td>11.5</td><td>16.3</td><td>11.5</td><td>12.1</td></tr></table>		<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	Unredeemed deposits (million DKK)	42.7	61.5	87.5	61.5	65.0	Unredeemed deposits (million \$)	8.0	11.5	16.3	11.5	12.1
	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>														
Unredeemed deposits (million DKK)	42.7	61.5	87.5	61.5	65.0														
Unredeemed deposits (million \$)	8.0	11.5	16.3	11.5	12.1														
<b>Collection types and coverage</b>	<p>The Danish system focuses on the use of RVMs at retail. 2,000 RVMs were to be available in the larger retail outlets from 23 September 2002, when deposit-bearing cans and non-refillable plastic bottles became eligible for return. Some manual sorting occurs in small retail outlets. Stores with an RVM must handle deposit refunds manually if their RVM is out of service.</p> <p>Stores with RVMs must accept all types of one-way packaging with the Danish deposit label, while stores without RVMs that sell drinks must accept the types of packaging materials sold in the store.</p> <p>To be eligible for a refund, the packaging must be marked with the deposit label, an EAN barcode number and a two-digit code allocated by DRS. All sales locations selling deposit-bearing beverages must take the empty packaging back and pay a refund, but there is no obligation to register with DRS. However, they must register with DRS and pay the relevant registration fee in order to receive handling fees from DRS.</p>																		

Quantitative impacts on recycling and litter	A return rate target of 95% by October 2004 for one-way packaging was prescribed in the 2002 legislation. However, the target has been postponed several times and currently stands at 1 January 2013 under Order No. 326/2008.						
	Return rates for non-refillable beverage containers are as follows:						
		2003	2004	2005	2006	2007	2008
	Metal	81%	79%	83%	84%	84%	84%
	Plastic	n/a	69%	88%	88%	93%	93%
	Glass	90%	86%	83%	87%	91%	93%
	Total	n/a	80%	84%	86%	87%	88%
The return rates are calculated for the whole country. DRS estimates that collection rates are higher in urban areas than in rural areas.							
Quantitative data on impacts of the program on litter is not readily available.							
Authorising legislation	Order No 713 of 24 August 2002 introduced new CDS provisions. As amended it requires all parties selling drinks to the retail and commercial sales outlets to charge a deposit. The original legislation set out the detailed operating arrangements for DRS, so it has been amended several times.						

Cross-border redemption issues with Germany remain an ongoing source of dispute. Danish retailers have been lobbying their government to ensure that Danish consumers pay the German deposit, as buying cans at German prices but without the EUR 0.25 (~\$0.36) German deposit makes them very attractive to Danish consumers. In February 2009 the Danish Environment Minister stated that approximately 400 million cans were imported from Germany each year. In February 2010, a major Danish distributor claimed that imports of canned beer and soft drinks from Germany amounted to 700-800 million units per year.

In the first 6-year licence period for DRS, registered stores could apply for an investment subsidy to improve the efficiency of their return systems for non-refillable containers. The investment subsidy was capped at DKK 60,000 (~\$11,171) for stores taking back at least 50,000 non-refillable containers per year and DKK 40,000 (~\$7,447) for those accepting between 35,000 and 50,000. A total of DKK 232.7 million (~\$43.3 million) was paid under an investment subsidy from system establishment in 2002 to 2006, after which no subsidies have been paid.

## Sweden

When beverage cans and then PET beverage bottles first came on the market, Sweden adopted rules that in practice required aluminium beverage cans and non-refillable PET to participate in a deposit system. From January 2006, Sweden's CDS was extended to all metal cans and all plastic bottles, with limited exceptions for certain beverage types. Producers and importers selling all eligible beverages in these containers must charge a deposit and participate in an approved deposit system. Non-deposit beverage packaging is handled together with other packaging through a Green Dot System, FTIAB. FTIAB does not handle glass, which is handled through a separate producer-run system, SGÅ.

Key features of Sweden's CDS program are provided in Table 6.

**Table 6: Key Features of Sweden's CDS program**

<b>Operation and management</b>	Sweden’s initial law in 1982 for aluminium cans left details for the administration of the CDS up to breweries, importers and retailers, as did requirements for PET in 1991. As of January 2006, all producers and importers of beverage products in eligible containers are required to register with an approved deposit scheme. The new legislation also established basic operating criteria and required systems to be approved. AB Svenska Returpack (Returpack) is the largest and longest-established deposit system, but a few small systems have been approved since the regulations were amended. The long-established deposit system for refillable glass (and some refillable PET, although this is in sharp decline) operated by the brewers also continues to operate, on a voluntary basis. Retailers do not have a legal obligation to accept containers or refund the deposit.																									
<b>First Implemented</b>	The current Swedish CDS was first introduced in 1984 for aluminium cans.																									
<b>Packaging material or container types included</b>	As of January 2006, all plastic and metal beverage containers for ready-to-drink beverages are included, with the exceptions of drinks containing 50% or more of dairy products or juice (whether fruit or vegetable). The exceptions were mainly for hygiene reasons due to bacteria growth and the nuisance of smell, as well as for competition reasons. Inclusion of these drinks would have encouraged a switch to cartons, excluded from the deposit obligations, and would give a competitive advantage to large producers that already used that pack format.																									
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Deposit amount:</b> Set by Returpack in consultation with the authorities, and varies by material and volume. The deposits are:</p> <ul style="list-style-type: none"><li>• <b>Cans:</b> SEK 0.50 (~\$0.08);</li><li>• <b>PET bottles of 1 litre or less:</b> SEK 1.00 (~\$0.16); and</li><li>• <b>PET bottles larger than 1 litre:</b> SEK 2.00 (~\$0.31).</li></ul> <p><b>Funding source and liability point:</b> Producers and importers of beverage products in eligible containers pay an annual SEK 10,000 (~\$1,570) registration fee to the deposit system, which passes it to the Swedish Board of Agriculture (Jordbruksverket) to fund auditing and enforcement of the scheme.</p> <p>Producers, importers/distributors and producers pay the deposit in advance to Returpack, as well as a fee for each EAN code registered.</p> <p>For aluminium cans, Swedish fillers and importers pay the deposit net of VAT, SEK 0.45 (~\$0.07). Handling fees are not paid, as operating costs are covered by the scrap value of the aluminium and because of significant personal exports, in particular to Norway.</p> <p>For steel cans, Swedish fillers and importers pay the net deposit of SEK 0.45 (~\$0.07) plus a handling fee of SEK 0.25 (~\$0.04) per can to cover additional sorting costs (steel has a lower scrap value than aluminium).</p> <p>For PET, fillers or importers pay the deposit net of VAT plus a handling fee per bottle:</p> <table><tr><td></td><td colspan="2">PET 1 litre or less, per unit</td><td colspan="2">PET &gt;1 litre, per unit</td></tr><tr><td></td><td>SEK</td><td>\$</td><td>SEK</td><td>\$</td></tr><tr><td>Deposit net of VAT</td><td>0.89</td><td>~\$0.14</td><td>1.79</td><td>~\$0.28</td></tr><tr><td>Handling fee</td><td>0.22</td><td>~\$0.03</td><td>0.52</td><td>~\$0.08</td></tr><tr><td>Total</td><td>1.11</td><td>~\$0.17</td><td>2.31</td><td>~\$0.36</td></tr></table> <p>An additional sorting fee is payable on coloured PET bottles of SEK 0.05 (~\$0.01) per bottle, regardless of size.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> Deposit-bearing containers are labelled for consumers, either directly on the container or through a self-adhesive deposit label. Returpack does not publish an annual report.</p>		PET 1 litre or less, per unit		PET >1 litre, per unit			SEK	\$	SEK	\$	Deposit net of VAT	0.89	~\$0.14	1.79	~\$0.28	Handling fee	0.22	~\$0.03	0.52	~\$0.08	Total	1.11	~\$0.17	2.31	~\$0.36
	PET 1 litre or less, per unit		PET >1 litre, per unit																							
	SEK	\$	SEK	\$																						
Deposit net of VAT	0.89	~\$0.14	1.79	~\$0.28																						
Handling fee	0.22	~\$0.03	0.52	~\$0.08																						
Total	1.11	~\$0.17	2.31	~\$0.36																						

