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DISCLAIMER
Opinions and recommendations in this study are those of Envision and do not necessarily represent those of the organisations that provided financial support or the international or local experts who provided information and advice.

ACKNOWLEDGMENTS
Envision would like to thank the following organisations and advisors who provided financial or technical support to enable this study to be undertaken:

LOCAL AUTHORITIES
Auckland Council, Carterton District Council, Central Otago District Council, Far North District Council, Gisbourne District Council, Hamilton City Council, Hastings City Council, Kawerau District Council, Ruapehu District Council, Selwyn District Council, Taupo District Council, Tauranga City Council, Waikato Regional Council, Wellington City Council, Waipa District Council, WasteNet Southland (Invercargill City Council, Southland District Council, Gore District Council)

BUSINESSES
InZide Commercial Ltd., J.J Recycling, Reclaim, Friendly Pak, Chandler Glass, Tomra Systems, One World Environmental Solutions Australia, Bio Bag World, Australia.

NOT FOR PROFITS AND SOCIAL ENTERPRISES
CBEC (Community Business and Environment Centre), Innovative Waste Kaikoura, WasteMINZ Strategic Investment Fund, Total Environment Centre (NSW Australia)

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Alice Leney (Pacific Reef Savers Ltd, New Zealand), Clarissa Morawski (CM Consulting, Ontario, Canada), Jeff Angel (Executive Director, Total Environment Centre), Geoff Johnston (CEO, One World Environmental Solutions, South Australia), Helen Spiegelman (Product Policy Institute, British Columbia, Canada), Marcus Fraval (Revive Recycling, Victoria, Australia), Robert Slater (Coleman Bright and Associates, Ontario, Canada), Robert Verhey, (former Environmental Strategy Manager, Local Government Association of NSW and Shires Associations of NSW, Australia), Susan Collins (CEO, Container Recycling Institute, USA), Scott Fraser (CEO, Encorp Pacific Canada), Vaughan Levitzke (Zero Waste South Australia), Wolfgang Ringel (TOMRA Systems ASA, Norway), Dr Emma Young (Director, Waste and Resource Recovery, Northern Territories EPA, Australia).

PUBLISHED NOVEMBER 2015
Sources of information and reports cited

This report draws on the expertise of international experts in the management, design, operation or oversight of CDS Container Deposit Schemes and also from a range of published information from reports, articles and websites including from not-for-profit, corporate and government sources. Wherever possible the most up to date information has been sourced. Where data has not been updated for several years, the most recent data has been used. This applies to some data from the Ministry for the Environment and the Packaging Council of New Zealand. Older reports such as the BEAR1 or Hudson2 reports have been referred to where the information used is still considered to be relevant and useful today.

Methodology

This updated report draws on 16 years of research and investigation by Envision and associates into Container Deposit Systems. It also draws on the expertise of the international experts who provided advice for the update in response to a 20 point questionnaire on how best to develop a CDS model for New Zealand.

Information was also provided by 16 New Zealand local authority representatives in response to a questionnaire on the costs and volumes of beverage containers recovered through kerbside and public space recycling programmes.

Additional data was sought from websites, reports and through phone and email contact with experts in both the public and private sectors in New Zealand and other countries. The financial data and assumptions used in the 2007 report have been updated in 2015 to reflect changes in population and new data that has come to hand.

The data collected for the 2007 report is utilised where it is still relevant.

The team believes that the content is fully in line with the observations and commentary generated by external professional peer review.

Declaration of Interest

No commercial interests are represented by this study and Envision does not stand to gain any commercial benefit in relation to the implementation of a CDS in New Zealand.

At the time of print, Envision supports the introduction of CDS in New Zealand because the independent research indicates it would create the highest recovery rates for the lowest cost and because of the positive impacts it will have on local communities, the environment and the social sector. However, Envision also undertakes to support any system that can be proven to create higher recovery rates and also deliver positive social benefits.

A list of related reports and activities carried out by Envision in relation to packaging and container recycling can be found in Appendix Four.
Glossary of Terms

In the first edition of *The InCENTive to Recycle* (2007), we used the term Container Deposit Legislation (CDL) to refer to container deposit systems and the legislation that supports them. For this 2015 edition we use the term Container Deposit System (CDS) to describe the system.

**Bottle Deposits:** A shorthand expression often used to describe refundable deposits on beverage containers

**Container Deposit Legislation (CDL):** Refers to any legislation that enables or mandates the establishment of a CDS

**Managing Agency:** Refers to a not-for-profit entity set up by stakeholders to establish and operate a CDS

**Redemption Centres:** Refers to the recycling centres where people can take their used bottles and cans for a refund (in jurisdictions that have a CDS). Also referred to as Buy-Back Centres, Drop-off Depots, Drop-off Points and Collection Centres.

**Kerbside recycling schemes:** Refers to collections (by Local Authorities or private operators) of recyclable materials (beverage and household cleaning containers, paper and cardboard etc.) from the kerbside in residential areas

**Public space recycling bins:** Refers to receptacles provided by local authorities or private businesses for the public to dispose of recyclable, used and empty beverage containers.

**TLA:** Refers to territorial local authorities. TLAs are also often referred to as ‘Councils’.

**Extended Producer Responsibility (EPR):** Refers to policies that encourage or mandate producers to take greater responsibility for the whole life cycle of the products they produce.

**Product Stewardship (PS):** Product Stewardship is sometimes used in place of ‘EPR’ and the terms have become more or less interchangeable.

**RVM (Reverse Vending Machine):** Refers to machines used in Europe and North America where consumers can insert their bottles in return for either cash or a docket that can be used to purchase items from the store the machine is in.

**System Cost:** Refers to the net annual operational cost (per container) of a CDS. The system cost is arrived at by subtracting all of the costs from all of the incomes associated with the system. This figure is then divided by the number of bottles sold (in the given year). This is the amount per bottle that the beverage producers need to contribute to keep the CDS financially viable. The system cost for the model proposed in this study is $0.005 cents (approximately one half of a cent) per beverage container.

**Unredeemed Deposits:** Refers to deposits added to beverage costs by producers and paid into the Managing Agency but that have not been redeemed due to recovery rates being less than 100%. Unredeemed deposits are used to support the operating costs of the CDS.
Acknowledgements ................................................................. 2
Sources of information and reports cited .............................. 3
Methodology ........................................................................... 3
Declaration of Interest ................................................................. 3
Glossary of Terms ...................................................................... 4
Contents ...................................................................................... 5
Executive Summary ..................................................................... 7
1.0 Introduction ........................................................................ 11
1.1 Background .......................................................................... 12
1.2 Container Deposit Systems and Product Stewardship .......... 12
2.0 Introducing Container Deposit Schemes .............................. 13
2.1 CDS - What they are .......................................................... 14
2.2 How they work ..................................................................... 14
2.3 Popular support .................................................................... 14
2.4 Common features of container deposit schemes ................. 15
2.5 Container deposit schemes work best within a closed system 15
2.6 New Zealand’s legislative framework for product stewardship 15
2.7 Countries, Provinces and States with Container Deposit Systems .................................................................. 16
2.8 New Zealand Local Authorities and CDS ............................ 17
2.9 Opposition to CDS ............................................................... 17
2.10 Positive Impacts of container deposit systems ................. 18
3.0 Developing a CDS model for New Zealand ....................... 25
3.1 Factors supporting the introduction of a CDS in New Zealand .................................................................. 26
3.2 Key Principles for Developing a CDL Programme ............... 26
3.3 Establishing New Zealand’s CDS – six key requirements ...... 27
3.4 Other aspects that should be considered for a New Zealand CDS .................................................................. 28
3.5 Potential Stakeholders and Roles ......................................... 29
3.6 CDS system flow diagram (materials and funds) ................. 30
3.7 Who Does What? ................................................................. 31
3.8 Setting up the system .......................................................... 32
3.9 Improved efficiencies .......................................................... 32
4.0 Costs and Benefits ............................................................... 33
4.1 Assumptions Made in Determining Costs and Benefits ........ 34
4.2 Costs (System Costs and benefits of CDS to the Beverage Industry) ................................................................. 38
4.3 Costs and Benefits to Central Government ......................... 41
4.4 Other Benefits to Local Government ................................... 42
4.5 Costs and Benefits to Recyclers ............................................ 42
4.6 Costs and Benefits to Retailers ............................................. 43
4.7 Costs and Benefits to Consumers/Ratepayers .................... 43
4.8 Costs and Benefits to Voluntary and Social Services Sectors .................................................................. 44
4.9 Costs and benefits to the Marine Environment ................. 44
5.0 Voluntary product stewardship in New Zealand .................. 45
5.1 A Common Theme – opposing the introduction of a CDS .... 47
5.2 Money spent on voluntary recycling initiatives for beverage containers ......................................................... 48
5.3 How well are voluntary programmes performing? ............. 48
5.4 Why voluntary measures under-perform ............................ 50
5.5 Not all large beverage producers oppose CDS .................... 52
5.6 Calls for change ................................................................... 52
6.0 Conclusions and Recommendations ................................. 53
6.1 Conclusions .......................................................................... 54
6.2 Recommendations ................................................................ 56
Appendices ................................................................................... 57
Appendix One: South Australia Case Study ............................... 59
Appendix Two: British Colombia Case Study ............................. 62
Appendix Three: Norway Case Study ......................................... 65
Appendix Four: Envision’s Previous Packaging Related Work .................................................................. 66
Appendix Five: Review of conversion ratios (tonnes per cubic metre and bags per cubic metres) used in this report .................................................................. 67
Appendix Six: Ministry for the Environment Funding for Glass and Beverage Recycling Projects 2010-2012 .................................................................. 69
Appendix Seven: Beverage Container Recycling Options for New Zealand - Survey of Local Authorities (Interim Report) .................................................................. 71
Appendix Eight: The Effect of ‘light-weighting’ of packaging on the recycling sector ......................................................... 74
Appendix Nine: Buy Back Events ............................................... 76
Appendix Ten: Refillables vs Single Use Bottles ......................... 77
Appendix Eleven: Reverse Vending Machines (RVMs) ............... 79
Appendix Twelve: Summary of US Litter Surveys ....................... 80
Endnotes ......................................................................................... 82
Executive Summary
Executive Summary

ABOUT THIS REPORT

In 2007 Envision NZ developed a model for a container deposit system (CDS) suitable to the New Zealand context. Eight years on, this report revisits and updates that model based on national and international developments.

Since 2007, more jurisdictions have introduced a CDS or propose to do so, and systems have been developed to make CDSs more cost effective, with some even operating at a surplus.

As part of the update, local authorities in New Zealand were surveyed for data and their opinions on kerbside, public space recycling schemes and a CDS for New Zealand. The initial results of the survey can be found in Appendix Seven.

BACKGROUND

New Zealanders consume an estimated 2.23 billion beverages each year and send over half the empty containers (over one billion) to landfills or dispose of them into the litter stream.

In spite of two Packaging Accords, publicly funded voluntary initiatives and an empowering Waste Minimisation Act, recycling rates for beverage containers remain low in New Zealand (estimated in this report to be below 40% and possibly as low as 30%) when compared to countries with CDSs where recovery rates of 80-95% are common.

ADVANTAGES OF CDSs

CDSs outperform other voluntary schemes because they:

a. Provide a financial incentive for consumers to return containers for recycling

b. Capture beverage containers consumed away from home

c. Transfer the cost of recycling beverage containers from local authorities to producers and consumers

d. Provide additional social benefits of increased employment, reduced litter and a reduction of plastic in the marine environment.

KEY FEATURES OF THE CDS MODEL

Key features of the CDS model proposed in this report are:

- Government declares beverage containers a priority product requiring a mandatory product stewardship scheme to be put in place and sets a system target rate of 85%.
- A minimum refundable 10-cent deposit applies to all beverage containers.
- A Managing Agency is set up by the beverage industry and other stakeholders to coordinate and manage the flow of materials and funds through the system.
- The Business and Social Enterprises sets up a collection system of convenient drop-off points where the public can receive refunds for their containers.
The InCENTive to Recycle

**BENEFITS**
The predicted benefits of the model include:

- At least double the quantities of all beverage containers recovered (with a target of 85%)
- At least 45,865 additional tonnes of containers diverted from landfill (an increase of 43%)
- At least 700 million additional containers diverted from landfill (an increase of 74%)
- Potential savings to NZ ratepayers of between $26million and $40million per annum from refuse collection savings (based on bag rates of between $2 and $3 per bag)
- Reduced litter and litter control costs
- Reduced costs to councils and ratepayers through higher kerbside recycling revenues
- Increased business opportunities for recyclers as a result of the increased volumes of clean recycled materials
- Up to 2,400 new, entry-level to managerial-level jobs spread throughout the country
- New business opportunities for entrepreneurs to set up collection depots
- New income streams for social service groups who can collect containers for refunds and also to set up social enterprises to operate collection depots

Collection points would receive a handling fee of around 3 cents per container from the Managing Agency to collect and sort containers.

The cost to establish collection point infrastructure would largely be borne by businesses seeking to maximise the commercial opportunities offered by the CDS. Funds from the landfill levy and system surpluses could also be used to help establish infrastructure.

**COSTS**
The majority of costs incurred would be covered by revenue from unredeemed deposits (described in the Glossary of Terms), interest on deposits held by the Managing Agency and income from the sale of recovered materials.

The net cost to operate the system would be an estimated $10 million annually. This equates to half of a cent (0.5 cents) per container. This cost would either be absorbed by beverage producers or passed on to consumers in beverage prices.

Local government is an important voice on this issue, as they currently pay the costs of cleaning up, recycling, or disposing to landfill, products that industry puts into the market without providing the financial means to properly recycle them.

**CONCLUSIONS**
After 20 years of voluntary measures, New Zealand’s beverage container recycling rates remain low (estimated at less than 40%) compared to states with CDS that routinely achieve rates of between 85% and 95%.

At least 45,865 tonnes (over 160,000 cubic metres by volume) of beverage containers are discarded into the litter stream, waterways and landfills each year.

Under a CDS, these containers would be recycled, creating potentially hundreds of new businesses, up to 2,400 new jobs and cost savings for local Authorities.

Ratepayers could reap potential savings of between $26million and $40million per annum from refuse collection savings (based on bag rates of between $2 and $3 per bag).

Local government is an important voice on this issue, as they currently pay the costs of cleaning up, recycling, or disposing to landfill, products that industry puts into the market without providing the financial means to properly recycle them.

An ‘eco-system’ of initiatives, programmes, research and public relations set up by the beverage and packaging industries have helped them to influence Government policy to ensure that product stewardship for
packaging remains voluntary. These interests have also accessed significant amounts of public and private funding which has enabled them to exert influence throughout the recycling industry and among councils and not for profits in their efforts to maintain the status quo.

Territorial authorities, recyclers, environmental groups and charities have been calling for government to lead on this issue of high public concern. This is confirmed by the responses to Envision’s recent survey of territorial authorities (Appendix Seven.)

CDS is a market-based instrument that is viable, effective and efficient at achieving high return rates for beverage containers at no cost to government. The net system cost of 0.05 cents per container is minor and shared between the producers and consumers of beverages. As such, CDS is a true example of Product Stewardship or Extended Producer Responsibility (EPR).

Public space recycling bins on the other hand are by far the most expensive way to recycle beverage containers and the costs fall mainly on local authorities. Where employed, they should be limited to a few high profile high foot traffic areas such as in busy tourist destinations.

CDSs co-exist well with existing kerbside recycling schemes and can actually make them cheaper to operate for local authorities and ratepayers.

There is nothing stopping New Zealand from adopting a well-proven world class recycling system for beverage containers.

The large beverage industry players in New Zealand are global companies, accustomed to regulations in many countries requiring them to take responsibility for their waste.

CDS is not new to them. They know how to operate under a CDS, but will only do so in New Zealand if required by Government. If not, they will continue to lobby extensively to maintain voluntary measures and have done so all over the world.

New Zealand should no longer continue with voluntary measures after 20 years of poor outcomes. It is time for change.