Management and allocation of program funds	Returpack is owned 50% by the Swedish Brewers Associaton and 25% each by two grocery distribution associations (SSLF and Svensk Daglig Varuhandel).														
	In addition to refunding the deposit, Returpack pays a handling fee to retailers per returned container. Retailers with RVMs receive a higher fee than those with manual handling. Retailers must register with Returpack to receive handling fees, but registration is free. Current fees are:														
	Handling fees	PET 1 litre or less, per unit		PET >1 litre, per unit		Cans, per unit									
		SEK	\$	SEK	\$	SEK	\$								
		Received by retailers with RVMs	0.50	~\$0.08	0.60	~\$0.09	0.15	~\$0.02							
Received by retailers without RVMs	0.20	~\$0.03	0.20	~\$0.03	0.00	\$0.00									
	Returpack does not publish financial information. However personal purchase of deposit drinks (particularly canned beer) by Norwegians is significant (Resirk reported that it handled 11 million Swedish cans in 2008). The level of unredeemed deposit retained by Returpack can therefore be assumed to be significant.														
Collection types and coverage	<p>The Swedish system focuses on the use of RVMs at retail, with specific RVMs for cans, PET bottles and combi-RVMs taking cans, plastic and glass bottles. Combi-RVMs are generally only seen in larger stores as they are significantly more expensive (~ €50,000 or \$71,140 in 2008) than single item RVMs (~ €5,000 or \$7,114 in 2008)<sup>30</sup>. 15,000 return points are registered with Returpack.</p> <p>Some manual sorting occurs in small retail outlets.</p> <p>To be eligible for a refund, the packaging must be marked with the deposit label and the EAN barcode number must be registered with the deposit system.</p> <p>Unlike some other national CDS schemes, the Swedish CDS does not operate a special ink to avoid fraud in RVMs, relying only on barcode and container shape recognition. Reported fraud includes imported PET bottles being labelled with barcodes for the SEK 2.00 deposit although the bottles were only eligible for a SEK 1.00 deposit<sup>31</sup>.</p>														
Quantitative impacts on recycling and litter	<p>Material recycling rate targets were established when requirements were first adopted. They were retained at the same rates in 2005 and in a follow-up 2006 ordinance, which said that they must be met by end-2008.</p> <table><tr><td></td><td>Material recycling target</td></tr><tr><td>Metal beverage containers</td><td>90%</td></tr><tr><td>Plastic beverage containers</td><td>90%</td></tr><tr><td>Glass packaging (not specifically for deposit bottles)</td><td>70%</td></tr></table> <p>Beverage cans achieved a recycling rate of 87% in 2007, while non-refillable PET drinks bottles achieved a recycling rate of 98%. Therefore, only PET met its recycling target. However, it should be noted that the 21,000 tonnes recycled for PET included some 3,000 tonnes of refillable bottles withdrawn from circulation; these accounted for around 14% of the 98% recycling rate.</p> <p>The return rates are calculated for the whole country. Contrary to Denmark’s reported results, Returpack estimates that collection rates are lower in urban areas than in rural areas. The average urban redeemer returned 114 containers annually compared to the national average of 135; Returpack cited laziness of the consumer in urban areas<sup>32</sup>.</p> <p>Deposit system applications for approval must specify what anti-litter measures they plan to take, however quantitative data on impacts of the program on litter is not readily available.</p>								Material recycling target	Metal beverage containers	90%	Plastic beverage containers	90%	Glass packaging (not specifically for deposit bottles)	70%
	Material recycling target														
Metal beverage containers	90%														
Plastic beverage containers	90%														
Glass packaging (not specifically for deposit bottles)	70%														

<b>Authorising legislation</b>	<p>The <i>Law on Recycling of Beverage Packaging of Aluminium</i>, No. 349 of 1982, established the CDS for aluminium cans. The <i>Law on Certain Beverage Packaging</i>, No. 336 of 1991, added PET bottles to the scheme.</p> <p>The Swedish CDS is now regulated by the 2005 <i>Ordinance on Deposit Scheme for Plastic Bottles and Metal Cans</i>, which added steel cans and all types of plastic from 1 January 2006, required all producers and importers of beverage products in eligible containers to register with an approved deposit scheme and specified labelling about the deposit scheme and deposit amount.</p>
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## ADVANCE DISPOSAL FEES

ADFs are intended to influence producer choices toward particular policy objectives and/or to provide a source of revenue for end-of-life management of the products or for other environmental projects. Consumers may or may not be aware that they are paying the fee in the product price.

Under ADFs, producers pay an amount per item sold that is intended to cover future end-of-life disposal or recycling costs of the product. ADFs are considered to be extended producer responsibility (EPR) if there is a significant shift of financial or physical responsibility to the producer<sup>33</sup>.

Products subject to ADFs range from beverage containers to tyres and lead acid batteries. Australian examples of ADFs include programs for used agricultural and veterinary chemical containers, mobile phones, newsprint, used oil and used refrigerants.

### Florida ADF

In 1988, the US state of Florida legislated an ADF with a delayed implementation date to provide incentive for industry to develop markets for materials recovered under the state's fledgling kerbside recycling program. The original ADF contained CDS deposit-refund provisions.

A review of the ADF prior to its taking effect raised significant concerns about conflicts between the ADF and kerbside recycling. Florida was also concerned that CDS would simply increase supply of, rather than demand for, recovered materials. Litter management was being addressed through parallel strengthening and funding of Keep Florida Beautiful, so it was not necessary to address litter in the ADF.

Florida subsequently repealed the CDS aspect of the ADF and designed it to stimulate demand for recovered materials. The ADF was US \$0.01 (~\$0.01) or US \$0.02 (~\$0.02) per can, bottle jar or beverage container within a given size range. The market incentives of the ADF included exemptions for achieving specified recycling and recovery targets designed to be achievable but ramp up over time<sup>34</sup>:

- 50% material recycling rate exemption (aluminium and steel cans were never subject to the ADF due to recovery rates greater than 50%).
- Recycled content exemptions:
  - 25% for plastic;
  - 30% for paper; and
  - 35% for glass.



- Tradable recycling credits exemption (producers could gain exemption by documenting they had caused recycling in Florida at least equivalent to the amount of material required under the recycled content exemptions).

Brand owners and industry associations could petition in advance for exemption from the ADF and demonstrate compliance with the exemptions after the end of the exemption period, with strong financial penalties for non-compliance.

Key features of Florida's ADF program are provided in Table 7.

**Table 7: Key Features of Florida's ADF Program<sup>35</sup>**

<b>Operation and management</b>	The Florida Department of Environmental Protection was responsible for program development and oversight, as well as calculation of sustained recycling rates for each container material type and support of the Florida Packaging Council, established to ensure that the recycled material content goals were technically sound and achievable through a diligent effort by manufacturers. Fee collections were under the purview of the Florida Department of Revenue (FDOR), consistent with state sales tax collections.
<b>First Implemented</b>	First established in October 1993. A sunset clause in the amended legislation took effect October 1995.
<b>Packaging material or container types included</b>	Individual, separate, and sealed glass, plastic, plastic-coated paper, steel, aluminium, or other metal can, bottle, jar or beverage container, including cans, bottles, jars, or beverage containers composed of more than one material, from five ounces (~148mL) to one gallon (~4.4L) and in which the contents have been sealed by the manufacturer. Containers for medical devices, drugs, medicine, or other medical items were specifically exempted. Contents of the containers were not distinguished further in order to avoid distinctions between container types and beverage types that were viewed as arbitrary.
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Fee amount:</b> US \$0.01 (~\$0.01) or US \$0.02 (~\$0.02) per can, bottle jar or beverage container within a given size range.</p> <p><b>Funding source and liability point:</b> Collected by distributors from retailers and reported to FDOR consistent with state sales tax collections and point of first entry onto the Florida market.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> During legislative development, planned consumer notification provisions were weakened by retailers. Although most supermarkets indicated the ADF as a separate line item, other retailers tended not to and consumers were therefore generally not aware they were paying the ADF on a range of items. The primary incentives for producers to seek exemption came from supply chain influences.</p> <p>As the ADF relied upon market forces, only the fee amount was specified in legislation. Handling fees, if used, were contractual commercial arrangements and not monitored by the state. Comprehensive cost / collection data is not available for participants.</p>
<b>Management and allocation of program funds</b>	<p>In two years, ADF raised over US \$64 million (~\$62.5 million) for various environmental programs, including small county landfill closure, stormwater and sewage treatment loans, small community sewer construction, and recycling market development. Over US \$6 million (~\$5.9 million) was dedicated to recycling market development.</p> <p>Since 1989, Florida had been providing roughly US \$25 million (~\$24.4 million) per annum for recycling and recycling education, so less funding was required for recycling programs. Ongoing funding requirements from the ADF were deliberately avoided, as the intent was for funding to dry up as recycling and recycling markets strengthened.</p>
<b>Collection types and coverage</b>	The ADF was intended to compliment Florida's existing kerbside recycling program. No separate depots, RVMs or drop-off centres were established.



<b>Quantitative impacts on recycling and litter</b>	<p>In a survey of ADF petitioners, 61.5% of take back petitioners stated that as a direct result of the ADF, they initiated recycling efforts that they otherwise would not have initiated, and 25.9% of recycled content petitioners stated that as a direct result of the ADF, they initiated recycling efforts that they otherwise would not have initiated. Two new recycling facilities were located in Florida for glass and plastic to address the increased demand. According to the Bottlemaking Technology and Market News, 'On the day that Florida's ADF was dropped, demand for food contact recycled content vanished overnight'.</p> <p>Quantitative data on impacts of the program on litter is not readily available, as litter was not a specific program objective.</p>
<b>Authorising legislation</b>	Chapter 403.7197, Florida Statutes

The Florida ADF was not intended as an ongoing revenue source; it was intended to provide appropriate incentives for recycling to producers and the broader supply chain. Figure 3 shows the impacts of the exemptions on revenue raised under the Florida ADF. The top line indicates revenue that would have been generated were it not for the exemptions, while the bottom area indicates actual revenue. Whilst most ADFs require that revenues be used to address the material or product to which the levy applies, this was not necessary in Florida due to funding for recycling programs from other sources.

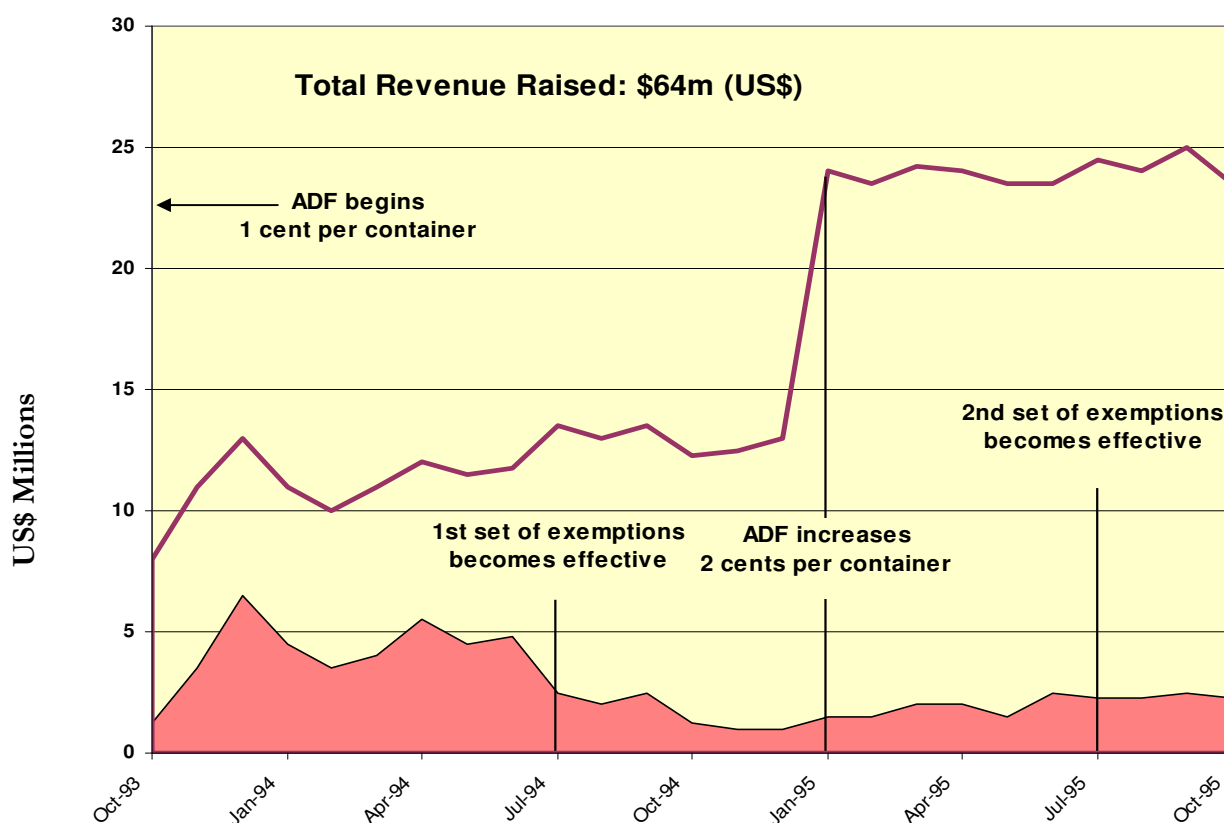


Figure 3: Impacts of Exemptions on Revenue from Florida ADF

## Swiss ADF on Glass

In 1990, Switzerland adopted a Beverage Containers Ordinance aimed at eliminating PVC containers and ensuring that replacement of refillables with non-refillable beverage containers did not increase pressure on disposal facilities. The Ordinance specified the maximum tonnage of non-refillable beverage containers which could enter the waste stream. The mandatory deposits that applied to refillable bottles would be applied to non-refillables at the same rates if the waste reduction targets were missed<sup>36</sup>; these deposits were eventually made discretionary.

Some cantons<sup>37</sup> wanted the Ordinance to set recycling targets instead of disposal limits fixed in tonnes so that targets would be proportional to the amount of packaging placed on the market (the tonnage limits were absolute). The EU was also unhappy with the Swiss ban on PVC containers, which excluded drinks made by the dwindling but still significant number of manufacturers using PVC.

The 2000 Beverage Containers Ordinance subsequently imposed mandatory deposits on non-refillable PVC as well as on all refillable containers. More significantly, the Ordinance stated that deposits may be imposed on glass, PET or aluminium beverage containers if a material-specific 75% recycling target was not met. While producers can meet the PET and aluminium targets individually or through a collective system, glass beverage containers became subject to an ADF of between CHF 0.02 (A\$0.02) and CHF 0.06 (A\$0.07), depending on bottle size. Too many glass users had been unwilling to take part in a voluntary system, so the ADF was introduced instead to eliminate any free-riding.

Key features of Switzerland's ADF on glass are provided in Table 8.

**Table 8: Key Features of Switzerland's ADF on Glass**

<b>Operation and management</b>	A private organisation manages the funds to support the collection, transport, sorting and preparation of these containers for recycling, and for consumer information. VetroSwiss was set up to administer the system under a five-year contract with the environment authority. This contract was renewed to 2011 and is believed to have been extended in 2011 based on a subsequent competitive tender. Only 5 staff work for Vetroswiss; collections are contracted out and municipalities are paid based on recovery.												
<b>First Implemented</b>	ADF collections took effect in 2001, with the industry collection system taking effect 1 January 2002.												
<b>Packaging material or container types included</b>	Glass beverage containers with a capacity equal to or greater than 0.09 litres. Glass packaging for food is specifically exempt.												
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Fee amount:</b> A 2002 regulation introducing the Swiss glass ADF established the rates shown below. The Department for Environment, Transport, Energy and Communication (UVEK/ DETEC) sets the level of the fee according to the costs of collection and sorting, so the regulation would need to be changed in order to change the ADF amount.</p> <table><thead><tr><th><b>Bottle capacity</b></th><th><b>CHF</b></th><th><b>\$</b></th></tr></thead><tbody><tr><td>0.09 – 0.33 litre</td><td>0.02</td><td>0.02</td></tr><tr><td>0.34 – 0.60 litre</td><td>0.04</td><td>0.05</td></tr><tr><td>&gt; 0.60 litre</td><td>0.06</td><td>0.07</td></tr></tbody></table> <p>Average fee amount is CHF 0.038 (\$0.05).</p> <p><b>Funding source and liability point:</b> The ADF is payable through Customs declarations by all suppliers of empty glass beverage bottles for use in Switzerland, and importers of empty or filled glass beverage bottles, unless they are below the <i>de minimis</i> threshold (supplying or importing fewer than 1,000 beverage containers per half calendar year).</p>	<b>Bottle capacity</b>	<b>CHF</b>	<b>\$</b>	0.09 – 0.33 litre	0.02	0.02	0.34 – 0.60 litre	0.04	0.05	> 0.60 litre	0.06	0.07
<b>Bottle capacity</b>	<b>CHF</b>	<b>\$</b>											
0.09 – 0.33 litre	0.02	0.02											
0.34 – 0.60 litre	0.04	0.05											
> 0.60 litre	0.06	0.07											

	<b>Transparency of financial flows and visibility to consumers:</b> ADF revenues in 2009 were CHF 30.3 million (\$35.9 million), with costs comprising 92.5% reimbursement for used glass to municipalities (see below), 4.5% publicity / consumer awareness and 3% administration.
<b>Management and allocation of program funds</b>	VetroSwiss is responsible for managing program funds, subject to government competitive tendering for the management services.
<b>Collection types and coverage</b>	Approximately 4,000 drop-off centres participate in the system. <sup>38</sup>
<b>Quantitative impacts on recycling and litter</b>	Glass recycling has always exceeded the 75% target set by the 2000 Ordinance. The 2009 recycling rate for all glass containers (not just beverage containers) was 95%. In 2009, 331,507 tonnes of glass were collected (42 kg per capita). <sup>39</sup> Quantitative data on impacts of the program on litter is not readily available.
<b>Authorising legislation</b>	Beverage Containers Ordinance adopted in 2000, with the implementing regulation adopted in 2002.



**Figure 4: One of Vetroswiss's Preferred 7 Tonne Glass Bins in Bachenbülach, Switzerland**

Vetroswiss pays local governments, not private collectors, on a per tonne basis depending on the form of the glass recovered (Table 9). Approximately 1,500 of the 2,600 Swiss municipalities receive these payments.

**Table 9: Vetroswiss Payments to Municipalities<sup>40</sup>**

Type of glass collection	Type of recovery (evidence of recovery required)	Reimbursement (approx.) per tonne
Whole bottles	As drink bottles	CHF100 (~\$118.62)
Cullet, colour-segregated collection	Production of new glass (all three colour fractions)	CHF100 (~\$118.62)
	white and brown cullet for the production of new glass (Recovery of the green fraction as other environmentally useful products)	CHF100 (~\$118.62)
Cullet, mixed colour collection	Production of new green glass or of environmentally useful products	CHF 60 (~\$71.17)
	Other forms of recovery (e.g. sand substitute)	CHF 20 (~\$23.72)

## INDUSTRY-DRIVEN PRODUCER RESPONSIBILITY SCHEMES

Industry-driven producer responsibility schemes, often called producer responsibility organisations (PROs), are designated in Australia's new product stewardship legislation as product stewardship organisations (PSOs).