RECOMMENDATIONS
The key recommendations of this report are that:

1. Government declare beverage containers a priority product under the Waste Minimisation Act 2008 with a national recovery target of 85%.

   To achieve the 85% target, Government would require the establishment of a national Container Deposit Scheme (CDS) requiring producers to put a minimum refundable deposit on beverage containers to help ensure they are recycled at rates consistent with other OECD countries.

2. Concerned stakeholders work together to make the case nationally of the direct and wider benefits of a CDS for New Zealand, with a view to implementation by 2017.
Introduction
1.0 Introduction

1.1 BACKGROUND
New Zealanders use approximately 2.23 billion beverage containers a year. Although these containers contain recyclable materials that have value in the market, less than half are recovered for recycling. This problem has been longstanding and has led to at times passionate debate over whether voluntary or mandatory beverage container recovery schemes would have more success.

Generally speaking, the packaging industry and beverage producers support voluntary product stewardship and over the past 20 years have established a number of voluntary schemes in New Zealand.

However, feedback from local authorities and community recyclers suggests wide dissatisfaction with voluntary schemes, which have largely failed when recovery rates of less than 40% are compared with Container Deposit Systems operating internationally that routinely achieve return rates of 85 – 95%. Rather than the producers of containers bearing the costs of recycling their bottles, voluntary schemes leave ratepayers bearing the bulk of the burden.

1.2 ABOUT THIS REPORT
In 2007 Envision wrote ‘The InCENtive to Recycle’, a report which proposed a model for a mandatory Container Deposit System (CDS) for New Zealand. This study updates that model and compares the cost effectiveness of different methods for recycling beverage containers based on initial results of a survey of local authorities in New Zealand.

While it is common for industry bodies to promote systems that best meet their commercial objectives, it is important that the interests of stakeholders other than the beverage and packaging industries are made known and protected. Therefore, this study aims to balance information disseminated by interests opposed to CDSs.

A panel of international experts provided advice for the updated CDS model based on best practice examples from Europe, North America, Australia and the Pacific.

This report provides case studies for some of the CDS programmes operating internationally and has drawn on relevant examples in proposing a suitable CDS for New Zealand.

1.3 CONTAINER DEPOSIT SYSTEMS AND PRODUCT STEWARDSHIP
The concept of Product Stewardship is where producers and consumers take responsibility for the whole life cycle of the products they produce. The burden is transferred from the wider community (and individuals not involved in the production or consumption of the product), to the producer of the product and the consumer who purchased it.

The term, Extended Producer Responsibility (EPR), is sometimes used in place of Product Stewardship and the terms have become more or less interchangeable. Container Deposit Systems pre-date the concept of Product Stewardship.
Introducing Container Deposit Schemes
2.0 Introducing Container Deposit Schemes

2.1 CDSs - WHAT THEY ARE
A Container Deposit Scheme (CDS) is any programme that adds a refundable deposit to the price of a container to encourage the return of that container for recycling or refilling. A CDS can be voluntary, for example when a company has a distinct container that it wants returned, or mandatory, as in the case of a CDS mandated by legislation covering all types of beverage containers and all beverage producers.

2.2 HOW THEY WORK
The following diagram shows the basic mechanics of how a CDS works. A more detailed chart, showing material and money flows in a typical CDS can be found on Page 30.

2.3 POPULAR SUPPORT
CDSs are popular with the public wherever they operate. For example, over 95% of South Australians support refundable deposits on beverage containers. A survey in Western Australia showed 94% support for a government initiative to bring in CDL, and a nation-wide survey found that 88% of Australians want container deposits. In the province of British Columbia, Canada, a 1998 study found that 96% of British Columbians thought that container deposits were a good idea. More recently Newspoll in Australia found that 90% of the community support the NSW government’s decision to introduce a 10-cent refundable deposit on drink bottles and cans.

CONTAINER DEPOSIT SYSTEMS – HOW THEY WORK

- Charges 10c deposit → material flows
- Pays 10c deposit ← money flows
- Receives 10c refund
- Add 10c deposit
2.4 COMMON FEATURES OF CONTAINER DEPOSIT SCHEMES

Container deposit schemes share common characteristics that enable them to function efficiently and with minimal government or local authority involvement. These include:

- Mandate (legal basis for the system)
- Beverages and containers included in the system
- Targets and penalties
- Deposit amount and fees
- System operator
- Take-back network (comprised usually of return to depot and/or retail)
- Reporting/accountability (return rates, system profit/loss etc.)

2.5 CONTAINER DEPOSIT SCHEMES WORK BEST WITHIN A CLOSED SYSTEM

As a rule, CDSs require a closed system such as a whole country or an island to operate within. A single city or region setting up a CDS would run the risk of containers from other areas being trucked in for the refunds with the potential to financially ruin the system. An example of cross border fraud occurred at Sacramento, California in May 2015, where the Department of Resources Recycling and Recovery (CalRecycle) announced the arrest of a semi-truck driver on recycling fraud charges. The driver was charged with importing out-of-state empty beverage containers for the purpose of defrauding the California Redemption Value (CRV) fund. His truck contained a total of 8,548 pounds of aluminium and 1,522 pounds of plastic with a potential value of more than $15,000 in illegal CRV refunds.

2.6 NEW ZEALAND’S LEGISLATIVE FRAMEWORK FOR PRODUCT STEWARDSHIP


Once the Minister has declared beverage containers a priority product, a mandatory product stewardship scheme could be set up by industry, with a minimum refundable deposit placed on all beverage containers to ensure they are recycled.
2.7 COUNTRIES, PROVINCES AND STATES WITH CONTAINER DEPOSIT SYSTEMS

Container Deposit Systems operate in many countries and states around the world with at least 35 systems operating for non-refillable, one-way packaging. Many other places operate combined systems for refillable and one-way packaging – and some for refillable containers alone. At least two more countries intend to introduce bottle deposits and there are numerous campaigns around the globe for the introduction of deposit systems. Most of the opposition to CDS comes from the beverage and packaging sectors that spend large amounts of money fighting their introduction.

**Canada** – Alberta, British Columbia, Manitoba, New Brunswick, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon Territory

**Europe/Middle East** – Croatia, Denmark, Estonia, Finland, Germany, Iceland, Israel, Netherlands, Norway, Sweden

**Pacific** – Kiribati, American Samoa

**USA** – California, Connecticut, Delaware, Hawaii, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, Vermont

**Australia** – South Australia, Northern Territories
In 2015, the New South Wales government announced it would introduce a CDS. Previously Western Australia and Tasmania have both conducted investigations into options for the introduction of container deposits and in the past the Victorian State Liberal Party has announced election commitments to enact CDL in that State. Environmental advocacy group the Boomerang Alliance, made up of 30 of Australia’s leading community and environment groups, is campaigning for a 10-cent refund on bottles and cans across Australia.

2.8 NEW ZEALAND LOCAL AUTHORITIES AND CDS
There is renewed interest by New Zealand Local Authorities in CDS as indicated by the councils that have provided financial support for this report and the comments received from council’s that have responded to the survey of local Authorities carried out for this report (see Appendix Seven, for interim results).

Auckland Council is among the councils providing leadership on the issue. At their 6th August 2015 meeting, Auckland Council passed the following resolution: “That the Regional Strategy and Policy Committee endorse that council works with Local Government New Zealand and advocates to Central Government on the need to develop comprehensive container deposit legislation similar to the container scheme observed in South Australia”.

Auckland Council’s vision of Zero Waste by 2040 along with its position on CDS provides significant validity for greater investigation by the New Zealand Government into the feasibility of establishing a national CDS.

2.9 OPPOSITION TO CDS
The Beverage Industry puts significant resources into fighting CDS internationally whenever local interest is expressed, including the example of the Australian Northern Territories. In spite of strenuous efforts by the beverage industry to stop its introduction, the Northern Territories government enacted its container deposit legislation in 2012. Subsequently Coca-Cola, Schweppes and Lion Nathan unsuccessfully took Federal Court action against the Northern Territory Government in a last attempt to halt the scheme.
2.0 Introducing Container Deposit Schemes

2.10 POSITIVE IMPACTS OF CONTAINER DEPOSIT SYSTEMS

A number of positive impacts have been observed in areas with a CDS in place. Fifteen are briefly listed below and then outlined in more detail:

1. Higher Recovery Rates
2. Resource Conservation
3. CO2 Reductions
4. Extended Landfill Life
5. Reduction in Litter
6. Infrastructure for other products
7. Reduced Costs to Government
8. Reduced Costs to Councils and Ratepayers
9. Higher Returns for Recyclers
10. Wider Range of Materials Recycled
11. New Job Creation
12. Small business Start-up Opportunities
13. New Income streams for Non-Profits
14. Fewer Glass Injuries
15. Increased Public Engagement

HIGHER RECOVERY RATES

Countries as well as states and provinces with CDS routinely achieve beverage container recovery rates of 80%-95% or more.

The following graph from 2006, shows how in the USA (where CDL recovery rates are low compared to places like Canada and Scandinavia), states with CDL routinely achieve more than twice the beverage container recovery rate of those without. The reason rates are so high in Canada is because all provinces have enacted legislation to capture beverage containers through a CDS.

In 2006, the 11 states with deposit-refund legislation in the U.S. had an average collection rate of 72% with an average of 490 containers collected per capita. The 39 non-deposit states had an average collection rate of 28% with an average of 191 containers collected per capita. In 2009, the overall plastic bottle-recycling rate was still only 28% of all plastic bottles consumed in the United States even with the positive influence of high recycling rates in CDS states.

Recycling rates in the US have hardly improved since 2006. “Bottled Up” a recent report by the Container Recycling Institute showed that the 11 U.S. states with active container deposit laws in 2010, consistently recycled containers at rates of 68%-96%, while the overall recycling rate for beverage containers in non-deposit states was 30% in 2010.

The graph below shows the impact of increasing South Australia’s deposit/refund from 5 to 10-cents in 2008 in spite of the global financial crisis when beverage consumption went down.

SOUTH AUSTRALIAN RETURN RATES

COLLECTION RATE AND NUMBER OF UNITS COLLECTED PER CAPITA IN USA

source of graph details: South Australian Environmental Protection Agency
2.0 Introducing Container Deposit Schemes

RESOURCE CONSERVATION

Doubling the recycling rate and increasing the range of containers collected means far fewer virgin resources are needed to make new containers, which saves energy and reduces pollution in the production process. A 2005 report to the US Senate outlined concrete examples (see box).

One tonne of recycled plastic saves 5,774 kWh of energy, 16.3 barrels of oil, 98 million BTUs of energy, and 30 cubic yards of landfill space.

One tonne of recycled glass saves 714,000 BTUs of energy and 7.5 pounds of air pollutants from being released.

One tonne of recycled aluminum saves 40 barrels of oil and 238 million BTUs of energy.

One ton of recycled steel saves 1.8 barrels of oil and 10.9 million BTUs of energy.

CO₂ REDUCTIONS

Higher recycling rates, particularly for materials like aluminium and PET, translate into significant savings in energy and greenhouse gas emissions — which are directly linked to climate change. The British Columbia CDS is estimated to have reduced 562,900 tonnes of greenhouse gases between 2008 and 2012.

According to a report by USA’s Container Recycling Institute (CRI), if the 153 billion containers wasted in 2010 had been diverted back to the manufacturing stream, the U.S. could have saved the equivalent of 203 trillion BTUs of energy — enough to power nearly all the homes in the cities of Los Angeles and Chicago combined. This level of recycling would also have eliminated the release of 11.6 million tons of greenhouse gas (GHG) emission—that’s roughly one-fifth of total GHGs represented by America’s municipal solid waste, equivalent to taking nearly 2.3 million cars off the road.

EXTENDED LANDFILL LIFE

Previous studies estimated that New Zealand could recycle an additional 40,000 or 67,000 tonnes of beverage containers (and therefore not end up as litter or in landfills) if New Zealand had a CDS. This report estimates that a CDS would increase recycling (and reduce waste) by 45,865 tonnes annually (an increase of 43% by weight) and by 750 million containers (an increase of 74% by count and volume). Assuming a compaction ratio of 4 cubic metres to the tonne, recycling an extra 45,865 tonnes would mean 183,460 cubic metres of beverage containers were diverted from landfills or the litter stream every year.

However measured as loose volume (at just over 18 cubic metres to the tonne), 45,865 tonnes of mixed beverage containers would be 836,000 cubic metres. This is equivalent to at least 700 Boeing 747 airplanes filled with containers each year. Ratepayers bear the costs of these containers when they end up in the streets and waterways through litter control, public education costs and the unknown long term costs of attempting to clean up the marine environment. Ratepayers also pay to have them picked up from public litter bins or if they put them out in pre-paid rubbish bags which are based on volume. Table Nine (Page 43) shows that if all of this material was put out in $2 pre-paid refuse bags it would cost Ratepayers over $26 million per annum and in $3 bags it would cost over $40 million per annum. Not all communities have user-pay bags and and some cover at least some refuse disposal costs through general or targeted rates so the picture is more complex. In the mix of disposal costs (user pay bags, rates funded bin or bags), the overall sums may be less than if all household refuse was in user pay bags, regardless ratepayers are collectively paying very large sums for the cleaning up or disposal of the beverage containers they don’t recycle.

REDUCTION IN LITTER

Beverage containers are a major component of litter. Plastic, metal and glass drink containers topped Australia’s National Litter Index for four years in a row prior to 2014. CDL programmes reduce litter, which reduces
clean-up costs to councils and is better for tourism, with roadides and scenic locations much less littered with beverage containers. Many plastic bottles end up in the marine environment where they eventually break into micro-particles that are harmful to marine life.

South Australia has kept consistent quarterly litter counts since 1998 and as shown below, has the lowest percentage of beverage containers in litter than any other state or territory in Australia. Beverage container litter currently represents only 2.2% of litter items in South Australia, compared to 4.1% in the Northern Territory, 4.7% in Queensland, 7% in Victoria, 7.5% NSW and 13.2% in Western Australia.

If the 153 billion containers wasted in 2010 had been diverted back to the manufacturing stream, the U.S. could have saved the equivalent of 203 trillion BTUs of energy—enough to power nearly all the homes in the cities of Los Angeles and Chicago combined.

In the USA, the percentage of litter reduction in states where studies were conducted, fell between 53% and 84%, and total litter has been reduced by between 30% and 47%. In Germany, prior to the introduction of a mandatory CDS, littering from single-use beverage containers was estimated to be about one-fifth of the total litter volume.

Since the introduction of CDS there has been almost no littering of containers bearing deposits.

According to the Glass Packaging Forum, a recent litter survey in the Auckland region concluded that litter was made up of:

- 23% snack food packaging
- 14% fast food packaging
- 8% non-alcoholic drinks
- 5% alcoholic drinks
- 17% other types of packaging
- 33% non-packaging – e.g. tyres, nappies, electronics etc.

By comparison, a 2014 Clean Up Australia report found that, consistent with 2013 results, beverage containers and their associated rubbish made up 36% of all rubbish counted and were the highest percentage category of litter.
The 118 redemption centres in South Australia act as a collection network for other products such as scrap metals, tyres, e-waste and batteries. No council or government assistance is needed for this network as the baseline income is derived from the CDS handling fees.

Scout Recycling Centres, the trading arm of Scouts South Australia, operate 10 redemption depots with combined annual revenue of over $23 million. Sixty percent of this revenue is now derived from additional recycling services that the Scouts have been able to gradually add to their business model. This is all made possible because of the baseline revenue from the bottle redemption business. They provide $2.5 million dollars annually to Scouts South Australia making them the envy of other scouting organisations. The remaining redemption depots are operated mainly by small private businesses.

In British Columbia every depot collects at least one other stewardship product. 139 depots currently collect two or more stewardship products, 105 depots take three or more products and 70 take five or more stewardship products.

A CDS is a market driven mechanism that has been proven to require minimal government involvement or cost. For example, in South Australia only three government employees are required to oversee and monitor the programme and to review an annual, independently audited report to ensure targets are met and standards maintained. The two compliance officers also undertake additional duties, including overseeing plastic bag reduction and non-licenced monitoring activities.

In British Columbia six staff provide oversight of 20 stewardship programmes with combined revenues of $200 million and only one person is required to oversee the province’s deposit refund scheme.

Additionally the costs of promotional campaigns to maintain public interest and participation in recycling would become the responsibility of the CDS and no longer a cost to Government.

Based on the South Australian EPA’s CDS operations budget of $8500, plus salaries of $263,000 (including costs of superannuation, leave etc.) and allowing a sum of $20,000 for use of Government vehicles and travel, the New Zealand Government could potentially oversee a CDS for less than $300,000 per annum.
2.0 Introducing Container Deposit Schemes

REDUCED COSTS FOR LOCAL AUTHORITIES AND RATEPAYERS

Savings to Local Authorities include reduced litter collection and clean-up costs (streets and storm water), and landfill costs (reduced landfill volumes mean less pressure to find new landfill sites). They also provide an independent source of funding for community and not-for-profit groups thus reducing their reliance on government and local government funding for community programmes.

A key claim by interests opposed to CDS is that kerbside recycling schemes will become less viable or more expensive with the introduction of beverage container deposits. The following examples indicate otherwise:

- A report by the Association of Municipalities of Ontario found that mandating deposits on glass bottles would reduce the net costs of kerbside programmes by $19 to 23 million.
- A 2011 ‘Packaging Impacts Consultation Regulatory Impact Statement’, released by Local Government South Australia estimated that a CDS would save NSW councils $23 to $62 million on annual recycling costs.
- Municipalities in British Columbia estimated net savings of approximately $10 million following the expansion of their deposit programme to include alcohol, water and juice containers.
- A study for the Massachusetts Department of Environmental Conservation, found that expansion of the state’s deposit programme would save municipalities over $500,000 annually in avoided litter abatement costs.
- An assessment of the potential financial impacts of a CDS on Local Government in Tasmania estimated savings of $1.3 million per annum and reduced litter management costs of about $160,000 per year.
- A study by COAG Skew found that a national CDS would save local authorities in Australia $2.5 billion over 20 years.

HIGHER RETURNS FOR RECYCLED MATERIAL

Materials recovered through CDS programmes can be sold at higher prices than those recovered from kerbside collections because there is less contamination. Recycled materials from South Australia command a significant premium over material from non-CDS states. Proceeds from the sale of product can be used to help offset system costs.

Material from the British Columbian CDS commands higher prices as explained by Scott Fraser, CEO of Encorp Pacific (which runs the CDS for non-alcoholic beverage containers):

“Beverage container aluminium is a specific alloy and remelt facilities for can sheet aluminium need that alloy, so they pay above market for uncontaminated aluminium cans (ie, without aluminium pie plates, foil, etc.) relative to mixed aluminium streams. Similarly, our PET can be put into food-grade recycling streams (eg, making new PET beverage containers) that command higher values than mixed non-food (new shampoo bottles, or plastic benches) plastics streams”.

WIDER RANGE OF MATERIALS COLLECTED

CDSs also tend to recover a wider range of beverage containers than are accepted in kerbside collections. For example, this means Tetra Pak containers could be included in a New Zealand CDS as they are in South Australia, even though they may not be accepted at the kerbside.
JOBCREATION

CDL is a catalyst for job creation and if introduced into New Zealand will create new jobs. These range from entry-level jobs, suitable for those coming off unemployment benefits or seeking part-time or casual work, to a range of skilled and managerial positions. In South Australia, (population 1.5 million) CDL has created over 1,600 full and part-time jobs. In British Columbia, (population 4.1 million) Encorp Pacific (which runs the CDS for non-alcoholic beverage containers) employs 750 people in the CDS (other jobs are created in the CDS for alcoholic beverages) and the CDS in Nova Scotia (population 942,926) creates around 600 jobs and $20 million in salaries and wages30. Using Nova Scotia’s employment figures, New Zealand with a population of 4.471 million could potentially create over 2,500 new jobs if a CDS was introduced.

NEW OPPORTUNITIES FOR SMALL BUSINESS START-UPS

Auckland Council is supporting the development of a regional Resource Recovery Network (RRN) in an attempt to significantly reduce the amount of reusable materials going to landfill and is part of its goal for Zero Waste by 2040. If New Zealand had a national CDS, Auckland could potentially have as many recycling centres as Adelaide, at little or no cost to Council.

NEW INCOME STREAMS FOR NOT-FOR-PROFITS

Bottle deposits provide opportunities for not-for-profit groups to raise funds for their causes through bottle drives and through donation of bottles by supporters. Some New Zealand social service providers are keen to see CDL introduced to help reduce their reliance on government and private grants which are time-consuming to apply for, or gambling-generated funds, which create an ethical dilemma for many groups.

FEWER GLASS INJURIES

CDSs can reduce the number of incidences of injuries to children’s feet from broken glass31 on beaches, roadsides and parks. And improve road safety for cyclists who currently contend not only with punctures from broken glass but also potential accidents from avoiding glass on roads.

The issue of injuries from glass was raised in the Western Australian Legislative Assembly 4th May 2006 by Perth Member of Parliament J.N Hyde who stated; “We have the ability, at no cost, to cut by 63 % the number of injuries to children from cut glass - that is, to cut the number of presentations to hospital by 63 % - by introducing container deposit legislation”32. Reduced numbers of people presenting at emergency clinics would benefit the health system by reducing the time and resources needed to treat these injuries.

INCREASED PUBLIC ENGAGEMENT

CDL puts a value on resources and rewards positive behaviour. This can translate into better support for other recycling activities such as kerbside collections. Anecdotal evidence from South Australia indicates that the culture of care that has developed around ensuring that bottles are collected and redeemed has transferred to other areas of behaviour change with regards to waste minimisation.

Using Nova Scotia’s employment figures, New Zealand with a population of 4.471 million could potentially create over 2,500 new jobs if a CDS was introduced.
2.0 Introducing Container Deposit Schemes

Envision New Zealand
Developing a CDS model for New Zealand
3.0 Developing a CDS model for New Zealand

3.1 FACTORS SUPPORTING THE INTRODUCTION OF A CDS IN NEW ZEALAND
In line with international trends, New Zealand is dealing with rapidly increasing volumes and types of packaging, as well as an increase in products being consumed away from home. In contrast to international trends, New Zealand continues to rely on voluntary measures to solve the problem. However, there are a number of factors that support changing the status quo and introducing a CDS to New Zealand. These factors include:

- Legislation is already in place under which a CDS would sit
- Increased political awareness of the need to address climate change
- Public demand for political parties to develop effective environmental policy
- Public and local government frustration at 20 years of costly voluntary measures that have not halted the rise of packaging waste
- The need to reduce the impacts of large quantities of beverage containers entering the marine environment
- An existing network of community and council operated recycling centres that could operate as collection depots
- The potential for social service groups to generate funds for their work by setting up and operating depots as the Scouts have successfully done in South Australia
- A large proportion of the population that fondly remembers the bottle deposit system that existed until the 1970s and is enthusiastic about re-establishing a CDS in NZ
- Increased interest and support for CDS in Australia with South Australia’s scheme having operated for over 40 years, the Northern Territories scheme now in the third year of operation and NSW announcing it will adopt Container Deposit Legislation in the near future.

3.2 KEY PRINCIPLES FOR DEVELOPING A CDL PROGRAMME
The following principles have been developed as criteria for developing a CDS model for New Zealand.

- **Self-governing:** A self-governing, self-funding system that requires minimum government (or other) support or intervention to keep it working
- **Democracy:** Control of the system with the public represented by the Minister for the Environment
- **Diversity:** As many sectors of society as possible should benefit from the system
- **Proximity:** Drop-off points should be well distributed to reduce unnecessary travel
- **Convenience:** It should be as easy to drop off empty containers, as it is to buy them
- **Efficiency:** The system should run efficiently to keep (system) costs to a minimum
- **Transparency:** All aspects of the system should be open to public scrutiny
- **Simplicity:** The system should be easy to operate and understand
- **Costs:** The costs of the system should be borne by producers who manufacture and retail products, and the consumer purchasing the products, not by the wider community. The system should also be reasonably cost effective when compared to other methods of recycling beverage containers.

New Zealand’s voluntary product stewardship programmes meet hardly any of the above criteria whereas the CDS model proposed in this report fully meets them all.
3.3 ESTABLISHING NEW ZEALAND’S CDS – SIX KEY REQUIREMENTS

Following review of overseas models, input from international experts, and considering New Zealand’s free market political culture; a basic system design based on six key requirements for a New Zealand CDS is outlined below.

ONE: Government declares beverage containers a priority product requiring participation by all beverage producers and importers in a product stewardship scheme. Government would set the targets, parameters and reporting requirements of the scheme as per item two below. The private sector and other key stakeholders would establish and operate the system – at zero cost to Government.

TWO: Government sets the parameters of the CDS including:
- Roles and responsibilities
- Recovery targets
- The value of the deposit
- The range of containers the deposit applies to
- Conditions for introducing new packaging types
- Ownership of unredeemed deposits
- Prescribed level of convenience for public drop-off
- Who can operate depots
- Reporting requirements
- Penalties for non-compliance

THREE: Beverage producers/importers are required to join a Stewardship Agency (in this report called the Managing Agency) to establish and operate all aspects of the system. For practical purposes it’s likely that beverage companies would join in one Managing Agency. However the door should be open for individual companies or groups of companies to set up competing systems as long as they meet the government standards.

FOUR: Managing Agency/Agencies are required to provide a Stewardship Plan to government for review and approval no later than six months after beverage containers are declared a priority product. This action will require them to develop the plan, and ensure readiness on day one of implementation. An alternative approach could be considered whereby the Government would require that there be only one multi-stakeholder operated Managing Agency for the whole country.

FIVE: All ‘ready-to-drink’ beverage containers (including milk) over 300ml and under 3 litres are required to carry a deposit. This includes containers that are not currently recycled such as Tetra-Pak, pouches and tubed beverages. It also includes refillable bottles such as those that are currently part of the “Swappa Crate” system. Plain milk containers are excluded in some countries because they are mainly drunk at home and can be collected through kerbside recycling. However in 2009 Alberta brought milk (which was previously excluded) into their CDS because recovery rates were too low (23% for paper cartons and 60% for plastic bottles) and weren’t meeting the province’s target of 85%.

SIX: CDS Managing Agency/Agencies are required to produce independently audited annual reports, which include financial records, the recycling rate, operational aspects, and continuous improvement plans.

Note: Industry groups cite commercial confidentiality as a reason they cannot disclose the data behind their recycling claims. CDSs around the world require full disclosure of industry data and this has not stopped beverage companies operating within CDS jurisdictions.
3.4 OTHER ASPECTS THAT SHOULD BE CONSIDERED FOR A NEW ZEALAND CDS

- A New Zealand CDS should be rolled out and operational within one year of the Minister declaring beverage containers a priority product requiring a Mandatory Product Stewardship programme (This report proposes 2017 as the implementation date). However a longer period of (eg, up to three years) could be negotiated to reach the 85% target recovery rate.

- The deposit should be set at a minimum of 10-cents and this should apply to all container sizes. However the legislation should give the Minister the flexibility to increase the deposit in increments of 10-cents, if required to meet the recovery targets of the CDS. The Minister should also be able to increase the deposit on containers over 1 litre to improve system performance.

- The CDS regulations should require producers to demonstrate that their containers are fully recyclable or refillable before they can be introduced into the market.

- The Managing Agency should be allowed to retain unredeemed deposits to offset costs of the system – but only if recovery targets, stipulated by legislation, are met. If these are not met, unredeemed deposits should revert to the Government for redistribution amongst community groups to run container recycling promotion campaigns. The threat of these funds being redistributed is needed to avoid a CDS Managing Agency keeping the recycling rate low in order to reap the windfall profits from unredeemed deposits.

- Handling fees paid to operators of the collection points should be negotiated between the Managing Agency and operators on a case-by-case basis. Government should though have the power to resolve disputes. Handling fees should be transparent within the system but do not need to be made visible to the public.

- Net costs of operating the system, (to cover administration, payment of refunds and handling fees to buy-back centres etc.), that aren’t covered by unredeemed deposits, interest on deposits and material sales, should be borne by brand owners in the form of a Recycling Fee (estimated to be $0.05 cents in this report). Brand owners will have the option to absorb these costs or pass them on to consumers. This is an effective form of ‘shared responsibility’ between the producer and consumer in line with ideal product stewardship practice.

- A New Zealand CDS should adopt a combined return-to-retail and return-to-depot collection system to achieve the twin goals of high container return rates and maximum local wealth creation. Large retailers would be required to participate by setting up an in-store or car park redemption point (possibly contracted out to a suitable operator). They could however opt out of the CDS if there is a buy-back depot within a reasonable distance from the store. Participation would be voluntary for small retailers such as dairies and small grocery stores.

- The number of collection points should be determined by the Managing Agency who will be mandated to achieve the CDS target return rates. As with British Columbia and South Australia, a minimum convenience standard could be developed to ensure that the bulk of the population are within a reasonable distance from a drop-off point.

- The Managing Agency would be required to provide opportunities for operators of existing recycling infrastructure to participate in the depot collection network but will be entitled to make the final decision as to which sites will be licensed to act as return points.
The Managing Agency should be entitled to ownership of, and the proceeds from the sale of materials collected by return points (depot or retail) to offset system costs. It can either develop its own material consolidation facilities or contract this function to external recycling processors.

To avoid opportunities for fraudulent collusion, the Managing Agency should be required to ensure that separate operators carry out buy-back, transportation and material consolidation functions.

The decision on which method to use for sorting containers should be left to the Managing Agency - as long as recovery targets are met. However it is more efficient to sort by container type than by brand. The latest automated sorting technology enables the brand information to be captured for producers as well as sorting by container type for the most cost effective management of the materials within the CDS.

There should be strong penalties for selling beverages not labeled in accordance with the system requirements, for dumping recovered materials and for failure to meet system targets. The importance of high recovery targets along with the need for a clear message of what the penalties would be for non-compliance is critical in order to ensure optimum performance and integrity of the CDS.

The CDS must be mandatory to achieve full industry participation and high container return rates.

### 3.5 POTENTIAL STAKEHOLDERS AND ROLES

The following table shows how different stakeholders could be involved in a New Zealand CDS:

<table>
<thead>
<tr>
<th>ENTITY</th>
<th>POTENTIAL ROLE/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government – Potentially represented by the Environmental Protection Agency or a separate regulatory unit within MfE (to separate MfE policy and regulatory activities)</td>
<td>Legislation / oversight / regulatory control</td>
</tr>
<tr>
<td>Packaging and Beverage Manufacturers</td>
<td>Managing Agency</td>
</tr>
<tr>
<td>Retailers</td>
<td>Operators of return-to-retail systems</td>
</tr>
<tr>
<td>Local Authorities</td>
<td>Operators of depots</td>
</tr>
<tr>
<td>Private Recycling Operators</td>
<td>Operators of depots and processing facilities, represented on the Board of Managing Agency</td>
</tr>
<tr>
<td>Community Recycling Network</td>
<td>Operators of depots, represented on the Board of Managing Agency</td>
</tr>
<tr>
<td>Voluntary and social service groups, schools etc.</td>
<td>Operators of depots, represented on the Board of Managing Agency</td>
</tr>
<tr>
<td>Local businesses</td>
<td>Operators of depots</td>
</tr>
</tbody>
</table>
3.6 CDS SYSTEM FLOW DIAGRAM (MATERIALS AND FUNDS)
CONTAINER DEPOSIT/REFUND SYSTEM –FLOW CHART

**CONSUMER**
- Pays price of drink plus deposit of 10 cents
- Consumes drink at work, home or public place

**RETAILER**
- Pays Producer 10 cents on top of the wholesale price and charges consumer retail price plus 10 cent refundable deposit

**BEVERAGE PRODUCER**
- 10 cent deposit is added to the price and paid (by the brand owner) to the Managing Agency. Net system costs are included in the price - typically less than 1 cent.