Packaging was the first sector to be covered by producer responsibility rules in Europe, beginning with Italy's Law no. 475 of November 1988 which required separate collection of containers for liquids from 1990. Packaging manufacturers and importers had to join material-specific "consortia" set up to collaborate with local authorities on recycling collections. Consortium members had to contribute a levy to cover the consortium's operating costs. The German Packaging Ordinance of June 1991 took a similar approach – producer responsibility, collective funding of recycling by industry and material-specific targets – but covered all packaging, and its impact extended far beyond Germany.<sup>41</sup>

Some neighbouring countries decided that the best means of defence against market distortions resulting from the German Packaging Ordinance was to adopt legislation setting their own national targets to ensure that local packaging waste was still collected and that local reproprocessors were not driven out of business by subsidised German competitors. As a result, in December 1994 the EU adopted a Directive on Packaging and Packaging Waste to restore some order by ensuring that all member states took steps to ensure that recycling systems were set up and developed. Each member state was required to transpose the Directive's provisions into national law by July 1996. Only Denmark, the Netherlands and the UK chose to deviate fundamentally from the original German model. However, differences in the detailed design have resulted in major differences in the outcomes and in the resulting PROs.<sup>42</sup>

Duales System Deutschland (DSD) was the consortium originally responsible for recovering sales packaging in Germany. The on-pack Green Dot symbol, a trademark of DSD, the only dual system then operating, was an effective enforcement tool to address free-riders on the system. Use of the Green Dot was meant to indicate that the pack concerned was participating in the DSD financing system for sales packaging, and DSD



vigorously pursued companies which infringed its trademark by displaying the Green Dot symbol when they had not paid for the right to use it. The Green Dot and its approach were ultimately licensed to 33 countries<sup>43</sup>.

### *Fost Plus Belgian Green Dot Scheme*

Fost Plus uses the Green Dot scheme to assist the Belgian packaging supply chain in discharging its obligations resulting from Belgium's transposition of the EC Directive on Packaging and Packaging Waste. Fost Plus focuses on household packaging and until at least 2013 is the sole organisation responsible for household packaging recovery, although some commercial packaging is also collected.

Key features of Fost Plus are provided in Table 10.

**Table 10: Key Features of Fost Plus**

Operation and management	Fost Plus is a private, non-profit organisation responsible for the promotion, coordination and funding of the collection, sorting and recycling of household packaging waste in Belgium. Fost Plus acts on behalf of its members to help deliver requirements under the EC Directive on Packaging and Packaging Waste and has adopted the Green Dot packaging licensing and compliance scheme.																														
First Implemented	First established in 1994.																														
Packaging material or container types included	Plastic bottles, flasks, drink cartons, paper, carton board, glass.																														
Financial flows, funding source, liability point and transparency	<p><b>Fee amount:</b> Green Dot licencing fees for Fost Plus in 2010 were<sup>44</sup>:</p> <table><thead><tr><th>Material Type</th><th>EURO / Tonne</th><th>\$</th></tr></thead><tbody><tr><td>Glass</td><td>18.4</td><td>\$26.18</td></tr><tr><td>Paper-cardboard</td><td>17.6</td><td>\$25.04</td></tr><tr><td>Steel</td><td>37.6</td><td>\$53.50</td></tr><tr><td>Aluminium</td><td>137.9</td><td>\$196.21</td></tr><tr><td>PET</td><td>199.4</td><td>\$283.72</td></tr><tr><td>HDPE</td><td>199.4</td><td>\$283.72</td></tr><tr><td>Drinks cartons</td><td>272.8</td><td>\$388.16</td></tr><tr><td>Others – Recoverable</td><td>313.5</td><td>\$446.07</td></tr><tr><td>Others – Non-recoverable</td><td>441.7</td><td>\$628.49</td></tr></tbody></table> <p><b>Funding source and liability point:</b> Packaging supply chain members (producers, private label retailers, importers) are responsible for annually meeting the recycling and recovery targets of the EC Directive fund Fost Plus to discharge their collection and recycling obligations on their behalf.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> Fee amounts are incorporated into product prices and not separately visible to consumers. High-level financial reporting is provided in public annual reports.</p> <p>Fost Plus contends it “is ‘high- performing and low-cost’ precisely because it must answer to stakeholders who fund the system including industry and citizens”<sup>45</sup>.</p>	Material Type	EURO / Tonne	\$	Glass	18.4	\$26.18	Paper-cardboard	17.6	\$25.04	Steel	37.6	\$53.50	Aluminium	137.9	\$196.21	PET	199.4	\$283.72	HDPE	199.4	\$283.72	Drinks cartons	272.8	\$388.16	Others – Recoverable	313.5	\$446.07	Others – Non-recoverable	441.7	\$628.49
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Management and allocation of program funds	Financial data for Fost Plus is not reported in a format that would allow comparison to that of other programs examined in this report.																														



<b>Collection types and coverage</b>	<p>In Belgium, consumers are encouraged to sort their packaging waste by purchasing colour-coded bags, upon which higher fee are charged for non-recyclable waste. This provides incentive for Belgians to put their packaging waste in the designated recycling bags. Kerbside ‘blue bag’ collection is for plastic bottles and flasks, metals and drinks cartons, while public container parks, also known as recycling centres, have been established for people to recycle these items away from home. Other collection facilities are also available for paper and carton board and for glass packaging, which goes directly to recyclers.</p> <p>The use of transparent blue bags enable kerbside collectors to monitor the recovered materials. Bags containing incorrect materials are marked and left behind.</p>
<b>Quantitative impacts on recycling and litter</b>	<p>Fost Plus’s objectives are set by the Cooperation Agreement between the three regions involved, which stipulates a recycling rate of at least 80% and a recovery rate of at least 90%.</p> <p>For 2010, Fost Plus report a 94.9% recovery rate and 91.5% recycling rate, with over 755,000 tonnes of packaging recycled. As a Green Dot organisation, Fost Plus reports recycling against the amount of packaging its members put on the market in Belgium, not necessarily the total amount of packaging entering the market. The overall packaging recycling rate was 84.5% in 2010 based on estimated household packaging put on the Belgian market, consisting of the following:</p> <ul style="list-style-type: none"> <li>• 83,478 tonnes recycled, 97.6% % recycling rate for metals;</li> <li>• 62,706 tonnes recycled, 70.7% % recycling rate for plastic bottles and flasks;</li> <li>• 334,935 tonnes recycled, 105.4% recycling rate for glass containers; and</li> <li>• 15,533 tonnes recycled, 81.4% recycling rate for beverage cartons.</li> </ul> <p>The reported glass recycling rate is higher than 100% because it also includes 15,168 tonnes of glass from commercial and industrial sources such as hotels, restaurants and catering and parallel imports (estimated at 30 KT).</p> <p>Quantitative data on impacts of the program on litter is not readily available.</p>
<b>Authorising legislation</b>	<p>The EC Directive on Packaging and Packaging Waste (2004/12/EC) and the Cooperation Agreement, which transposes the EC Directive to Belgium and includes specific targets.</p>



Figure 5: Typical Fost Plus Public Place Recycling Bin in Brussels, Belgium

## Swiss Packaging Programs

Switzerland opted out of the European Economic Area and so does not have to comply with the EC Packaging and Packaging Waste Directive. Swiss legislative requirements apply only to beverage containers.

As noted for the Swiss ADF on glass, the Swiss 2000 Beverage Containers Ordinance subsequently introduced mandatory deposits on non-refillable PVC as well as on all refillable containers and stated that deposits may be imposed on glass, PET or aluminium beverage containers if a material-specific 75% recycling target was not met. Producers could meet the PET and aluminium targets individually or through a collective system. The ADF in effect for glass beverage containers has been addressed previously.

It is important to note that in Switzerland, beverage containers are not collected in kerbside recycling systems. Swiss retailers are also required to provide collection opportunities for PROs on-site and citizens can be fined for failing to return items through approved recycling programs (although the latter is rarely if ever enforced).

Key features of the various Swiss sectoral schemes are provided in Table 11.

**Table 11: Key Features of Swiss Packaging Programs**

<b>Operation and management</b>	PRS (PET bottles), IGORA (aluminium cans), FERRO Recycling (steel cans) and VetroSwiss (glass bottles) run the system under the supervision of BAFU/OFEC (the environment authority) and UVEK/DETEC (the Department for Environment, Transport, Energy and Communication). IGORA and FERRO Recycling also handle non-beverage metal packaging from households.
<b>First Implemented</b>	1990 for most; IGORA began loaning out free can crushers in 1989.
<b>Packaging material or container types included</b>	All beverages except milk and milk products.
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Fee amounts and funding sources:</b> Suppliers of empty glass bottles for use in Switzerland, importers of empty or filled glass beverage bottles, and producers and importers of drinks packed in PET bottles or metal cans (and retailers in the case of home-brand products) fund the Swiss packaging systems.</p> <p>The PRS PET system is funded by a fee of CHF 0.02 (~\$0.02) per bottle.</p> <p>The IGORA aluminium system is funded by a fee of CHF 0.01 (~\$0.01) per can. Food tubes and trays are also charged at CHF 0.01 (~\$0.01) per unit. The charges cover about half the collection costs; the aluminium industry pays the rest. In 2006, IGORA's payments to the local authorities were increased from CHF 60 (~\$71.17) to CHF 80 (~\$94.90) per tonne to reflect the higher scrap value of aluminium and in 2008 it was increased again to CHF 100 (~\$118.62) per tonne.</p> <p>FERRO Recycling is funded by a voluntary contribution of CHF 0.01 (~\$0.01) per can from producers and importers. The contribution for catering-size cans (above 1.5 litres and up to 5 litres) is CHF 0.02 (~\$0.02).</p> <p><b>Liability point:</b> Beverage producers, bottlers, importers and distributors. All sales outlets must take back used containers.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> The Association for Environmentally Sustainable Beverage Packaging (whose members are the beverage producers, PRS and IGORA) produces market data on behalf of the environmental</p>