**MANAGING AGENCY**
- Receives 10 cent deposit from producer. Refunds Collection Points on the basis of their records of refund payments. Also pays handling fee to Collection Points to cover their costs.

**COLLECTION POINT**
- Depot, Retailer or Reverse Vending Machine. Refunds deposit to customer. Costs are covered by handling fee from Managing Agency

**KERBSIDE RECYCLING BIN**
- Picked up by contractor who claims redemption value of containers.

**LITTER STREAM**
- Picked up by individual or community group. Refund collected from Collection Point

**MATERIAL CONSOLIDATOR**
- Receives and processes materials on behalf of Managing Agency for sale to End Markets

**END MARKETS**
- Recovered materials sold for re-manufacture into new containers or for other end uses.

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3.7 WHO DOES WHAT?

GOVERNMENT
• Declares beverage containers a priority product requiring a mandatory Product Stewardship scheme and sets the system parameters
• Monitors the system

BEVERAGE WHOLESALER:
• Adds 10-cents to the cost of the beverage
• Pays 10-cents, plus a small container recycling fee\(^3\) to the Managing Agency

RETAILER:
• Passes the 10-cent deposit on to the consumer as part of the cost of the beverage.

CONSUMER:
• Pays 10-cents extra for the beverage
• Takes empty container back for 10-cent refund to either a collection depot or a participating retailer, or gives it to a local charity to redeem, or puts it out in the kerbside collection

COLLECTION POINT (DEPOT AND PARTICIPATING RETAILER):
• Pays 10-cent refund back to consumer
• Sorts containers and, (by arrangement with Managing Agency) may carry out some initial processing (baling etc.)
• Invoices Managing Agency for 10-cent deposit plus handling fee\(^4\)

TRUCKING COMPANY
• Provides transportation services under contract to the Managing Agency. Cannot operate a Collection Point or Consolidation Facility to avoid conflicts of interest

KERBSIDE RECYCLING CONTRACTOR:
• Picks up and sorts deposit-bearing containers from kerbside
• Delivers containers to material consolidation facility
• Invoices Managing Agency for 10-cent deposit plus handling fee or forgoes the handling fee and markets materials directly (unlikely due to probably lower income)

MATERIAL CONSOLIDATION FACILITY (UNDER CONTRACT TO MANAGING AGENCY):
• Receives containers from Collection Points
• Processes materials (glass, plastics, aluminium, steel etc.) to container manufacturer or other end user under contract to Managing Agency

MANAGING AGENCY:
• Administers or contracts out administration of the system
• Collects administration fee (0.5 cents per container) from beverage producers
• Pays out handling fees to Collection Points
• Manages the flow and marketing of materials
• Promotes and advertises the system
• Gathers system performance data and reports back to Government
3.8 SETTING UP THE SYSTEM
Once Government has declared beverage containers a priority product requiring a mandatory product stewardship scheme, beverage producers and other stakeholders will need to set up an entity if they wish to act as the Managing Agency to operate the scheme.

Although the model allows for more than one Managing Agency to be established (to protect the system from monopolistic practices), it is likely that stakeholders will work together to form a single entity to fill the role. The Managing Agency will either employ staff and operate the system itself or contract a private operator or non-profit entity to operate it.

Once the Managing Agency is established with a governing board and suitable staff, it will need to prepare (and submit to Government) a Stewardship Plan outlining how all aspects of the deposit scheme will function and how it will be implemented within the timeframes required by Government.

Key tasks in the first year will be to establish a network of drop-off points where the public can redeem their containers. These drop-off points will be licensed on the basis of performance requirements around safety, public convenience, site presence, and constant improvement. Local Authorities might carry out the licensing role for the Managing Agency.

As long as they continue to meet the performance requirements of the deposit scheme, drop-off centres would be free to offer recycling facilities for scrap steel, reusable products and other product stewardship items such as e-waste and tyres.

Once the CDS is established, the Managing Agency’s role is to manage all aspects of the system on a daily basis and to fulfil government reporting requirements.

3.9 IMPROVED EFFICIENCIES
Since Envision’s 2007 report, new technologies have become available which will help reduce overall system costs through reducing the time involved in various aspects of the system. These include:

- **Mechanical sorting technology** reduces the time required to manually count containers at drop-off points.
- **Improved reverse vending machines (RVMs)** enable customers to redeem containers quickly and conveniently. RVMs can be located in grocery stores and other retail locations where beverages are sold as well as at drop-off depots. Consumers simply place their containers in the RVM, which scans the bar codes, sorts by material type and processes them before sorting them into different bins. The RVM provides the customer with a voucher that can be redeemed for cash or credit inside the store.
- **Drop and Go Systems** where customers can drop pre-labelled bags of beverage containers without waiting in line for their refund. In Oregon, customers can sign up for a “Bottle Drop” card and within 48 hours of dropping off their bottles their online account is credited which can then be redeemed at any Bottle Drop retail kiosk.
Costs and Benefits
4.1 ASSUMPTIONS MADE IN DETERMINING COSTS AND BENEFITS

In order to determine the costs and benefits of a New Zealand CDS, data was adapted from the South Australian Container Deposit System\textsuperscript{37} to reflect New Zealand’s population. Additionally HDPE milk containers and glass wine bottles were added into the system for the New Zealand CDS model.

The following assumptions have been made in assessing the costs and benefits of the proposed CDS model.

**ASSUMPTION 1:**
CDS would increase recycling (and reduce waste) by 45,865 tonnes annually (an increase of 43\% by weight) and by 750 million containers (an increase of 74\% by count and volume)

**Rationale:** The model estimated a 2.23 billion beverage container consumption figure (explained in assumption 2). The CDS recovery rate in South Australia is 79\% by numbers and 84\% by weight. Achieving these results in New Zealand would lead to an extra 45,865 tonnes being recovered (a 43\% increase), an extra 750 million containers recovered (a 74\% increase) or an extra 836,000m\textsuperscript{3} in loose volume recovered.

**ASSUMPTION 2:**
An estimated 2.23 billion beverages are sold and consumed annually in New Zealand

**Rationale:** Information on the number of beverages produced/consumed in New Zealand is not readily or easily available. For this reason we have used data from the South Australian CDS to develop our model. We have also compared this with data from British Columbia in Canada (British Columbia has a similar population to New Zealand). Approximately 1.8 billion beverages were produced/consumed last year in British Columbia. This equates to 391,38\textsuperscript{th} containers per person per annum – or 1.1 containers per person per day. New Zealand’s population (4,471,000) consuming on average 1.36 beverages per day equates to around 2.23 billion beverages consumed annually. The British Columbia CDS legislation does not include milk bottles, which are suggested for inclusion in the NZ model.

Western Australia data\textsuperscript{39} estimated 1.1 billion containers produced/consumed for a population of 2 million – or 1.5 containers per person per day. This consumption rate would translate to 2.29 billion containers produced/consumed in New Zealand annually (thereby adding validity to the estimate made above).

**TABLE 1: ADDITIONAL MATERIAL RECYCLED WITH CDS**

<table>
<thead>
<tr>
<th>PACKAGING MATERIAL TYPE</th>
<th>TOTAL (EST) TONNES PRODUCED</th>
<th>2010 NZ RECOVERY RATES</th>
<th>CDS MODEL</th>
<th>DIFFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RECOVERY RATES BY WEIGHT</td>
<td>RECOVERED TONNES</td>
<td>RECOVERY RATES BY NUMBERS</td>
<td>RECOVERED TONNES</td>
</tr>
<tr>
<td>Glass</td>
<td>142,342</td>
<td>64%</td>
<td>91,099</td>
<td>86%</td>
</tr>
<tr>
<td>Aluminum</td>
<td>11,802</td>
<td>45%</td>
<td>5,311</td>
<td>84%</td>
</tr>
<tr>
<td>Plastic</td>
<td>24,960</td>
<td>40%</td>
<td>9,984</td>
<td>70%</td>
</tr>
<tr>
<td>Liquid Paper Board</td>
<td>3,206</td>
<td>0%</td>
<td>-</td>
<td>62%</td>
</tr>
<tr>
<td>Total</td>
<td>182,310</td>
<td>58%</td>
<td>106,394</td>
<td>79%</td>
</tr>
</tbody>
</table>
Using Australian National Packaging Covenant (NPC) comparative data, potentially 2.844 billion beverage containers are sold in New Zealand annually. However the conservative estimate of 2.23 billion containers (21% lower) has been used (using the same packaging type proportions as the Australian NPC data).

### TABLE 2: ESTIMATED NUMBER OF CONTAINERS PRODUCED/SOLD IN NEW ZEALAND (USING COMPARATIVE AUSTRALIAN DATA)

<table>
<thead>
<tr>
<th>PACKAGING TYPE</th>
<th>AUSTRALIA TONNES</th>
<th>NEW ZEALAND EQUIVALENT TONNES</th>
<th>CONTAINERS PER TONNE(^{29})</th>
<th>TOTAL NZ CONTAINERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>850,000</td>
<td>175,326</td>
<td>4,784</td>
<td>839,000,000</td>
</tr>
<tr>
<td>Aluminium Cans</td>
<td>45,741</td>
<td>9,435</td>
<td>66,821</td>
<td>630,000,000</td>
</tr>
<tr>
<td>Plastic PET</td>
<td>117,930</td>
<td>24,326</td>
<td>29,205</td>
<td>710,000,000</td>
</tr>
<tr>
<td>Plastic HDPE</td>
<td>160,842</td>
<td>33,178</td>
<td>20,008</td>
<td>664,000,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,174,513</td>
<td>242,275</td>
<td>182,310</td>
<td>2,844,000,000</td>
</tr>
</tbody>
</table>

### TABLE 3: ESTIMATED NUMBER OF BEVERAGE CONTAINERS CONSUMED IN NEW ZEALAND (USING SOUTH AUSTRALIA CDS DATA)

<table>
<thead>
<tr>
<th>CDS PRODUCT</th>
<th>TOTAL CONSUMED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NUMBERS</td>
</tr>
<tr>
<td>Glass - Bottles</td>
<td>510,571,761</td>
</tr>
<tr>
<td>Glass - Wine Bottles</td>
<td>59,441,172</td>
</tr>
<tr>
<td>Aluminium Cans</td>
<td>818,411,498</td>
</tr>
<tr>
<td>PET</td>
<td>413,080,898</td>
</tr>
<tr>
<td>HDPE Non Milk</td>
<td>43,813,693</td>
</tr>
<tr>
<td>HDPE Milk</td>
<td>232,532,070</td>
</tr>
<tr>
<td>Liquid Paper Board (LPB)</td>
<td>156,802,454</td>
</tr>
<tr>
<td>TOTALS</td>
<td>2,234,653,548</td>
</tr>
</tbody>
</table>

**ASSUMPTION 3.**

A CDS (with a 10-cent deposit/refund) will achieve a recovery rate of approximately 79% - 1.758 billion beverage containers per year.

**Rationale:** Overseas examples show that CDSs achieve the primary goal of increasing recovery rates for beverage containers. They also show a strong correlation between the level of the deposit and the recovery rate – ranging from as low as 65% with deposits...
4.0 Costs and Benefits

of 5 cents (e.g. California) to over 95% with deposit values of 20-40 cents (e.g. Germany). A target recovery/recycling rate of 79% has been used (to match the 2013 results from the South Australia CDS which is a mature system and market). This translates to the potential recovery of 1.758 billion containers annually in New Zealand. Table 4 shows the potential number of beverage containers that will be recovered and recycled under a CDS (2.23 billion x 79%) broken down into recycling categories.

ASSUMPTION 4:
Approximately 20% of containers recycled under a CDS (351 million) will be recovered via existing kerbside or commercial collection schemes

Rationale: This aligns with data from California showing that 20% of beverage containers are returned via kerbside collections. In Western Australia, an investigation into best practice CDL systems anticipated that 37.5% of containers would be recycled at home via kerbside collections. The lower estimate is used.

TABLE 4: ESTIMATED NUMBER OF BEVERAGE CONTAINERS RECYCLED IN NEW ZEALAND WITH CDS

<table>
<thead>
<tr>
<th>CDS PRODUCT</th>
<th>RECOVERY UNDER CDS MODEL FOR NZ</th>
<th>% Recovered</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass - Bottles</td>
<td></td>
<td>86%</td>
<td>440,716,267</td>
</tr>
<tr>
<td>Glass - Wine Bottles</td>
<td></td>
<td>86%</td>
<td>51,308,540</td>
</tr>
<tr>
<td>Aluminium Cans</td>
<td></td>
<td>84%</td>
<td>690,205,913</td>
</tr>
<tr>
<td>PET</td>
<td></td>
<td>70%</td>
<td>291,030,356</td>
</tr>
<tr>
<td>HDPE Non Milk</td>
<td></td>
<td>56%</td>
<td>24,707,786</td>
</tr>
<tr>
<td>HDPE Milk</td>
<td></td>
<td>70%</td>
<td>163,827,210</td>
</tr>
<tr>
<td>Liquid Paper Board</td>
<td></td>
<td>62%</td>
<td>96,978,031</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>79%</td>
<td>1,758,774,103</td>
</tr>
</tbody>
</table>

ASSUMPTION 5:
The handling fee paid to Collection Points will be in the order of 3 cents per container.

Rationale: The handling fee is paid to Collection Points to cover handling costs.

The final figure will be decided by negotiation between the Managing Agency and Collection Points and may vary depending on factors such as distance from processing centres. The handling fee is not passed on in full to the beverage industry (or consumers), as income generated by the CDS offsets the final cost to industry. The graph below shows a range of handling fees for CDSs in different countries. The handling fee may change slightly from year to year to reflect changes in the actual system cost of the CDS at the time.

CDS HANDLING FEES

ASSUMPTION 6:
Although the number of beverage containers in kerbside collections will reduce with CDS, kerbside-recycling revenues would increase (see Table 7).

Rationale:
a. The value of material per tonne, collected under CDS is significantly higher than the value of material collected under the current kerbside system. For example one tonne of loose PET plastic containers is currently valued at around $200 per tonne (0.70 cents per container). Under the proposed CDS system one tonne of PET plastic containers would be valued at $3,385 (11.7 cents per container) increasing the value per container by 1,492%.

b. The revenue Collectors receive per container under CDS will be made up as follows:
   • The deposit value (10-cents including GST) on containers put out at kerbside
   • The handling fee of 3 cents (excluding GST) per container (the same as what Collection Points receive). Alternatively, material can be sold directly to end users and the handling fee forfeited.
TABLES 5: INCREASE IN REVENUE PER CONTAINER AND PER TONNE FOR KERBSIDE RECYCLING CONTRACTORS IN NEW ZEALAND WITH CDS

<table>
<thead>
<tr>
<th>RECYCLERS REVENUE COMPARISON - CURRENT MARKET</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDS Product</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Glass - Bottles</td>
</tr>
<tr>
<td>Glass - Wine Bottles</td>
</tr>
<tr>
<td>Aluminum Cans</td>
</tr>
<tr>
<td>PET</td>
</tr>
<tr>
<td>HDPE Non Milk</td>
</tr>
<tr>
<td>HDPE Milk</td>
</tr>
<tr>
<td>Liquid Paper Board (LPB)</td>
</tr>
</tbody>
</table>

Note: Revenue is excluding freight

<table>
<thead>
<tr>
<th>RECYCLERS REVENUE COMPARISON – UNDER CDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>REVENUE UNDER CDS</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Glass - Bottles</td>
</tr>
<tr>
<td>Glass - Wine Bottles</td>
</tr>
<tr>
<td>Aluminum Cans</td>
</tr>
<tr>
<td>PET</td>
</tr>
<tr>
<td>HDPE Non Milk</td>
</tr>
<tr>
<td>HDPE Milk</td>
</tr>
<tr>
<td>Liquid Paper Board (LPB)</td>
</tr>
</tbody>
</table>

Note: Revenue is excluding freight

Data and information from overseas, shows that CDS will potentially remove around 80% of applicable CDS containers from the kerbside collections. Information from South Australia indicates that around 6 CDS containers on average per week remain in the kerbside bins43.

- Table 6 (next page) shows that the zero impact position is achieved when three CDS containers per week remain in the kerbside bin as revenue from three CDS containers for the collection contractor will equal their current revenue from sale of CDS material on the open market.
- Table 6 also shows that one single CDS container per week left in the kerbside bin is worth $6.08 in terms of annual revenue to the contractor. So every container above three per week left in the bin will potentially reduce the required payment to the contractor from the local Council by $6.08 per house per annum.
- If there were six CDS containers per week left in the kerbside bin then this would potentially reduce the required payment to the contractor from council by $19.26 per household per annum.
- As an example this would result in Auckland Council potentially saving $9.6 million per annum ($19.26 per household over 500,000 households).

The InCENTive to Recycle
4.2 COSTS AND BENEFITS TO INDUSTRY

A CDS will enable beverage producers to maintain control of their products throughout their whole lifecycle and in doing so, protect the quality and supply of raw materials for re-manufacturing containers. Information provided in 2010 to Envision by the Glass Packaging Institute, the trade association that represents the North American glass container industry pointed out that:

“The glass companies and other “energy intensive” industries, including aluminium and plastics are coming under heavy regulatory pressure at the national and state levels to reduce their emissions and have seen an increase in their reporting and permitting requirements, often based on their plants’ emissions levels. These factors have increased the desire from the glass companies for cullet (and in turn, consideration of bottle bill legislation where it makes sense). 80% of the cullet used in the glass plants in the U.S. comes from the 11 bottle bill states.”

There are also significant public relations benefits for the beverage industry that could prove particularly useful at a time when environmental and health-related issues are taking their toll on the industry’s reputation. This is particularly the case with the risks associated with their beverage containers entering the marine environment.

A central proposition of the model proposed in this report is that beverage manufacturers will pay the net cost (system cost) of the CDS in the form of ‘recycling fees’ levied by the Managing Agency. The net system cost is arrived at after factoring in:

1. All incomes generated by the system including income from the sale of recycled materials, unredeemed deposits and interest received on deposits, less;

2. All costs of operation including the costs of running Collection Points, administration, staff training, transport, processing, marketing etc.
### TABLE 7: NET COST OF CDS (SYSTEM COST) TO INDUSTRY (NOT INCLUDING INFRASTRUCTURE DEVELOPMENT44)

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>RATE</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of recycled materials¹ in tonnes</td>
<td>152,259</td>
<td>$119.62</td>
</tr>
<tr>
<td>Unredeemed deposits in numbers (21% of total)</td>
<td>475,879,445</td>
<td>$0.087</td>
</tr>
<tr>
<td>Interest on Deposits (2 months)</td>
<td>372,442,258</td>
<td>3.00%</td>
</tr>
<tr>
<td><strong>TOTAL INCOME²</strong></td>
<td></td>
<td>$60,711,361.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>RATE</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,758,774,103</td>
<td>$0.03</td>
<td>$52,763,223.00</td>
</tr>
<tr>
<td>Handling fees (paid to Collection Points)</td>
<td></td>
<td>$52,763,223.00</td>
</tr>
<tr>
<td><strong>Total Direct Costs</strong></td>
<td></td>
<td>$7,948,138.00</td>
</tr>
</tbody>
</table>

**GROSS SURPLUS**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>RATE</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance for increased redemption from 79-84%</td>
<td>5%</td>
<td>$1,970,515</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
<td>$4,500,000.00</td>
</tr>
<tr>
<td>Consumer Awareness</td>
<td></td>
<td>$4,500,000.00</td>
</tr>
<tr>
<td><strong>TOTAL POTENTIAL OVERHEAD COSTS</strong></td>
<td></td>
<td>$18,852,576.00</td>
</tr>
</tbody>
</table>

**NET SYSTEM COST**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,234,653,548</td>
<td>$10,904,438.00</td>
</tr>
<tr>
<td><strong>NET COST PER UNIT</strong></td>
<td>$0.005</td>
</tr>
</tbody>
</table>

**Note 1:** The value of recycled materials is based on current (conservative) market rates for the basket of materials in the model used for this report and is net of an assumed, conservative freight cost of $70 per tonne.

**Note 2:** Interest on deposits held by the Managing Agency are estimated based on an assumed two months lag from the time deposits are received to the time they are paid out to collection points. This is in line with results from British Columbia’s Encorp Pacific.

**Note 3:** $0.005 equals half of a cent per container, which would be the actual unit – or system cost that would need to be paid by beverage producers to maintain the viability of the system. The Managing Agency may negotiate higher handling fees with Return Depots, particularly in areas unable to send glass to OI in Auckland, due to prohibitive transport costs. This would increase the average cost per container to industry.
Note 4: Administration and Consumer Awareness costs are (generous) estimates and allow for considerable contingency. The System Cost arrived at above for a New Zealand CDS (half a cent per container) falls within the lower range of other programmes around the world as shown in the graph below from the ‘BEAR45 report’, (in Euro cents).

The ‘Hudson report’ on the South Australian CDL system commissioned by the South Australian EPA46, calculated that the net cost of South Australia’s CDL system in 2000 was $1.14 per person. This figure, applied to New Zealand’s population, comes to $5.09 million. The net CDL system cost arrived at for the model in this report is $10.9 million but includes a contingency cost of around $10 million (to allow for a potential increase in redemptions).

Additionally, significant surpluses can be accumulated in well-run systems. Encorp Pacific, the Managing Agency for non-alcoholic containers in British Columbia, recorded an average net surplus of $7.7 million or 0.63 cents per unit sold in the period 2011 to 201347 and currently holds operating reserves of $30.7 million. It should be noted though that the BC CDS charges among the highest recycling fees to beverage producers. There seem to be good reasons including geography for these higher fees. A New Zealand CDS would need to ensure that all aspects of the system are run as efficiently as possible to keep the recycling fees to industry as low as possible. See Appendix two, for the BC case study.

The BEAR report was issued 13 years ago and costs will have since varied. Even in the unlikely event that the system cost doubled to one cent, it seems a modest sum to ask of the beverage industry to ensure their products are recycled and kept out of landfills, the litter stream and waterways.

A 2013 Regulations Impact Report (RIS) prepared by Marsden Jacobs Associates for the Australian environment ministers, through the Standing Council on Environment and Water, determined that a CDS could operate at a surplus for some years, meaning at no cost to the consumer until around 2028, when the deposit would be increased to cover increased costs, as Jeff Angel, Executive Director, of the Total Environment Centre and Director of the Boomerang Alliance explains:

CDS in fact has been shown to reduce the costs of kerbside collections to councils, private companies and ratepayers.
“A national CDS run by a single coordinator that oversees all deposits and then redeems for returned containers will also have a surplus as not all deposits are redeemed under the best systems (about 80% at 10-cents deposit). This provides a large surplus to cover the scheme’s costs. In addition sale of the high value material collected is a revenue source. The Australian Packaging Decision RIS (Regulatory Impact Statement) contained a financial analysis, which is the best data on the actual flows of funds in a modern system as opposed to the economy wide CBA (Cost Benefit Analysis) also in the RIS which takes a different approach. The RIS found that the handling fee net of material sales was eliminated from the final system costs by the surplus up to 2028 (when an increase in the deposit may be required) (see section 3.2 of Regulations Impact Report). Even where the CBA found that over a 20 year period the NPV could be -$3.78b, this equates to 1 cent per container for significant environmental and economic benefits.”

4.3 COSTS AND BENEFITS TO CENTRAL GOVERNMENT

There would be no significant fiscal implications for Central Government. In fact there would be savings through less need for the Ministry for the Environment to be involved in negotiating, funding and establishing time-consuming voluntary initiatives. Overseas advice is that a CDS such as the one proposed may only require one or two staff members to monitor and review an independent, third party report annually to ensure legislative requirements, including targets, are met.

Government could, however, assist in the establishment of the collection infrastructure by allocating funds generated from the landfill levy via the Waste Minimisation Fund (WMF). It has already allocated recent grants in support of beverage container recycling and the establishment of recycling centres.

An additional benefit for Government is that regular accurate information on sales volumes and recycling rates for different beverage types would be available for the first time in New Zealand. Also the CDS incentive structures would ensure that beverage producers only introduce fully recyclable containers into the market.

4.3.1 POSITIVE IMPACT ON KERBSIDE COLLECTIONS:

The main argument by opponents of CDS is that Councils’ investment in kerbside recycling programmes will be threatened. The facts show that the opposite is true. CDS in fact has been shown to reduce the costs of kerbside collections to councils, private companies and ratepayers. As the Hudson report pointed out, “Councils benefit from ratepayers forgoing redemption of their container deposits.”

As per Table 6, (reproduced below as Table 8) information from South Australia indicates that there is currently around six CDS applicable containers in kerbside containers weekly. Each CDS container is worth $6.08

| TABLE 8: ESTIMATED IMPACTS OF CDS ON MATERIAL SALES FROM KERBSIDE COLLECTIONS |
|-----------------|---|---|---|---|---|---|
| CDS Containers per week left in Kerbside Bin | 1 | 2 | 3 | 4 | 5 | 6 |
| Per Annum CDS Containers | 52 | 104 | 156 | 208 | 260 | 312 |
| CDS Deposit Redemption Revenue per bottle | $0.087 | $0.087 | $0.087 | $0.087 | $0.087 | $0.087 |
| CDS Handling Fee Revenue per bottle | $0.030 | $0.030 | $0.030 | $0.030 | $0.030 | $0.030 |
| Total CDS Revenue for Kerbside Collector | $6.08 | $12.16 | $18.25 | $24.33 | $30.41 | $36.49 |
| Current Revenue from Sale of Containers | $17.23 | $17.23 | $17.23 | $17.23 | $17.23 | $17.23 |
| Reduction in Council Payment | ($11.15) | ($5.07) | $1.01 | $7.10 | $13.18 | $19.26 |
4.0 Costs and Benefits

Envision New Zealand

per annum to the kerbside collector, and at three CDS containers per week the contract impact financially of CDS is neutral.

If there are six CDS containers put out in the kerbside collections, then CDS would have a positive impact of reducing the contract payment by Councils to the contractor of $19.26 per household per annum. As an example this would equate to a positive impact (savings) for Auckland Council of $9.6 million per annum.

As well as direct savings in kerbside recycling costs, there will be additional savings to Councils and collectors through reduced operational costs of kerbside collections. This is because of the efficiency benefits associated with reduction in volumes collected due to trucks needing to return to base less for unloading. A halving in volume collected would improve efficiency by a factor of 1.5 because it increases the number of houses that can be visited by 50%.

4.4 COSTS AND BENEFITS TO LOCAL GOVERNMENT

Local governments would not incur additional costs through the introduction of CDL. However they would benefit in the following ways:

- Protected landfill space with 45,865 tonnes less beverage waste (750 million beverage containers) going to landfill, with significant refuse transport/disposal savings
- Potential savings to NZ ratepayers of between $26 million and $40 million per annum from refuse collection savings (based on bag rates of between $2 and $3 per bag)
- Reduced litter control costs including potential savings on servicing of public litter bins (through reduced servicing frequency and potential income from CDS containers)
- Reduced kerbside collection costs to councils, estimated at up to $19.26 per household per annum (see Table 8)
- New, largely self-funding recycling facilities (collection depots), which could collect materials in addition to beverage containers i.e. British Columbia sites also take in up to five different product stewardship categories including e-waste and most depots in South Australia receive at least one additional product or material.
- New local jobs and businesses creating stimulus for local economies

4.5 COSTS AND BENEFITS TO RECYCLERS

Recyclers will generate higher incomes by redeeming the deposit value of each container collected at the kerbside.

Recyclers will also reduce operational costs because they will be able to carry out collections faster. This could impact favourably on their ability to collect during off-peak times when there is less traffic congestion. Recyclers in South Australia are strong proponents of CDS in that State and are keen to refute the myth that CDL negatively affects recyclers.

In addition, higher prices would be received for kerbside and CDS-sourced recycled materials due to reduced contamination. Recyclers in South Australia report an increase in income of at least 10% and as high as 20% from the sale of CDS sourced materials.

The recycling industry will become a significant wealth creator for New Zealand generating new jobs, manufacturing products and increasing exports or substituting imports from the extra 45,865 tonnes of quality recovered materials available on the market.

The impact of light weighting on Recycler incomes:

In recent years, beverage producers have reduced the weight of containers in an effort to reduce production and transport costs. Whilst this is a good thing for producers, it has meant a significant increase in handling and processing costs for local authorities and their recycling contractors, whilst at the same time reducing their revenue. Light weighting also affects the way recycling data is reported. A CDS will restore recyclers’ incomes through the handling fees they will receive and this offsets the disadvantages of light weighting. Further analysis of the impact of light weighting on recycling revenues and data reporting can be found in Appendix Eight.
4.6 COSTS AND BENEFITS TO RETAILERS

No costs are attributed to retailers for storage space or labour in this report as handling fees will be sufficient to cover these costs. There will likely be set-up costs such as for installation of reverse vending machines. There are potential advantages to retailers through involvement in CDS such as increased customer loyalty, image protection etc.

Although in South Australia less than 1% of the collection centres are operated by retailers, the Hudson report indicates that participating retailers: “Identified costs of no significance in complying with CDL”51. The British Columbia experience provides further evidence that retailers have little to fear from CDS. For example the BC regulation requires retailers to take back bottles but (as stated in their 2014 Stewardship Plan) “Despite the presumed convenience of return-to-retail, a declining share of containers, currently around 7%, are returned through the retail system”. Two large recent independent studies in Europe demonstrated that shoppers returning containers for their deposits spend more than the average shopper52.

4.7 COSTS AND BENEFITS TO CONSUMERS/RATEPAYERS

Ultimately the consumer pays for the costs of the system through:

a) Choosing not to return containers for a refund – thus creating a pool of unredeemed deposits which in turn help pay system costs

b) Paying the administration fee (equivalent to the system cost per beverage unit) in the cost of the beverage

At an estimated net cost of $0.005 cents (half a cent) per container, the impact of administration fees on consumers would be negligible if industry chose to pass it on in the cost of beverages. There are however significant potential benefits to consumers including:

- A network of collection depots where they could drop-off other reusable and recyclable products and materials
- The potential to donate container refunds to charity
- The potential to collect containers to earn money
- Increased recycling options – not just kerbside collections
- Cleaner streets through less litter
- Fewer injuries or bike tyre punctures from broken glass
- More opportunities to participate in helping the environment
- New jobs and business opportunities

Potential refuse collection savings for ratepayers

A CDS is based on the user pays principle. Pre-paid or user pays refuse bags provided by many councils or waste operators are also based on the user pays principle. Assuming a ratio of 16 x 60-litre bags per cubic metre53, the 836,091 cubic meters of additional material recovered through CDS would amount to the equivalent of 13.8 million refuse bags not requiring disposal to landfill. This would amount to equivalent savings to the New Zealand public and ratepayers of between $26.7 and $40.1 million per annum (depending on the cost of the refuse bags) as table nine indicates.

<table>
<thead>
<tr>
<th>ADDITIONAL MATERIAL RECOVERED UNDER CDS</th>
<th>BAGS PER M3</th>
<th>BAG COST</th>
<th>POTENTIAL ANNUAL RATEPAYER SAVINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonnes M3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45,865</td>
<td>836,091</td>
<td>16</td>
<td>$2.00</td>
</tr>
<tr>
<td>45,865</td>
<td>836,091</td>
<td>16</td>
<td>$2.50</td>
</tr>
<tr>
<td>45,865</td>
<td>836,091</td>
<td>16</td>
<td>$3.00</td>
</tr>
</tbody>
</table>
4.8 COSTS AND BENEFITS TO VOLUNTARY AND SOCIAL SERVICE SECTORS

With hundreds of thousands of redeemable deposits available every week, the voluntary and social services sector will benefit significantly from the introduction of CDS. There are very few sources of ‘no-strings-attached’ funding for these groups in New Zealand. Funding is generally either linked to corporate sponsorships or must be sought from gambling-related sources which many groups are uncomfortable with, or from Government departments with onerous application processes.