	authority. These data are relatively easy to check against the data submitted to the PROs in respect of the fees payable, as fees are paid per unit and there are not many companies involved. The environment authority and the sectoral organisations all report annually.
<b>Management and allocation of program funds</b>	<p>PRS pays local authorities for the PET they collect, subject to certain conditions: the site must be manned and accessible to the public, and the material must meet quality specifications (unsupervised sites have a much higher level of contamination).</p> <p>IGORA pays collectors (including individuals) CHF 13 (~\$15.42) per 10 kg, plus the scrap value, and provides the possibility of higher rewards through a lottery scheme. IGORA handles cans from retailers which have not joined the scheme.</p> <p>FERRO Recycling makes a contribution of CHF 100 (~\$118.62) per tonne to fund part of the cost of transporting the cans to the preparation plant (where the cans are sorted). FERRO Recycling picks up all the cost from there. For steel, unlike aluminium, there is no buy-back arrangement for individual end-users.</p>
<b>Collection types and coverage</b>	<p>Collection relies entirely on 'bring' containers for all materials. PRS provide ~29,000 bins for collecting and recycling PET, or around 3.8 collection points per 1,000 inhabitants. IGORA supplies ~10,000 can crushers to bars, restaurants and stations, and supplies branded collection bins (8,500 of them with a can-crushing facility) and collection bags free of charge to snack bars, cinemas, mountain huts, etc. FERRO Recycling operates a network of 4,000 'bring' containers. IGORA and FERRO Recycling encourage local authorities to collect both metals together in the same container because it saves money and improves collection yields by being convenient for consumers. The amount paid is the same regardless of whether the metals are collected mixed or separately.</p>
<b>Quantitative impacts on recycling and litter</b>	<p>2009 recycling data is as follows<sup>46</sup>:</p> <ul style="list-style-type: none"> <li>• <b>PET bottles:</b> 37,543 tonnes (5 kg per capita) for an 81% recycling rate</li> <li>• <b>Glass</b> (all glass, not just beverage containers): 331,507 tonnes (42 kg per capita) for a 95% recycling rate</li> <li>• <b>Aluminium cans:</b> 6,400 tonnes for a 91% recycling rate. While the recycling is mainly for cans, it also includes sauce tubes, food and pet food containers and trays, so a per capita rate for cans is not available.</li> </ul> <p>PET was the one material which did not initially reach its 75% recycling target. In 2003, for example, only 71% of PET was recycled. Members of PRS, which then represented around 85% of the market for PET, achieved 76%, but other producers, with individual compliance arrangements, achieved only 47%.<sup>47</sup></p> <p>Quantitative data on impacts of the program on litter is not readily available, although reports are that drink containers constitute 16% of litter in Switzerland<sup>48</sup>.</p>
<b>Authorising legislation</b>	Beverage Containers Ordinances of 1990 and 2000.

The Swiss system challenges the widely-held view that a CDS is the only way to achieve a high recycling rate for beverage containers. Swiss beverage container recycling rates are comparable with those in Sweden and Norway. The Swiss have achieved this by making collection containers available and convenient for everyone – at work, at play, on the move or close to home.



**Figure 6: PRS PET Recycling Bin in Basel, Switzerland**

## ALTERNATIVE APPROACH

Alternative approaches represent programs that increase beverage container recycling and/or decrease beverage container litter without a formal deposit, ADF or license fee such as the Green Dot.

Alternative approaches may incorporate various features of some of the other approaches, especially with regard to funding collections.

### *New Zealand Glass Packaging Forum*

The Glass Packaging Forum is a private, non-profit organisation responsible for addressing market demand and material quality for increased glass recovery in New Zealand.

Until the end of 2004, glass recycling contractors and councils were able to sell all recovered glass to New Zealand's only glass container manufacturer, O-I New Zealand. However, in 2004 glass collections began to exceed O-I's capacity to accept and recycle the glass collected, and therefore began to experience a lack of market demand. A Glass Users Group was established in 2005 and provided over NZ \$1 million (~\$798,000) to assist recycling operators with glass recovery.

In 2006 New Zealand recycled nearly 110,000 tonnes of glass, which again exceeded the available capacity of O-I, so councils and recyclers were in need of glass market development and the Forum was established. According to the Forum, "In order stop government intervention, stop gap measures were taken by some enterprises utilising glass packaging while an equitable approach embracing all in the supply chain was developed under the Forum"<sup>49</sup>. O-I has since added a new furnace, which has helped stabilise and increase market demand for recovered glass.

In May 2010, the Forum became the first packaging sector to receive Product Stewardship Scheme accreditation in New Zealand.

Key features of New Zealand's Glass Packaging Forum are provided in Table 12.

**Table 12: Key Features of New Zealand's Glass Packaging Forum**

<b>Operational and management aspects</b>	The Glass Packaging Forum is a private, non-profit organisation. Management is comprised of 4 part-time contractors.
<b>First Implemented</b>	The Forum was formally established in April 2006.
<b>Packaging material or container types included</b>	Glass containers sold in New Zealand.
<b>Financial flows, funding source, liability point and transparency</b>	<p><b>Levy amount:</b> NZD \$1.30 (~\$1.04) per tonne of glass placed on the New Zealand market.</p> <p><b>Funding source and liability point:</b> Voluntary levy on all those making, using or selling glass containers in New Zealand<sup>50</sup>. Collections are based on good faith self-reporting, as cross-checked against known market and consumption data. As the levy is based on consumption and material placed on the market, the levy is seen as equitable<sup>51</sup>.</p> <p><b>Transparency of financial flows and visibility to consumers:</b> Levy amounts are incorporated into product prices and not separately visible to consumers.</p>
<b>Management and allocation of program funds</b>	<p>A Forum objective to limit all administrative costs (broadly defined to include membership drives, community enquiries, data collections, etc.) to 50% of expenditure.</p> <p>The other 50% of program funding is dedicated to clearly defined projects which heighten the awareness of the critical issues, provide answers and further development of the Forum's relationships with local governments and community groups. These activities fall into three broad categories:</p> <ul style="list-style-type: none"> <li>• assistance in the provision of infrastructure to enhance the volumes and quality of the glass collected;</li> <li>• research into alternative uses for glass which is either not of a quality suitable for remanufacture into new containers or is at a location requiring excessive transport costs to forward to the glass maker; and</li> <li>• education programs that enhance the community's awareness of the need to recycle and how this can best be undertaken.</li> </ul>
<b>Collection types and coverage</b>	A strong focus is on stimulating market demand for recovered glass, including amending road specifications to include the use of glass cullet. Collections have been facilitated through the Forum's provision of a mobile crushing unit, improved infrastructure at processing facilities and small local crushers in specific areas <sup>52</sup> .
<b>Quantitative impacts on recycling and litter</b>	<p>The Forum has been appointed to run the Government's Love NZ recycling brand and related collection program up to and beyond the Rugby World Cup. This program covers all recyclable packaging materials and the Forum is running it as a separate function, with separate governance and financial accounts.</p> <p>Relevant quantitative data on impacts of the program on litter is not readily available, as the Forum's initiatives have been focused specifically on glass recycling. However, litter-specific approaches are under consideration.</p>
<b>Authorising legislation</b>	The Forum is purely voluntary; no legislation is required.

## RECOMMENDED APPROACHES

A shortlist of viable approaches for consideration in an Australian context was developed in consultation with project partners and based primarily on potential to tailor features of the approach to Australian conditions in order to ensure feasibility of the approach and potential fit with COAG's Principles of Best Practice Regulation.

Particular regard was given to existing Australian infrastructure and recycling systems in order to minimise potential negative impacts of program introduction. Parameters used to exclude models from further consideration included whether the approach:

- may not have tangible impact on recovery rates or litter reduction;
- does not align with the problems identified in the CRIS process; or
- may not have a positive cost-benefit result.

The shortlisting process was also intended to provide project stakeholders with several viable approaches within each category (such as CDS or producer responsibility approach) to consider. Although earlier versions of each approach were more readily distinguished from each other, various features have in fact merged somewhat over time and blurred the distinctions, particularly with regard to industry approaches. As a result, Australia-specific models have been developed for CDS based primarily on the Encorp Pacific model and for one hybrid producer responsibility approach.

## AUSTRALIA-SPECIFIC MODELS

Each approach's applicability to Australian conditions (with particular regard to existing infrastructure and recycling systems in order to minimise negative impacts) is addressed in this section. The parameters used to develop the Australia-specific models are provided in Table 13.

Each model's funding approach may or may not require approval by the Australian Competition and Consumer Commission, and would need to be developed in conjunction with key stakeholders in order to help ensure equity and effectiveness. Such implications of specific funding approaches are beyond the scope of this project.