CDS provides voluntary and social services groups with a reliable source of income from running collection depots that is neither a handout nor corporate sponsorship. Additionally some people will save up containers and give them to these groups as a way of donating to local causes – much as they used to in the old ‘bottle drives’.

Not-for-profit groups will also be able to set up community enterprises to operate local buy-back centres where people can redeem their deposits as the Scouts have done in South Australia, where they operate 10 bottle depots and associated recycling facilities.

4.9 COSTS AND BENEFITS TO THE MARINE ENVIRONMENT

Since the 2007 report, plastic bottles have come under increasing scrutiny because of their ability to float through stormwater systems into waterways. Because they break down into micro particles they are often ingested by small fish that mistake them for plankton. Also fish and birds can mistake plastic bottle tops for food as the photo below shows.

Plastic debris found in dead Albatross

The impact of plastic bottles on the environment is a challenging issue for the beverage industry as the alarming long-term impacts of their products on marine life including sea birds grow.

Because the financial incentive to recycle results in much higher return rates than voluntary schemes, a CDS is by far the most effective means of dramatically reducing the quantities of beverage container waste entering the marine environment.

Material recovered though CDS would amount to the equivalent of 13.8 million refuse bags not requiring disposal to landfill. This would generate potential savings to the New Zealand public and ratepayers of between $26.7 and $40.1 million per annum.
Voluntary product stewardship in New Zealand
5.0 Voluntary product stewardship in New Zealand

Over the last 20 years a complex range of industry initiated organisations and initiatives for dealing with packaging waste have emerged, partly as a direct result of the voluntary product stewardship environment favoured by successive governments.

However, these voluntary initiatives have done little to slow the overall quantity of packaging materials, including beverage containers, going to landfill or entering the litter stream and the marine environment. An outline of some of these organisations and initiatives follows:

**THE PACKAGING COUNCIL OF NEW ZEALAND**
In the early 90s there was public outcry at the introduction of single use beverage containers. This outcry was informed and fuelled by international movements opposed to the rise of beverage litter. Simon Upton, the then Minister for the Environment, challenged the packaging industry to do something about the problem.

In response to this challenge, the Packaging Council of New Zealand (PACNZ) was formed and in 1996 it signed the first voluntary Packaging Accord with the Government. Local Government New Zealand and the Recycling Operators of New Zealand (now defunct) were co-signatories.

A second five-year accord was signed in 2004. Discontent with the outcomes of both accords by many local authorities, recyclers and community groups resulted in increasing calls for mandatory measures to properly address packaging waste.

**THE GLASS PACKAGING FORUM**
The Glass Packaging Forum was established in 1996 to address New Zealand’s lacklustre glass recycling performance and “to protect its members from mandatory product stewardship schemes being introduced through legislation”.

In spite of extensive promotion (and a significant budget provided by its members), only 7,403 tonnes of the 165,178 tonnes of glass recycled between 2011 and 2012 was due to projects or funding from the Glass Packaging Forum’s scheme.

**PUBLIC SPACE RECYCLING SCHEME**
The Public Space Recycling Scheme is a programme of the Glass Packaging Forum. Its stated goal is to “Recycle 140 million cartons, cans, glass and plastic bottles each year; and reduce litter volume by 10% by increasing the number of recycling bins in public places by 300%.” It is not clear from their website if this is additional to the amount of recycling already occurring in New Zealand. Their website www.recycling.kiwi.nz has various examples of bin types and news stories about recycling at events as well as the list of various sponsors.

**THE PACKAGING FORUM**
The Packaging Forum is a new organisation set up in 2015 to advocate for its members. It operates two accredited voluntary packaging product stewardship schemes - the Glass Packaging Forum and the Public Space Recycling Scheme outlined above. It also has a licensing agreement with the government to use and promote the Love New Zealand brand.

The Packaging Forum is currently working on the development of a voluntary Product Stewardship Scheme for plastics starting with a programme for the recovery of “soft” plastic bags to be collected from the consumer. This initiative is no doubt in response to increasing calls recently in the media for a ban on single use plastic bags in order to reduce litter, waste and effects on the marine environment.
Voluntary initiatives have done little to slow the overall quantity of packaging materials, including beverage containers, going to landfill or entering the litter stream and the marine environment.

LOVE NEW ZEALAND
Love New Zealand is the brand for public space recycling in New Zealand owned by the New Zealand Government and licensed to the Packaging Forum. Under the licensing agreement with the Ministry for the Environment, The Packaging Forum and members of their accredited product stewardship schemes are eligible to use the Love NZ brand in accordance with the style guide with prior written consent from the MFE.

KEEP NEW ZEALAND BEAUTIFUL
Keep New Zealand Beautiful Society Inc. (KNZB) was established under the New Zealand Litter Act 1979. KNZB is a member-based organisation that runs a range of programmes in communities around the country. Local projects often receive project-funding grants from their local Councils and/or Community Boards.

Keep New Zealand Beautiful adopted a policy of supporting beverage container deposits at its Annual General Meeting at Henderson in 2007. In spite of this policy, KNZB submitted against CDS for Auckland Council’s Waste Management and Minimisation Plan in 2012. Intense lobbying by industry representatives resulted in KNZB dropping its policy to support CDS at its 2014 Annual General Meeting.

THE COCA-COLA FOUNDATION
The Coca-Cola Foundation has a Beverage Container Recycling Community Grants scheme, which is currently managed by KNZB. The scheme provides financial support to individuals, communities and organisations for projects, which make long-term improvements to the recycling of beverage containers. Coca-Cola is well known worldwide for its opposition to CDS.

COCA COLA AMATIL YOUNG NEW ZEALANDER OF THE YEAR AWARD
On the 1st March 2013, a press release from Coca-Cola Amatil NZ Ltd, announced that Sam Judd, Co-Founder and CEO of Sustainable Coastlines was made the Coca-Cola Amatil Young New Zealander of the Year at an awards presentation in Auckland the previous evening. In a 2012 article in the New Zealand Herald, Sam was critical of Coca Cola and its products that end up in our “beaches, drains and landfills”.

ENVIRONMENTAL BEVERAGE ACTION GROUP (EBAG)
EBAG was a cross-sector working group comprised of brand owners and retailers, manufacturers of packaging, Local Government New Zealand, The Packaging Council, Ministry for the Environment and Recycling Operators of NZ.

EBAG seems to have been initiated in support of the 2004 Voluntary Packaging Accord and submitted against mandatory product stewardship and CDL when the Ministry for the Environment called for submissions on their 2005 Product Stewardship and Water Efficiency Labelling Discussion Document. If they were in fact part of the group in 2005, the Ministry for the Environment was effectively submitting on its own discussion document.

A search on the Internet and inquiries with Coca Cola suggests that EBAG no longer exists.

5.1 A COMMON THEME – OPPOSING THE INTRODUCTION OF A CDS
The desire to keep container deposits out of New Zealand is a common theme amongst all of the above groups or initiatives. For example the Glass Packaging Forum states on its website; “A voluntary glass packaging product stewardship scheme is the best way to protect the interests of members in the face of continued calls on government for mandatory product stewardship schemes or the introduction of container deposit legislation enabled through the legislation”.

The InCENTive to Recycle
5.2 MONEY SPENT ON VOLUNTARY RECYCLING INITIATIVES FOR BEVERAGE CONTAINERS

Government and industry spend large amounts to support voluntary measures for reducing packaging.

- Government costs
  The New Zealand Government has spent significant amounts of public money supporting voluntary product stewardship for packaging since the first Packaging Accord was signed in 1996. In 2008 Government allocated $4.6 million to install and service 600 public-place recycling bins throughout New Zealand. This amounted to a cost of $7,666 per bin. Between 2010 and 2012, Government allocated grants for beverage container recycling totalling $2,444,000 (See Appendix Six for details).

- Local Government costs
  Local government and ratepayers tend to carry the load when it comes to the considerable costs associated with installing, servicing and maintaining public space recycling facilities. These ongoing costs do not stop after the first year’s grant has been spent, but are perpetual. Some local authorities also have grant schemes and some of these grants may go to groups promoting recycling in public spaces.

- Industry costs
  The Waste Minimisation Fund, administered by the Ministry for the Environment, usually requires recipients to contribute to the total cost of the project, so the amounts spent on these initiatives is likely to be higher than the grant allocations would suggest.

Additionally, Industry pays to belong to groups such as the Packaging Council of New Zealand, the Glass Packaging Forum and the Packaging Forum. The Glass Packaging Forum receives levies on the basis of $3.90 per tonne for all glass consumed in New Zealand which raises hundreds of thousands of dollars each year for projects but not for research into mandatory product stewardships schemes like CDS.

A CDS in New Zealand could be set up at close to zero cost to government and with considerable savings and benefits for local authorities. However, funds from the landfill levy could be used to assist in setting up the system. Managing Agency surpluses could also be used to provide seed funding for the establishment of return depots.

5.3 HOW WELL ARE VOLUNTARY PROGRAMMES PERFORMING?

The voluntary efforts outlined above, have not resulted in the high recycling outcomes that are achieved in jurisdictions with CDS. The Ministry for the Environment’s most recent data on the composition of waste in New Zealand is for the 2007-2008 period.

It’s difficult to find clear information on quantities going to landfill because packaging is not identified as a separate category. Packaging would though make up significant proportions of plastic (8%), glass (4%) and smaller proportions of paper (7%) and metals (4.5%) categories.

An MFE commissioned report, prepared by Waste Not Consulting, showed proportions of potential packaging materials in domestic waste with plastics (12.1%), glass (3%), paper (14%) and metals (2%) – a total of 31% in spite of more than 90% of New Zealand homes having access to kerbside collection or drop-off facilities.

Kerbside recycling schemes set up and funded by local authorities have been highly successful at recovering containers drunk at home. It is clear though that voluntary recycling schemes for containers consumed away from home have not lifted recovery rates in spite of the public funds and resources expended.

Since 1994, PACNZ (the Packaging Council of New Zealand) has compiled annual “mass balance data” to track recovery levels and trends of paper and packaging waste sent to landfill.
The InCENTive to Recycle

5.0 Voluntary product stewardship in New Zealand

Graphs from the most recent mass data entry on their website show that recycling growth has remained roughly in line with consumption growth.

The mass balance data is based on information provided by the Packaging Council to the NZ Government as part of PACNZ’s previous reporting requirements under the 1996-2000 and 2004-2008 Packaging Accords. Enquiries with PACNZ found that the data was not independently audited in which case the Government was taking industry’s word for any packaging reduction successes claimed during the voluntary Packaging Accords. The following table from the Packaging Council of New Zealand’s website shows mass balance consumption and collection data by category for 2010.

If paper and steel, (materials not collected as beverage containers), tonnages are deducted, the averaged recovery rate claimed by PACNZ stands at around 46%. This figure does not include beverage containers such as Tetra-Paks that would be captured in a container deposit scheme.

Additionally the collection rate does not take into account material rejected because of contamination or the large amount of glass that’s not recycled back into glass but instead put into roads. The real recovery rate then is likely to be much lower. A more credible assessment would be somewhere between 30% and 35% which is in line with the average recycling rate of non CDS states in the US.
The following graph taken from the Glass Packaging Forum shows that glass recycling has largely only increased in line with increased levels of consumption but once again it does not identify the true ‘bottle to bottle’ recycling rate.
### MASS BALANCE CONSUMPTION AND COLLECTION DATA BY CATEGORY FOR 2010

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>CONSUMPTION (TONNES)</th>
<th>COLLECTION (TONNES)</th>
<th>COLLECTION AS % OF CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>7,716</td>
<td>3,712</td>
<td>48%</td>
</tr>
<tr>
<td>Glass</td>
<td>251,664</td>
<td>166,576</td>
<td>66%</td>
</tr>
<tr>
<td>Paper</td>
<td>815,300</td>
<td>483,900</td>
<td>59%</td>
</tr>
<tr>
<td>Plastics</td>
<td>156,348</td>
<td>38,459</td>
<td>25%</td>
</tr>
<tr>
<td>Steel</td>
<td>13,536</td>
<td>9,128</td>
<td>68%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,244,564</strong></td>
<td><strong>710,865</strong></td>
<td><strong>56%</strong></td>
</tr>
</tbody>
</table>

The industry-sourced data (even if it could be verified independently) shows that in spite of nearly 20 years of voluntary measures, beverage container recycling rates have remained stubbornly low. This compares unfavourably with countries that have efficient CDL programmes where recovery rates consistently fall within the 80% to 95% range as shown in the table above.

The purpose of any recycling or product stewardship scheme is to ensure that the maximum possible quantities of a certain product or material are recovered for reuse or recycling. There is no evidence worldwide that voluntary schemes can achieve anything close to the recycling rates that mandatory CDSs do.

In addition, other environmental and economic benefits outlined elsewhere in this report add to the case for a CDS. The careful observer must look beyond the various initiatives, organisations and quasi-organisations that have been set up in recent years, (some of which are quite open about the fact that they exist partly to ensure that mandatory measures for packaging recycling are not introduced), to find data that enables a fair comparison to be made between voluntary product stewardship schemes and a mandatory CDS.

### 5.4 WHY VOLUNTARY MEASURES UNDER-PERFORM

Voluntary measures for beverage container recycling tend to falter when recovery rates reach around 30% to 40%. Reasons for this low performance include:

- **The Limits of Goodwill**
  Voluntary measures cannot break through a certain level of participation and performance in terms of recovery rates because they rely on the goodwill of the public to do the right thing. Goodwill has limits that cannot match the lure of the financial incentive built into a CDS.

- **Freeloading**
  Freeloading is a typical feature of voluntary schemes. Freeloading is where some producers gain the benefits of voluntary agreements but do nothing to support them. For example the Glass Packaging Forum only covers 80% of businesses that manufacture or use glass packaging in New Zealand. Freeloading tends to reduce overall compliance because of the unfair advantage in the market freeloaders can gain through not contributing financially to or participating in the scheme.

- **Transfer of Costs to Local Government and Ratepayers**
  The packaging industry promotes its role in product stewardship, but a large proportion of the costs of recycling their products are transferred to local government and ratepayers who fund litter abatement measures, and kerbside and public space recycling schemes. Government also pitches in significant amounts of public money for the costs of public space recycling as well as other projects related to recycling beverage packaging that could be more effectively spent elsewhere.
5.5 NOT ALL LARGE BEVERAGE PRODUCERS OPPOSE CDS

Some initiatives by industry have clearly been initiated to stave off the introduction of mandatory product stewardship, but not all beverage producers oppose CDS.

Diageo, the world’s largest alcoholic beverages brand owner (Smirnoff, Guinness, Baileys to name a few) produced a report for the Western Australian Government’s 2006 enquiry into CDL saying, “The government of Western Australia wants to reduce the beverage containers in waste and litter. Research suggests that, of the range of interventions available, container deposit/refund systems are consistently the best option both in terms of recovery rates and cost of operation and Diageo supports their introduction.”

5.6 CALLS FOR CHANGE

There have been ongoing calls for the New Zealand government to adopt mandatory measures to address packaging waste since the first Packaging Accord was signed, including from the Parliamentary Commissioner for the Environment. In the preface to its 2006 report, *Changing Behaviour: Economic instruments in the Management of Waste*, it stated.

*The WMA (Waste Minimisation Act) promotes product stewardship and makes provision for the introduction of voluntary and mandatory schemes. However, to date, no mandatory schemes have been introduced and voluntary schemes (successful as some have been) are limited in their effectiveness.*

*It has been shown worldwide that economic instruments in all their forms, including taxes, levies, charges, tradable permits, deposit schemes, subsidies, and credits, are effective policy tools for changing behaviour.*

*Using these tools to improve waste management has not been properly considered in New Zealand, although it is common in other OECD countries.*

*In examining how well New Zealand uses this type of tool, the report reveals that we seem to be somewhat fixated on voluntary measures, and that a number of barriers exist to using economic instruments (Parliamentary Commissioner for the Environment 2006).*

*The report also reveals that barriers have arisen out of deliberate policy choices, such as those taken by the Ministry for the Environment. The Ministry has failed to pursue some key actions involving economic instruments, which were agreed to in 2002 as part of the NZ Waste Strategy.*

*The five recommendations to the Minister for the Environment in this report aim to ensure that economic instruments become part of the policy mix when dealing with environmental issues such as the management of waste.*
Conclusions and Recommendations
6.0 Conclusions and Recommendations

CONCLUSIONS

After 20 years of voluntary measures, New Zealand’s beverage container recycling rates remain low (estimated at less than 40%) compared to states with CDS that routinely achieve rates of between 85% and 95%.

At least 45,865 tonnes (over 830,000 cubic metres by loose volume) of beverage containers are discarded into the litter stream, waterways and landfills each year. Compacted at a four to one ratio in landfill, these containers would take up more than 160,000 cubic metres of space each year.

Under a CDS, these containers would be recycled, creating potentially hundreds of new businesses, up to 2,400 new jobs and cost savings for local Authorities.

Ratepayers would reap potential savings of between $26million and $40million per annum from refuse collection savings (based on bag rates of between $2 and $3 per bag).

Local government is an important voice on this issue, as they currently pay the costs of cleaning up, recycling, or disposing to landfill, products that industry puts into the market without providing the financial means to properly recycle them.

An ‘eco-system’ of initiatives, programmes, research and public relations set up by the beverage and packaging industries have helped them to influence Government policy to ensure that product stewardship for packaging remains voluntary.

These interests have also accessed significant amounts of public funding cover ($7 million since 2008) which has helped them to exert influence throughout the recycling industry and among councils and not-for-profits in their efforts to maintain the status quo.

Territorial authorities, recyclers, environmental groups and charities have been calling for government to lead on this issue of high public concern. This is confirmed by the responses to Envision’s recent survey of territorial authorities (Appendix four.)

CDS is a market-based instrument that is viable, effective and efficient at achieving high return rates for beverage containers at no cost to government. The net system cost of 0.05 cents per container is minor and shared between the producers and consumers of beverages. As such, CDS is a true example of Product Stewardship or EPR.

Public space recycling bins on the other hand are by far the most expensive way to recycle beverage containers and the costs fall mainly on local authorities. Where employed, they should be limited to a few high profile high foot traffic areas, such as in busy tourist destinations.

CDS co-exist well with existing kerbside recycling schemes and make them cheaper to operate for local authorities and ratepayers.

There is nothing stopping New Zealand from adopting a well-proven world class recycling system for beverage containers.

The large beverage industry players in New Zealand are global companies, accustomed to regulations in many countries requiring them to take responsibility for their waste. CDS is not new to them. They know how to operate under a CDS, but will only do so in New Zealand if required by Government. If not, they will continue to lobby extensively to maintain voluntary measures as they have done so all over the world.

New Zealand should no longer continue with voluntary measures after 20 years of poor outcomes.

It is time for change.
PARTIES THAT WILL BENEFIT FROM A NATIONAL CDS INCLUDE:

- Taxpayers who have had poor returns for their investments in industry run voluntary schemes
- Local authorities and rate payers who currently bear the costs and impacts of cleaning up, recycling or disposing of beverage containers
- Not-for-profit organisations and environmental groups, because of the potential social and environmental outcomes and significant new fundraising opportunities
- Businesses and recyclers will be able to create new employment, and earn greater income in order to grow the industry
- Proactive packaging and beverage companies that genuinely want to be part of the solution to the waste and litter that their products create
- Landfill owners who currently receive over 40,000 tonnes of beverage containers per annum, for which they lose at least 160,000 m3 of landfill space, due to the low weight to volume compaction ratio of beverage containers
- The person in the street who will be rewarded by the financial incentive to recycle
THE KEY RECOMMENDATIONS OF THIS REPORT ARE THAT:

1. Government declare beverage containers a priority product under the Waste Minimisation Act 2008 with a national recovery target of 85%.

   To achieve the 85% target, Government would require the establishment of a national Container Deposit Scheme (CDS), requiring producers to put a minimum refundable deposit on beverage containers to help ensure they are recycled at rates consistent with other OECD countries.

2. Concerned stakeholders work together to make the case nationally of the direct and wider benefits of a CDS for New Zealand with a view to implementation by 2017.
Appendices
Although CDSs operate on similar principles, they are influenced by local policy, infrastructure, industry and demographics. The most important difference between CDS programmes is probably that of who is responsible for running them - government or industry.

Two case studies of high performing government-overseen and industry-run CDS programmes that have application to New Zealand follow (Appendices One & Two). The reasons for their inclusion are:

**SOUTH AUSTRALIA**
A Government-overseen programme
- Similar legislative and cultural environment to New Zealand
- Similar urban population density and demographics
- Similar ‘tyranny of distance’ issues
- CDL operating alongside the (voluntary) National Packaging Covenant

**BRITISH COLUMBIA**
- An Industry-run, government audited programme
- Similar population size (4.1 million)
- Similar legislative and cultural environment to New Zealand
- Similar urban (e.g. Vancouver-Auckland) and physical environments
- Similar ‘tyranny of distance’ issues
- CDL operating within an overarching Product Stewardship framework

**NORWAY**
The Norway example (Appendix Three) has been included for contrast. It demonstrates a different approach to achieving a national CDS because while it is not mandatory for beverage producers to participate, Norway achieves a high level of participation by beverage companies and a 95% recovery rate. This is achieved through the application of disincentives for non-participation.

Summaries of other CDSs operating around the world can be found on the Container Recycling Institute’s website, www.bottlebill.org,
Appendix One: South Australia Case Study

**LAW/REGULATION:**
Container Deposit Legislation was first implemented in 1975 and was later integrated into the Environment Protection Act of 1993. Under this Act a wide range of beverage containers sold in South Australia are required to carry both a refundable deposit and approved refund markings.

**PURPOSE:**
To reduce beverage litter, achieve higher resource recovery rates, and educate the community on recycling.

**ADMINISTRATION:**
The South Australian Environmental Protection Agency (EPA) administers the return system. The EPA manages the approval process for manufacturers and distributors whose beverage containers are subject to CDL. Refund markings, commonly referred to as the deposit statement, carried on beverage containers are also approved by the EPA. In the CDL approval process, beverage manufacturers and distributors must demonstrate that they have made funds available to ensure a satisfactory collection system for their containers. This includes the payment of refunds to consumers, payments to collection depots, and the administrative costs associated with the collection arrangements.

**BEVERAGES COVERED BY CDL: NON-ALCOHOLIC**
In all container types up to and including 3 litres:
- Carbonated soft drinks
- Non-carbonated soft drinks
- Water (plain/still/carbonated)

In all container types of less than 1 litre:
- Pure fruit juice (at least 90% of which is fruit or vegetable juice or a mixture of both)
- Flavoured milk

**ALCOHOLIC**
In all container types up to and including 3 litres:
- Beers/ales/stout
- Wine based beverages (wine cooler and similar beverages)
- Spirit-based beverages
- Alcoholic beverages (derived from the fermentation of fruit)

**AMOUNT OF DEPOSIT:**
10-cents for containers that are refundable at collection depots, 10-cents for containers, which are refundable at retailers (very few companies choose the return-to-retail option; 99.9% of all container redemption in SA is done at collection depots).

Beverage manufacturers/distributors are required under the Environment Protection Act to seek Container Labelling Approval from the EPA. This not only ensures consumers are aware a refund is available on the container, but ensures the industry is responsible for the financial underpinning of the entire collection system.

All beverage containers subject to the CDL in South Australia must display approved markings that show how to claim the refund:
- ‘10c refund at points of sale when sold in SA’ means that the container must be returned to a retailer who sells the beverage in that container
- ‘10c refund at collection depots when sold in SA’ means that the container must be returned to a collection depot.

**RECOVERY RATES:**
- 85% of non-refillable glass bottles, compared with 36% nationally.
- 84% of cans compared with 63% nationally.
- 74% for PET compared with 36% nationally.
- Liquid Paperboard, a recent inclusion, has a return rate of 40% and is increasing.
**COLLECTION DEPOTS:**
Consumers can drop containers off and pick up their refunds at any of approximately 120 collection depots around South Australia. Local authorities, small businesses and community groups such as the Scouts run the depots. All collection depots must be approved under the Environment Protection Act. 

**SUPER COLLECTORS:**
The super collectors act as agents for the beverage industry. They:
- Coordinate the return of empty containers from collection depots
- Reimburse depots for refunds paid to consumers and pay depots a handling fee
- Sell the containers to material recyclers and processors for recycling, reuse or recovery of energy.

The super collector in turn claims the deposit and handling fee from the beverage filler (producer).

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10c

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KERBSIDE PROGRAMME:
Nearly all of South Australia’s population has access to a kerbside collection programme.

STEP 1: BEVERAGE PRODUCER OR FILLER
Beverage Producer or Filler supplies beverages to retailers. The 10-cent deposit and an agreed handling fee are included in the wholesale price of the beverage. The deposit and handling fee is retained by the Beverage Producer or Filler or their agent, who operates as the Super Collector. This is held until the deposit containers are returned to them to be recycled.

STEP 2: RETAILER
Retailer supplies consumers. The 10-cent deposit and handling fee is included in the retail price paid by the consumer for the beverage.

STEP 3: CONSUMER (OR COMMUNITY GROUPS)
Consumer returns containers to collection depot and collects 10-cent deposit.

STEP 4: COLLECTION DEPOT
Depot sorts the containers by material and responsible agent (e.g. glass, aluminium, PET) into containers for return to the Super Collectors.

STEP 5: SUPER COLLECTORS
Once containers are sorted, they are sent back to one of the four Super Collectors for the recycling of material and auditing. Super Collectors pay the Collection Depot back the 10-cent deposits, which they paid out to the consumer in step 3, plus an agreed handling fee.
Appendix Two: British Columbia Case Study

Law/Regulation: CDL was initially enacted in British Columbia in the 1970 Litter Act. In response to ongoing local government concerns at the increase in beverage container waste, the province enacted the Beverage Container Stewardship Program Regulation in 1997. The regulation established the goal of a minimum 85% recovery rate and required that redeemed containers be either refilled or recycled and no containers recovered by the system could be landfilled or incinerated. This regulation has now been repealed and most of its provisions are now in Schedule 1 of the Recycling Regulation.

The regulation establishes a system where beverage brand owners are given the responsibility of designing and managing the system and Government the responsibility of setting environmental performance standards, monitoring results, and making changes if performance standards are not met. The programme is part of British Columbia’s Industry Product Stewardship management system for product and packaging waste.

Administration: Brand-owners are responsible for submitting a plan for recycling their containers, which the Environment Ministry must approve. Brand-owners can appoint a third party agency to do this on their behalf - which has been the choice of all beverage brand-owners to date.

The recycling programme for all non-alcoholic, plus wine, spirit, and non-refillable cooler and beer beverage containers is managed by Encorp Pacific (Canada). Brewers Distributor Ltd manages the programme for refillable glass beer containers and beer aluminium cans. These agencies manage all funds, contracts with depots, transporters and processing centres. They also manage promotion / education, research & development and provide technical assistance. They submit annual reports to the Environment Ministry on deposits charged and refunds paid and recycling rates.

Oversight: Public oversight is the responsibility of government. Administration of the regulation is carried out by ministry staff (1/2 FTE) who monitors the performance of the programme (through annual reports from the container recycling agencies).

The Environment Minister receives recommendations from ministry staff and the public. Consultation with and responding to stakeholders, including system participants and recycling advocates, is a mandatory element of submitting and renewing stewardship plans every five years.

Funding: The programme is completely industry-funded. Some brand-owners absorb the cost of the programme in product prices while others pass the cost on down the supply chain and to the consumer in the form of discrete non-refundable ‘recycling fees’ that are added at the point of sale.

The programmes are funded from three sources of revenue: unredeemed container deposits, revenue from the sale of recycled container materials and industry recycling fees (if required). All funds are managed by the container recycling agencies.

Minimum deposit/refund amounts are specified in the regulation. Authorised depots must pay consumers the full refund and all unredeemed deposits stay in the programme to offset costs. Local authorities or their contractors return refundable containers from kerbside collections to an authorised depot to receive refunds.

Recycling fees are not established in the regulation. They form part of the non-alcoholic beverage industry’s policies and are charged by container type and size to reflect the shortfall between revenue and expenses for managing each particular container.
Other beverage sectors have chosen to include recycling fees in the price of the product, rather than require retailers to separately disclose this portion of the product price.

**NON-BEER BEVERAGE CONTAINERS**
The return system for all beverages excluding beer aluminium and refillable glass containers is managed by Encorp Pacific (Canada), a not-for-profit stewardship corporation established by the soft drink and grocery industries. Encorp Pacific represents over 200 companies and the number of individual product types now listed is over 7,000.

Encorp operates on the basis of several principles:
- To develop and operate a system which provides consumer-friendly and convenient return points throughout the province
- To manage the system in a cost-effective manner that has the lowest impact on consumer shelf prices
- To run a cost-based system in which each container type pays its own costs with no cross-subsidisation
- To divert used products from landfill and incineration
- To find useable end products which maximise the value of the recovered commodities
- To treat all brand owners equitably

It manages the process of setting up the depots and providing the equipment and expertise for collecting containers, paying out deposits, processing containers and marketing the scrap materials. Encorp Pacific keeps unclaimed deposits and revenue from recovered materials to finance the costs of operating the recycling system. A handling fee on certain products is also charged.

Depot operators register with Encorp Pacific and are spaced a sufficient distance apart so they do not cannibalise each other’s territory. Currently retailers must, by law, take back what they sell, up to 24 containers per person per day.

The programme has been cost-effective. Encorp Pacific is a not-for-profit organisation which sets a target range of reserves and operates annually with a surplus or deficit to maintain reserves within the target range.

**Beer containers:** An independent, return-to-retail system operates for refillable beer bottles and beer aluminium. These are recovered for full deposit at liquor stores and approximately 40% of depots are licensed by the stewardship agency.

Containers returned to unlicensed collection depots are discounted by the depot operator who then returns the bottles to the brewers. It is estimated that 65% of these containers are returned through the depot system.

**Containers covered:** All ready-to-drink beverages except milk, milk substitutes and meal replacements.

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### NON-ALCOHOLIC BEVERAGE CONTAINERS

<table>
<thead>
<tr>
<th>BEVERAGE TYPE</th>
<th>HANDLING FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium cans, Bi-metal &lt; 1L, tetrapak/gable top &lt; 500ml</td>
<td>3-7 cents</td>
</tr>
<tr>
<td>Plastic &lt; 1L</td>
<td>5 cents</td>
</tr>
<tr>
<td>Bi-metal &gt; 1L, Tetra Pak/Gable top&gt;501ml, glass</td>
<td>6-7 cents</td>
</tr>
<tr>
<td>Plastic &gt; 1L</td>
<td>8 cents</td>
</tr>
<tr>
<td>Beer: 21-36 cents/doz. depending on sorting done</td>
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</tr>
</tbody>
</table>

### ALCOHOLIC BEVERAGE CONTAINERS

<table>
<thead>
<tr>
<th>BEVERAGE TYPE</th>
<th>HANDLING FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 litre and under</td>
<td>5 cents</td>
</tr>
<tr>
<td>Over 1 litre</td>
<td>20 cents</td>
</tr>
</tbody>
</table>

Beer: 21-36 cents/doz. depending on sorting done
AMOUNT OF DEPOSIT

Handling fees: Encorp Pacific charges a handling, or recycling, fee on products, which reflects its cost to recycle. The fee was previously included in the purchase price, but is now shown separately to show consumers the price of recycling\(^7\). Grocers do not receive the handling fees as Encorp Pacific provides container transport.