**Table 13: Parameters to Help Tailor Approaches to an Australian Context**

Parameters Examined
<b>Operations</b> <ul style="list-style-type: none"> <li>• Range and types of containers / packaging</li> <li>• Who operates and participates in the approach and the role played by each (consumers, operators, recyclers, other participants)</li> <li>• Deposit / fee amounts (or other costs passed on to a particular party) and ability to change over time</li> <li>• Consumer engagement and participation, and consumer convenience</li> <li>• How the approach could be deployed as a national measure</li> <li>• Infrastructure requirements</li> <li>• Connection with and compatibility with existing waste management and resource recovery arrangements</li> <li>• Impact on market development for recovered materials</li> </ul>

### **Governance arrangements**

- Level of regulatory intervention - industry control vs. government involvement
- How governance is/could be effected at national and local levels
- Funding mechanisms and allocation of funds – e.g. funding from unredeemed deposits or fee proceeds
- Mechanisms to ensure/encourage transparency and accountability
- Enforcement requirements

### **Performance parameters**

- The objectives and strategic context of the approaches
- Quantitative impacts on recycling and litter:
  - Expected recovery rates and market value of recovered materials
  - Expected litter impact
  - Time taken for the approach to ramp up its impact on recycling and/or litter (e.g. if recovery rates have increased gradually over time to current levels)
- Development costs
- Operating costs
- Flexibility to control costs
- Other costs and benefits
- Ability to remain relevant and effective over time

## *Container Deposit Scheme*

The feasibility study of a CDS for Tasmania<sup>53</sup> developed a ‘hybrid’ CDS drawing on three principal models: ‘traditional’ CDS as in South Australia, California’s Government-driven approach and a not-for-profit, industry-driven approach as in British Columbia. The study proposed a model that is especially relevant for developing an Australia-specific model based on the Encorp Pacific approach.

### *British Columbia*

Provisions from the Tasmanian CDS feasibility study that are directly relevant to an Australia-specific model derived from British Columbia include:

- a deposit of 20¢ per designated container applied to all beverages in liquid or “ready to drink” form intended for human consumption;
- variable Container Recycling Fees to be paid to redemption operators to address program costs not captured in the deposit amount;
- a designated not-for-profit business responsible for implementing the CDS based on an open, competitive process and Ministerial appointment. Performance measures would include delivering optimal coverage and convenience and maximising return rates, whilst minimising program costs;
- ministerial authority to modify the scope of containers and other key program parameters as necessary; and
- regulatory provisions for addressing new beverage and packaging types as they enter the market.

All jurisdictions with CDS include non-refillables for beer sold through retail; water and carbonated soft drinks. Most non-US CDS programs have expanded their scopes to include still soft drinks that have become more dominant in beverage markets. The increased diversity in drinks and their wide variety of container types can lead to confusion and affects whether they can be redeemed through RVMs or must be returned to depots (for example, Sweden and Denmark exclude juice and milk as

they are commonly supplied in cartons that cannot be handled through RVMs). Fruit juices and drinks containing dairy products are usually excluded from European programs due to concerns about handling these items at retailers. As noted previously, Sweden excluded milk and juice for hygiene reasons when empty containers are returned to grocery stores.

Further details for the framework are provided in Table 14.

**Table 14: Framework for an Australia-specific Model Based on Encorp Pacific**

<b>Operations</b>	<p>Competitive tendering for service provision would need to be undertaken by the Commonwealth to help ensure a nationally consistent approach. Alternatively, the CDS scheme could be developed as a co-regulatory arrangement under the provisions of the <i>Product Stewardship Act 2011</i>, with beverage distributors and importers designated as liable parties in order to avoid free-riding under the system.</p> <p>By having a deposit of \$0.20 instead of \$0.10, this approach should help address the diminished deposit value over time that affects CDS programs and results in decreased recycling rates over time<sup>54</sup>; however, the high deposit amount would require additional security initiatives to minimise fraud. The private, non-profit system administrator would collect deposits and handling fees from liable parties and be responsible for managing funds consistent with achievement of the program’s objectives (recovery, consumer convenience, etc.).</p> <p>The <i>Product Stewardship Act 2011</i> does not address financial arrangements for co-regulatory or other product stewardship arrangements; specifics would need to be addressed via regulation and reflected in the information provided to the Minister for approval. The deposit amount would likely need to be changed via regulation, which would require government intervention to remain relevant over time. Retailers and distributors would be responsible for passing the deposits on to consumers. Consumers would need to return eligible containers to depots or RVMs in order to redeem their deposits. Virtually all recycling collection contracts between service providers and local governments would need to be renegotiated to some extent and penalty provisions would likely apply, as CDS introduction would reflect a policy change that would affect the economics of the contracts.</p> <p>Applying the CDS to all beverages in liquid or “ready to drink” form intended for human consumption would avoid some of the demarcation issues that affect many CDS models and enable the CDS to remain more relevant over time. However, this approach would still be limited to beverage containers and not applicable to the broader container types potentially included in other approaches, such as glass or plastic food containers. The broad scope would minimise some of fraud that would likely occur otherwise by reducing the number of non-eligible containers for which people may try to claim deposits. Applying CDS on a national scale would also reduce some of the potential cross-border fraud that would otherwise occur. The main source of potential fraud would likely be in trying to avoid deposit payments or in retailers and processors trying to claim extra handling fees.</p> <p>Although reliant upon a depot-based approach, some modifications to South Australia’s current CDS (including a change in deposit amounts) would be necessary to ensure a nationally consistent system and minimise potential distortions. However, such an approach could also remedy various inefficiencies within the South Australian approach. All European programs feature return to retail and the use of RVMs, rather than the depots common to North America and South Australia.</p> <p>The use of a depot-based system allows the collection of a broader range of container types than other CDS systems and allows for the fact that RVMs do not always accept or properly read eligible containers. However, RVMs should also be part of a modern CDS system as they can provide improved convenience and are potentially more cost-effective than other CDS approaches.</p>
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Applying British Columbia's depot coverage to Australia would require ~850 depots<sup>55</sup>. If depot operation were similar to Encorp Pacific's, independent owner/operators would be contracted by the program administrator and distributed geographically to ensure coverage and consumer convenience. Encorp Pacific requires owner/operators to invest up to CAD \$120,000 (~\$122,000) to cover leasehold improvements and various fees, depending on the size and location of the site, and invest working capital of up to CAD \$60,000 (~\$61,000) for each depot<sup>56</sup>. Under this approach, interested retailers, recyclers and other organisations such as sporting venues or clubs could become approved collection centres. Handling fees paid to collection facilities would need to be determined, but would likely be in the order of \$0.04 to \$0.05 per container. The Boomerang Alliance proposed \$0.037 in 2008<sup>57</sup>, South Australia's current handling fees are ~\$0.04 and Encorp Pacific's average \$0.048.

Various audits would be necessary to determine Australia-specific container mixes so that deposits can be redeemed in bulk for quantities exceeding, say, 50 containers per individual redeemer and to redeem deposits to councils and/or council contractors for those eligible beverage containers that remain in kerbside recycling systems.

To the extent that consumers are motivated by the deposit and redeem containers through depots and/or RVMs, the CDS would inevitably divert some eligible containers from kerbside and public place recycling programs. However, there is no directly appropriate model for which to project the potential shift in eligible containers, as only Germany has introduced CDS on top of comprehensive recycling and the distortions of the German program do not make it an appropriate example.

Encorp Pacific receives less than 1% of redeemed containers from kerbside recycling programs<sup>58</sup>. It is not likely that 99% of eligible containers would shift away from kerbside recycling given the popularity and convenience of kerbside recycling in Australia, and some proportion of recycling through depots and/or RVMs would consist of containers that would otherwise have been disposed of or littered. However, some indicative figures can be derived from actual splits (by weight) between CDS and non-CDS systems in South Australia and California as provided below.

Material Type	South Australia Recovery Split <sup>59</sup>		California Recovery Split <sup>60</sup>			
	CDS	Non-CDS	CDS 'Depots'	Supermarket Sited CDS	Kerbside	Other
Glass bottles/jars	62%	38%	48%	29%	20%	4%
Aluminium	100%	0%	60%	35%	4%	1%
PET packaging	83%	17%	52%	35%	10%	3%
HDPE packaging	10%	90%	44%	33%	18%	6%
Liquid paperboard cartons	50%	50%	N/A	N/A	N/A	N/A
Steel cans	0%	100%	N/A	N/A	N/A	N/A

While both South Australia and California have reasonably broad ranges of containers covered under CDS, applying CDS as described earlier across Australia would likely result in a somewhat broader range of containers. This broader scope, coupled with a \$0.20 deposit, would likely result in a relatively high proportion of eligible containers being diverted from kerbside and public place recycling. Public place recycling bins would also need to be modified to minimise pilfering of containers.



<b>Governance arrangements</b>	<p>Having a competitively-tendered operation with agreed performance measures and Ministerial sign-off for a set time period would help provide accountability whilst still providing flexibility for delivery. A Ministerial call for submissions and negotiations to determine service providers / system administration in accordance with agreed performance measures could be conducted, so long as the process establishes a set period for system delivery such as 5 years and Ministerial sign-off is involved, consistent with the co-regulatory arrangement process.</p> <p>Such tendering would help minimise impacts on existing systems, as existing operators would seek to compete based on available infrastructure and services. Creative approaches would be encouraged, such as recyclers teaming with community groups to collect and recycle a greater amount of materials.</p> <p>The program administrator should be provided latitude in the use of unredeemed deposits, so long as an audited financial overview is made publicly available. The <i>Product Stewardship Act 2011</i> focuses on the program administrator's ability to achieve program objectives and does not specify funding restrictions.</p>
<b>Performance parameters</b>	<p>The incentive value of this approach should result in the increased beverage container recycling and decreased beverage container litter common to CDS programs. A beverage container recycling rate of ~80% should be achievable and beverage container litter should be minimal, especially with a \$0.20 deposit. This impact would not likely impact non-beverage container litter.</p> <p>This CDS could result in a 6% reduction in litter count or 19% by volume<sup>61</sup>.</p> <p>A lead time of ~ two years would be necessary to develop and implement the program, depending on the specifics of the associated regulation, to prepare program objectives and plans, gain Ministerial approval, hire staff, seek owner / operators, audit kerbside container recovery to establish redemption rates, establish commercial arrangements and ensure infrastructure is in place. As they have not been implemented in Australia previously, RVMs would need to be ordered, configured for Australian currency, programmed for container redemption, delivered and installed. Software and modem connections would enable updating of RVMs as new beverages and/or container types enter the market.</p>

Both South Australia and British Columbia were able to design their depot-based systems around pre-existing facilities for returning refillable bottles; such facilities would not be available in states and territories outside of South Australia. While existing transfer stations and other waste management facilities would also be obvious candidates to become CDS depots, standard commercial options could also be utilised, as done in British Columbia. A typical 'storefront'-style depot is shown in Figure 7. Such depots could potentially be more convenient and more desirable for consumers than depots at waste management facilities. Given the variability and flexibility inherent in this approach, standard depot sizes and configurations are not readily available.



**Figure 7: Encorp Pacific CDS Depot in Parksville, BC, Canada**

### *Industry-driven Producer Responsibility Scheme*

Industry-driven packaging producer responsibility schemes have generally developed as approaches to avoid more prescriptive regulatory approaches such as CDS or bans of particular packaging or product types, or as a more cost-effective means of discharging producer responsibility requirements (such as the EC Packaging and Packaging Waste Directive). Although there may be consequences for failing to achieve specific performance measures (the German CDS resulted from industry failing to maintain a 72% market share for refillables), industry groups are generally given considerable leeway.

A hybrid Australia-specific producer responsibility approach has been developed to incorporate features of the following:

- The Swiss ADF on glass;
- Industry-driven Swiss packaging programs;
- The New Zealand Glass Packaging Forum; and
- Other models to assist in tailoring to Australian conditions.

A targeted ADF can be an effective means of addressing problematic material types, such as glass, where the number of affected companies can be small and more readily dealt with.

An Australian approach based on the Swiss glass ADF could provide the competition necessary to deliver services effectively, assuming that accountability to Government objectives would be required in order to get the contract for the next term. Vetroswiss highlight this accountability as a fundamental performance measure.

Under Switzerland's approach, deposits may be imposed on glass, PET or aluminium beverage containers if a material-specific 75% recycling target is not met. Producers could meet the PET and aluminium targets individually or through a collective system. Under the threat of CDS introduction if the recycling targets are not met, industry has considerable flexibility in how to fund and implement

their efforts in order to achieve the target. By volunteering to collaborate and establish their respective systems, the PET and aluminium industries avoided the greater regulatory intervention that the Swiss glass industry was subject to under the ADF.

New Zealand's Glass Packaging Forum provides a useful example of an approach that focuses more on stimulating market demand for recovered materials than on simply increasing supply through increased material collections.

Table 15 provides a framework based on a combination of these features and drawing upon features of other programs to provide a model for how such an approach could potentially be structured in Australia. We note that there would be some program overlap with initiatives such as the Covenant and the Packaging Stewardship Forum, but the key features of this approach would be significant increases in industry program funding coupled with significant industry flexibility in delivery.

**Table 15: Framework for an Australia-specific Industry Producer Responsibility Scheme**

<b>Operations</b>	<p>As with the CDS approach, competitive tendering for service provision would need to be undertaken by the Commonwealth to help ensure a nationally consistent approach. Alternatively, the scheme could be developed as a co-regulatory arrangement under the provisions of the <i>Product Stewardship Act 2011</i>. Whilst it would be preferable to establish this scheme as a voluntary arrangement, the Packaging Covenant experience has shown the co-regulatory approach is likely required to avoid free-riding. As significant funding above and beyond current Covenant funding requirements would be instrumental to this approach, free-riding could become an even greater concern.</p> <p>Suppliers of empty eligible packaging for use in Australia, importers of empty or filled containers, and producers and importers of products packed in eligible packaging would be responsible for funding a cradle to cradle approach for packaging incorporating sustainable packaging redesign, improved material recovery, market development for recovered materials and litter abatement. Appropriate designation as liable parties under the <i>Product Stewardship Act 2011</i> will likely prove necessary to address free-riding unless industry can devise an appropriate means of ensuring sufficient funding.</p> <p>Material-specific funding models and market development efforts would apply to major packaging material categories (with plastics either addressed collectively or by individual polymer types) on an agreed basis. Separate or collective funding and administrative bodies could be held responsible as arrangement administrators under the <i>Product Stewardship Act 2011</i>.</p> <p>The private, non-profit system administrator would collect funds from liable parties and be responsible for managing funds consistent with achievement of the program's objectives (recovery, consumer convenience, funding litter abatement, etc.). The <i>Product Stewardship Act 2011</i> does not address financial arrangements for co-regulatory or other product stewardship arrangements; specifics would need to be addressed via regulation and reflected in the information provided to the Minister for approval. The levy amounts would not need to be changed via regulation, thus minimising government intervention.</p> <p>While it is beyond the scope of this project to detail specific funding for this approach, it should be noted that applying an ADF or industry levy to broader packaging and product types could involve considerably greater cost and administrative difficulty than an ADF targeted specifically at individual materials such as glass. Plastic and paper products, for instance, have especially large variability in product types and brand owners across a large number of products. If the scope is restricted to one or a few container material types, then it is fairly straightforward to have one organisation responsible for collection and administration but potential impacts on recycling and litter would be diminished accordingly.</p>
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	<p>Applying the Swiss glass ADF proportionately to Australia would necessitate ~13,400 collection centres just for glass<sup>62</sup>. However, an important distinction between the Swiss and Australian systems is that the Swiss rely on ‘bring’ centres and collection bins and have effectively no kerbside recycling. Indicative collection systems for Australia would need to be scaled back proportionately to allow for the volume of materials that are already captured through kerbside recycling.</p> <p>An estimated 25% of Australian beverage consumption in glass containers is away from home<sup>63</sup>, so an indicative figure for Australia would be more like 3,350 glass bins for the glass not covered by kerbside systems.</p> <p>An Australian version of the Swiss packaging programs could be fairly broad, including most food and beverage packaging made of aluminium, glass and PET. Other packaging or material types could be added with the approval of the participating programs. For example, Nespresso aluminium coffee packets were added to IGORA’s aluminium collections through mutual agreement and funding.</p> <p>Applying the current Swiss collections proportionately to Australia would necessitate ~85,500 bins for PET<sup>64</sup> and ~33,600 for aluminium<sup>65</sup>. However, indicative collection systems for Australia need to be scaled back proportionately to allow for the volume of materials that are already captured through kerbside recycling.</p> <p>An estimated 45% of Australian PET beverage consumption is away from home<sup>66</sup>, so an indicative figure for Australia would be more like 38,475 PET bins for the PET not covered by kerbside systems.</p> <p>An estimated 25% of Australian aluminium beverage consumption is away from home<sup>67</sup>, so an indicative figure for Australia would be 8,400 bins for the aluminium not covered by kerbside systems.</p> <p>It is not known how many comparable public place recycling bins have been put in place by local governments in Australia, but a total of ~7,900 public place recycling bins have been installed by the packaging industry Australia-wide in locations such as entertainment centres, sporting venues, indigenous communities, higher education facilities and shopping centres<sup>68</sup>.</p> <p>Significantly expanded materials could have a detrimental effect on Australian recycling unless substantive market development accompanies the expanded collections. Therefore, the organisation(s) responsible for delivering this approach should be provided considerable leeway in using program funds to enable market development and a continued emphasis on material quality.</p> <p>In addition to enhanced public place recycling collections, significantly expanded funding for collection and reprocessing infrastructure and market development would be necessary to ensure that market stability accompanies increased material collections. These infrastructure improvements would be necessary at each step of the process. For example, glass crushers could be rolled out in even greater volumes to commercial facilities such as pubs, clubs and hotels while processing technologies could be further applied to reduce system losses from recycling facilities. However, such efforts may need to be accompanied by related efforts such as greater use of recycled glass in containers and expanded secondary market development for glass.</p> <p>Consumer engagement and participation may be less critical than for other measures, however consumer education of program objectives and intended outcomes could prove useful.</p> <p>Infrastructure requirements would vary depending on the material types involved. Ability to build upon existing infrastructure and programs, while minimising potential conflicts with such programs, is especially strong with this approach. This would also enable fairly rapid ramp up and response times.</p>
<b>Governance arrangements</b>	<p>An ADF could involve a fair amount of regulatory intervention, depending on its structure, in order to address free riders and ensure that participating organisations are not arbitrarily disadvantaged. Fee collections would need to address both domestic and imported</p>

	<p>products, and vary significantly in complexity. A key variable is the potential use of ADF proceeds; an ADF with significant government intervention for collection would entail greater government intervention in the allocation and use of program funds than would a purely industry-driven approach. The Swiss glass ADF is set by regulation according to the costs of collection and sorting, so the regulation would need to be changed in order to change the ADF amount.</p> <p>Regulatory intervention could be minimised under an agreed industry funding approach, as the approach could be operated as either a voluntary or co-regulatory approach and no underpinning legislation, rulemaking or government administration would be required. Contributing companies and their respective roles in the approach could be listed to ensure transparency and to minimise free-riding; these should also be reflected in Covenant Action Plans and Annual Reports as complimentary measures to the Covenant.</p> <p>Assuming an agreed funding approach, the primary governance arrangement under this approach would depend upon whether there was a recycling target established for relevant packaging (either collectively or by material type) and whether such a target and consequences of failure to meet the target(s) would have regulatory underpinning. Such an approach would be performance-based, rather than prescriptive, and therefore likely to be desirable on a cost-benefit basis for industry. Consistent with this performance basis, implementing organisations should be provided leeway in the use of program funds in order to best achieve targets in the most cost-effective way possible. Government intervention would be necessary to track progress against any targets and to implement prescriptive approaches if the targets are not met.</p>
<b>Performance parameters</b>	<p>Impacts on litter and recycling would vary significantly with the scope of items included and flexibility in using program funds.</p> <p>Fee amounts could vary depending on needs of the individual material types and funding needs, including:</p> <ul style="list-style-type: none"> <li>• increased contribution necessary to help address recycling and litter, as well as potential ability to influence recycling and litter levels; and</li> <li>• status of material markets.</li> </ul> <p>An emphasis on market development and improved collections represent a more sustainable approach, especially from an economic perspective, than simply increasing collections as CDS models do. Program priorities can be established and modified over time more readily than under regulatory approaches.</p> <p>Differentiation by material type and the quantity of material placed on the market could potentially be seen as more equitable than the current funding requirements for the Australian Packaging Covenant, which are based on organisation type and turnover and have remained essentially unchanged for over a decade. Covenant contributions tend to target packaging manufacturers over brand owners. Funding requirements based on the quantity of material placed on the Australian market could more equitably capture brand owners and retailer sales of private label products, which is an area of rapid sales growth.</p> <p>As the program funding and funding commitments can be altered to help address identified needs, there should be sufficient ability to remain relevant and effective over time. Standard commercial restrictions and accountability could be applied to funding commitments, which would help to control costs over time without requiring the accounting practices necessary to ensure implementation of deposits and handling fees or an ADF.</p> <p>Program performance against recycling and litter objectives should be incorporated in program targets, so long as the targets themselves and timeframes for implementation are clear from the start.</p>





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<sup>1</sup> The EC is one of three pillars of the European Union, the others being Justice and Home Affairs and the Common Foreign and Security Policy. The EC includes the European Single Market, which is the legal basis for the Packaging and Packaging Waste Directive.

<sup>2</sup> Martin Stewardship & Management Strategies Pty Ltd

<sup>3</sup> Whilst several policy instruments (especially those for electronics or PRO establishment) have been referred to as advance recycling fees (ARFs), this report uses the term ADF for consistency with most of the available literature. We note that references to “Advanced” disposal fees are incorrect and do not reflect authorising legislation or program implementation.

<sup>4</sup> Martin Stewardship & Management Strategies Pty Ltd

<sup>5</sup> BDA Group and WCS 2010

<sup>6</sup> See for example Envirobank (<http://www.envirobank.com.au/>). Some RVMs are also used to redeem used consumer electronics and mobile phones (such as ecoATM at <http://www.ecoatm.com/>).

<sup>7</sup> COAG 1997

<sup>8</sup> MS2 and Perchards 2009

<sup>9</sup> MS2 and Perchards 2009

<sup>10</sup> Ernst & Young 2009

<sup>11</sup> MS2 and Perchards 2009

<sup>12</sup> Personal communication with David Perchard and Gill Bevington of Perchards and Neil Hastie of Encorp Pacific

<sup>13</sup> The EFTA Surveillance Authority “monitors compliance with European Economic Area rules in Iceland, Liechtenstein and Norway, enabling them to participate in the European internal market” (<http://www.eftasurv.int/>, accessed June 2011).

<sup>14</sup> <http://www.resirk.no/engelsk/annual-report.aspx>, accessed June 2011.

<sup>15</sup> Resirk 2009

<sup>16</sup> [www.calrecycle.ca.gov/bevcontainer/](http://www.calrecycle.ca.gov/bevcontainer/), accessed June 2011

<sup>17</sup> <http://www.calrecycle.ca.gov/BevContainer/ProgramInfo/CRVFactSheet.pdf>, accessed June 2011

<sup>18</sup> <http://www.calrecycle.ca.gov/BevContainer/ProgramInfo/FactSheet.pdf>, accessed June 2011

<sup>19</sup> <http://www.calrecycle.ca.gov/bevcontainer/Rates/BiannualRpt/12MonPeriod.htm>, accessed June 2011

<sup>20</sup> In addition to specifically stated references, key data sources for this section are provided in Appendix A.



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<sup>21</sup> Details available at <http://www.return-it.ca/beverage/products/>.

<sup>22</sup> Personal communication with Neil Hastie of Encorp Pacific, June 2011

<sup>23</sup> Encorp 2011

<sup>24</sup> Encorp 2011

<sup>25</sup> Personal communication with Sharon Boyce of Encorp Pacific, June 2011

<sup>26</sup> Personal communication with Sharon Boyce of Encorp Pacific, June 2011

<sup>27</sup> Detail by material type and container size is available at [http://www.return-it.ca/ar2010/pdf/encorp\\_AR\\_2010\\_page1.pdf](http://www.return-it.ca/ar2010/pdf/encorp_AR_2010_page1.pdf), accessed June 2011.

<sup>28</sup> Personal communication with Neil Hastie of Encorp Pacific, June 2011

<sup>29</sup> <http://www.encorp.ca/cfm/index.cfm?It=100&Id=8&Se=2>, accessed June 2009

<sup>30</sup> ERM 2008

<sup>31</sup> ERM 2008

<sup>32</sup> ERM 2008

<sup>33</sup> OECD 2005

<sup>34</sup> Initial rates only are shown.

<sup>35</sup> MS2 Director Russ Martin developed and implemented the Florida ADF. Primary reference documents for the Florida ADF are original documents from this tenure.

<sup>36</sup> The targets were calculated as weight of containers filled or imported minus weight of containers recycled. An adjustment factor was built in to take account of market growth

<sup>37</sup> The 26 states in membership of the Swiss Confederation

<sup>38</sup> Personal communication with Marco Buletti and Isabelle Baudin of the Swiss Ministry of Environment, BAFU, in Bern, October 2010

<sup>39</sup> Personal communication with Marco Buletti and Isabelle Baudin of the Swiss Ministry of Environment, BAFU, in Bern, October 2010

<sup>40</sup> Personal communication with Fritz Stuker of Vetroswiss, October 2010

<sup>41</sup> MS2 and Perchards 2009

<sup>42</sup> MS2 and Perchards 2009

<sup>43</sup> MS2 and Perchards 2009, [http://pro-e.org/Frequently\\_Asked\\_Questions.html](http://pro-e.org/Frequently_Asked_Questions.html)



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<sup>44</sup> [http://www.fostplus.be/SiteCollectionDocuments/Leden/GP%20tarieven/GreenDot\\_UK.PDF](http://www.fostplus.be/SiteCollectionDocuments/Leden/GP%20tarieven/GreenDot_UK.PDF), accessed June 2011

<sup>45</sup> <http://www.apeal.org/newsletter/?p=67>, accessed June 2011

<sup>46</sup> Personal communication with Marco Buletti and Isabelle Baudin of the Swiss Ministry of Environment, BAFU, in Bern, October 2010

<sup>47</sup> MS2 and Perchards 2009

<sup>48</sup> Personal communication with Daniel Frischknecht of IGORA, October 2010

<sup>49</sup> <http://www.glassforum.org.nz/about.html>

<sup>50</sup> Members listed at <http://www.glassforum.org.nz/members.html>, accessed June 2011

<sup>51</sup> Personal communication with John Webber of the Glass Packaging Forum, June 2011

<sup>52</sup> For details, see <http://www.glassforum.org.nz/achievements.html>, accessed June 2011

<sup>53</sup> Hyder Consulting 2009

<sup>54</sup> MS2 2006

<sup>55</sup> Applying Encorp Pacific's 171 depots to British Columbia's 2010 population of 4,530,960 means that each depot serves approximately 26,500 people. Applied to roughly 22.5 million population in Australia would mean that ~850 depots would be necessary in Australia.

<sup>56</sup> <http://www.return-it.ca/beverage/industry/depot-opportunities/>

<sup>57</sup> Boomerang Alliance 2008

<sup>58</sup> Personal communication with Neil Hastie of Encorp Pacific, November 2010

<sup>59</sup> 2008-09, Hyder Consulting 2010

<sup>60</sup> Calendar Year 2009, <http://www.calrecycle.ca.gov/BevContainer/ProgramInfo/FactSheet.pdf>, accessed June 2011

<sup>61</sup> Based on BDA Group and WCS 2010 projections, which were based on California's fairly broad container coverage.

<sup>62</sup> Applying 4,000 Swiss glass collection points to Switzerland's 2010 population of ~6.7 million means that each collection point serves approximately 1,675 people. This factor applied to roughly 22.5 million population in Australia would mean that ~13,400 glass collections would be necessary in Australia.

<sup>63</sup> Hyder Consulting 2008

<sup>64</sup> In personal communications from October 2010, Swiss Environment Ministry officials reported ~3.8 PET collection bins per 1,000 population. This factor applied to roughly 22.5 million population in Australia would mean that ~85,500 PET collection bins would be necessary in Australia.



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<sup>65</sup> In personal communications from October 2010, IGORA reported ~10,000 aluminium collection bins (for a 2010 population of ~6.7 million). This factor applied to roughly 22.5 million population in Australia would mean that ~33,600 aluminium collection bins would be necessary in Australia.

<sup>66</sup> Hyder Consulting 2008

<sup>67</sup> Hyder Consulting 2008

<sup>68</sup> Personal communication with Jenny Pickles of the Packaging Stewardship Forum of the Australian Food and Grocery Council, June 2011