Collection depots: Beverage containers can be returned either to collection depots or retailers. 332 grocers and 190 government liquor stores have agreements with Encorp Pacific to have containers returned to them collected by Encorp. Retailers must still take back all containers they sell. Over the past 10 years the percentage of non-alcoholic containers returned to depots (rather than returned to retail) has increased 45% to more than 90%.

RECOVERY RATES

In the most recent reporting year, 2014, the following recovery rates were reported:

- Non-alcoholic beverages: 76.5% (includes aseptic/polycoat containers which had been in the system only three months)
- Wine / spirits: 91.9%
- Beer: 95%

The overall recycling rate for non-brewer stewarded beverages is now 79.1%.

KERBSIDE PROGRAMME

About 80% of the population has access to multi-material kerbside collections and/or 173 collection depots around the province.

REVIEW OF THE BRITISH COLUMBIA CDS

In August 2015, just prior to the completion of this report, the Container Recycling Institute (CRI) released a review of the British Columbia CDS operated by Encorp. The report is a thorough and detailed overview of the BC system and complimentary regarding performance and outcomes. However, it does call into question some features, particularly the high cost of some handling fees within the BC system. Scott Fraser, the CEO of Encorp believes that some the criticisms are largely incorrect and has written a response letter outlining why. The review by CRI and Scott Fraser’s response letter can be found on CRI’s website:

Appendix Three: Norway Case Study

The Norwegian deposit/refund system shares the main features of the South Australian and British Columbian models but is also different in a number of ways. One example is that it is not mandatory for producers and importers to join the Norwegian CDS.

If they want to, they can market products in non-refillable beverage containers in Norway. However, if they do not sign up, they will not be entitled to a reduction in the environmental fee which has to be paid for each and every beverage container sold in Norway.

Additionally, in spite of Norway’s successful deposit system for single use beverage containers, a large proportion of beverages are also sold in refillable bottles.

**LAW/REGULATION**

The system was enacted in 1999 under the Product Control Act and Regulations relating to the recycling of waste and implemented also in 1999.

**ADMINISTRATION:**

The system is operated by Infinitum which is owned by a consortium made up of the Federation of Norwegian Food and Drink Industry (7.5 %), the Grocery Manufacturers’ Service Office (7.5 %), the Norwegian Association of Wholesale Grocers (33.5 %), Coop Norway (15 %), the Norwegian Federation of Petrol Dealers (1.5 %), and the Norwegian Brewers’ Service Office (35 %). The company was also granted the exclusive right to manage the deposit/refund system for empty non-refillable containers after the system was approved by the Norwegian Pollution Control Authority.

In 2014 the name of the system operator was changed from Norsk Resirk to Infinitum. Inspired by the infinite number of times you can recycle a bottle or can in the deposit scheme.

Producers or importers who have not signed up with Infinitum will pay a fixed fee of NOK 0.97 (EUR 0.08) plus an environmental fee of NOK 4.74 (EUR 0.39) per can and NOK 2.85 (EUR 0.23) per plastic bottle.

Producers and importers who sign up with Infinitum will be entitled to a reduction in the above-mentioned environmental fee as follows:

If the return and recycling rate of the used beverage containers is below 25%, the producer or importer will receive no reduction in the environmental fee. If the return and recycling rate is above 95%, the environmental fee is reduced to zero. If the return and recycling rate is between 25% and 95%, the environmental fee is reduced linearly. This scheme motivates producers and importers to sign up with Infinitum and almost all do.

**Oversight:** Oversight is carried out by the Norwegian Climate and Pollution Authority because of its role in litter prevention/reduction.

**Funding:** The Norwegian system is funded by a combination of material revenue, unredeemed deposits and administration/ environmental fees

**System Target:** 95%

**Containers covered:** Beer, carbonated beverages, wine, liquor, and non-carbonated beverages except for milk products, fruit and vegetable juices, dietetic products exclusively for babies.

**Collection system:** Return to Retail with about 3,862 RVMs (reverse vending machines) (95% automated / 5% manual).

**Recovery rates:** Total recovery rate for all containers + 95%

**AMOUNT OF DEPOSIT**

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal &lt; 500ml</td>
<td>13 Euro</td>
</tr>
<tr>
<td>Metal &gt; 500ml</td>
<td>32 Euro</td>
</tr>
<tr>
<td>Plastic &gt; 500ml</td>
<td>13 Euro</td>
</tr>
<tr>
<td>Plastic &gt; 500ml</td>
<td>32 Euro</td>
</tr>
</tbody>
</table>

**HANDLING FEES**

<table>
<thead>
<tr>
<th>Method</th>
<th>Handling Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Collection</td>
<td>Metal: 0.05 NOK (0.0063€), Plastic: 0.10 NOK (0.013€)</td>
</tr>
<tr>
<td>RVM without compaction</td>
<td>Metal: 0.05 NOK (0.0063€), Plastic: 0.10 NOK (0.013€)</td>
</tr>
<tr>
<td>RVM with compaction</td>
<td>Metal: 0.20 NOK (0.025€), Plastic: 0.25 NOK (0.031€)</td>
</tr>
</tbody>
</table>
Appendix Four: Envision’s Previous Packaging Related Work

Envision has provided consulting services to the recycling industry, councils and government for over 15 years. Our work links waste strategies with local economic development strategies and helps communities to create employment and new business opportunities from waste. Our packaging related work is summarised below:

‘Getting Serious About Packaging Waste’ (2004). This report was provided to signatories to the first Voluntary Packaging Accord in an effort to delay the signing of the second Accord, as a full review of the performance of the first accord had not been carried out. At the same time we brought the former President of the Australian Local Government Association, Peter Woods, and the Environmental Strategy Manager for the Local Government Association of NSW, Robert Verhey, to New Zealand to run Packaging seminars in Auckland and Wellington.


“Employment Opportunities from Packaging Waste” (2005). An evaluation of four different international packaging recycling programmes to determine the employment potential of each for New Zealand.


“Outline of a Beverage Container Deposit Refund System for Fiji” (2012). A report outlining the overall system design and key features for implementation of a Beverage Container Deposit system for the Fiji Government.

“Product Waste: Who Pays?” (2010). A resource of 43 examples of Product Stewardship from around the world, showing how different countries are attempting to reduce both product and packaging waste.

Study Tours 2005 - 2015. Envision has taken four study tours to Australia (New South Wales, Victoria and South Australia) to look at best practice resource recovery and waste minimisation systems, including South Australia’s container deposit system. Tours have included representatives from Government, Local Authorities and Industry. Further study tours are planned for 2016 both within New Zealand and other countries.


Co-sponsorship of public events for Captain Moore (2012) Captain Moore is often referred to as the man who first discovered the Great Pacific Garbage Patch, huge gyres of floating plastic debris that are accumulated in the Pacific by tidal action. Envision co-sponsored (with the Sir Peter Blake Trust), two speaking and book signing events for Captain Moore at Paper Plus Takapuna and the Maritime Museum at the Viaduct Basin Auckland.
Appendix Five: Review of conversion ratios (tonnes per cubic metre and bags per cubic metre) used in this report

This report uses a weight to volume conversion ratio of 4:1 to determine the amount of landfill space that a tonne of mixed beverage containers would use. It also uses a conversion ratio of 30 (60 litre rubbish bags) to one cubic metre.

Landfill design consultant, Geoff Johnston, CEO of One World Environmental Solutions, was asked to give an independent review of these conversion ratios as follows:

LOGIC FOR COMPACTION RATES; VALIDATION OF 4:1 RATIO.
In reviewing the compaction ratio, the following are the standard KPIs used in this review:

- Full compaction rates in a landfill ~ 1,000 to 1,200 kgs per cubic metre (m3)
- Compaction rates in a collection vehicle ~ 350 to 400 kgs per m3 for waste
- Compaction rates in a collection vehicle ~ 120 to 200 kgs per m3 for co-mingled recycling.
- The CDS material sits at the lower end of this.
- Loose co-mingled recycling is ~ 68 kgs per m3 (i.e. 4.25 kgs per bag)
- Loose CDS recycling is ~ 54 kgs per m3 (disproportionately heavy because of glass) (i.e. 3.375 kgs per bag)

These numbers make sense with and correlate to gross data on weekly household production of recyclates wastes.

The effort required to compact PET and other semi rigid CDS plastics is considerable in the context of landfill. The savings in airspace are considerable as the product is very light and carries a considerable amount of air in the containers. Our estimation of the capacity to compact is about one quarter that of bailing the items in a MRF. Without trials in landfills for these specific items we estimate that landfill compaction will be 250 kgs per m3 depending on the quantum of glass involved. Glass influence here will vary that number from < 200 to > 300 kgs per m3.

The airspace saved therefore correlates with the cost savings on collection where disposal is ¾ of the cost per bag of $2.00 and the collection cost is around ¼.

LANDFILL MANAGEMENT NOTATIONS KPIs (AUD)
Modern landfills require the hole, compaction of internal surfaces, lining systems, leachate collection systems, gas collection systems, closure plans and activities of closure. All these are costs of a landfill that as a total are divisible by the space created to represent capital value. This is amortised by use rather than time as the two won’t correlate.

The low-end scale price per m3 of a large landfill for a city of a million people (400,000 households) will be around $70 per m3 without operating costs. This will need to handle around 300,000 tonnes of waste per annum with a diversion rate of 70% to recycling systems. Equally, this represents 300,000 m3 of airspace. Similarly this would need to handle around 720,000 tonnes of waste per annum with a diversion rate of 40% to recycling systems. Equally, this represents 720,000 m3 of airspace.

Operating costs will be around $30 to $60 per tonne depending on efficiency of the operator.
Most Local Governments and a lot of private organisations do not include the airspace as a calculated number in the books of account.

**QUARTERLY MEASUREMENT OF AIRSPACE VOLUME AVAILABLE IS ABSOLUTELY CRITICAL TO ANY OPERATION OF A LANDFILL.**

- It checks the veracity of tonnes delivered and paid for (defalcations etc)
- Checks the operational KPI of compactive effort – 1,200 kgs per m³ is twice as cost effective as 600 kgs per m³
- Checks the quantity of daily cover added which should remain at around 10% or less.
- Allows for the capacity to constantly improve operations with innovation and efficiencies
- Allows for the longer term planning towards new cells and new landfills
- Measures legislative change influence on diversion from landfill.
- Lengthening the life of a landfill then does not change the capital cost per m³,
- These numbers provide a consistency of financials in management of landfills
- Annualized operating cost are the only numbers that will vary with the changes in waste profile and volumes as legislative mores influence activities; this is more predictable!

The removal of 45,000 tonnes of CDS from landfill will free > 180,000 m³ of airspace annually worth at least $12.6 million in capital cost and $8 million in operating cost. If the diversion rate sits at 40 % presently the airspace saving of CDS will represent a reduction of 25% and a commensurate increase in the life of the landfill of 25%.

Where an operator attempts savings by forcing down operating costs, this does not necessarily correlate to overall cost savings unless the compactive effort is maintained.

The compactive effort is much more critical.

Councils who contract to operators without contractual regard for airspace KPI’s are bound to fail and lose their communities very large sums.
Appendix Six: Ministry for the Environment Funding for Glass and Beverage Recycling Projects 2010 – 2012

APPROVED WMF PROJECTS – 2010

1. Glass reduction study
   Applicant: Westland District Council
   Region: West Coast
   Project type: Investigative
   WMF contribution: $30,000
   Westland District Council is partnering with Scenic Circle Hotel Limited and South Westland Rubbish Removal to identify a more sustainable option for collected glass considering the environmental, social, economic and logistical issues. This feasibility study aims to identify potential end uses for the collected glass and develop a business plan for the preferred solution that can be submitted for future WMF rounds. The project also aims to address the lack of knowledge regarding glass volumes in South Westland.

2. Recycling in public places – making public place recycling happen for the love of New Zealand
   Applicant: Glass Packaging Forum
   Region: NZ nationwide
   Project type: Infrastructure and/or services
   WMF contribution: $1,635,500
   This project was designed to expand the recycling facilities available in the 12 regions that hosted the 2011 Rugby World Cup games. The facilities were to remain in place after the event. The project promoted the LoveNZ brand by working with local councils and industry and through public education around recycling away from the home at concerts and targeted events.

3. Glass Recycling South Westland
   Applicant: South Westland Rubbish Removals
   Region: West Coast
   Project type: Infrastructure and/or services
   WMF contribution: $140,000
   This project was to set up a glass sorting facility at the current recycling depot in order to divert 250 tonnes of glass from the landfill in the first year, 300 tonnes in the second year and around 350 tonnes in subsequent years. Glass is recognised by most people as the number one recyclable material. It was intended that through establishing this facility, the total volume of recycling in South Westland would be significantly increased.

4. Glass sorting plant
   Applicant: Kaikoura Enhancement Trust
   Region: Canterbury
   Project type: Infrastructure
   WMF contribution: $52,000
   This project was to provide a recycling solution for glass in the Kaikoura Community by designing and building a glass sorting facility, so that approximately 425 tonnes of glass could be recycled into glass products.

5. Recycling glass into residential concrete
   Applicant: Allied Concrete Limited
   Region: Invercargill, Wanaka and Wellington
   Project type: Infrastructure and/or services
   WMF contribution: $190,000
   The purpose of the project was to manufacture and retail residential grade concrete using a percentage of waste glass on a commercially viable basis.

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The project involved the purchase and installation of a glass hopper-bin (and associated infrastructure) into each of the existing batching plants, to enable up to 5% substitution of sand with glass. In addition, plant testing, product testing and marketing was required. The product was intended to provide a higher value, local, recycling solution to waste glass.

**RECYCLING IN PUBLIC PLACES - MAKING PUBLIC PLACE RECYCLING HAPPEN FOR THE LOVE OF NEW ZEALAND**

6. **Public Space Recycling**  
   Applicant: Glass Packaging Forum  
   Region: Nationwide  
   Project type: Infrastructure  
   WMF contribution: $200,000  
   
   This project was to build on the success of the existing Love NZ project, by extending the Love NZ Public-Place recycling programme to the commercial sector. The project would provide seed funding to install 190 permanent recycling bins at garage forecourts, shopping malls, retail outlets and other public buildings around the country. The bins would be serviced by the private sector and local authorities that are keen to have the commercial sector take responsibility for waste support the project.

**APPROVED WMF PROJECTS - 2012**

7. **LiteClub - waste minimisation**  
   Applicants: Project Litefoot Trust  
   Location: Nationwide  
   Project type: Education and awareness  
   WMF contribution: up to $197,114 over three years  
   
   The Project Litefoot Trust was to establish a recycling and recovery programme for sports clubs and households around New Zealand. The project was intended to encourage sports clubs to recycle paper, cardboard, plastics and food waste.

**APPROVED WMF PROJECTS SINCE 2012**

WMF grants for glass and beverage container recycling projects since 2012 were not available at time of publishing of this report.

It is worth noting though that the Packaging Forum recently received additional public funds from the Waste Minimisation Fund in July 2015; when the Minister for the Environment, Nick Smith, announced a $700,000 grant for the Forum to trial a drop-off service for plastic bags and film at supermarkets initially in the Auckland area.

Astron Plastics Group also received a $510,000 grant to establish a new dry-cleaning facility in Auckland that will have the capacity to recycle 2000 tonnes of soft plastics and will reduce the requirement to import virgin plastic polymers.

Whilst these grants are not related to beverage container recycling, they are another example of the willingness of the government to use public funds to financially support voluntary industry initiated schemes.
Appendix Seven: Beverage Container Recycling Options for New Zealand - Survey of Local Authorities (Interim Report)

INTRODUCTION
In April/May 2015, Envision surveyed a number of local authorities around New Zealand to gain their views on the cost effectiveness of recycling beverage containers (via kerbside and public space recycling schemes) as well as their opinions on Container Deposit Systems (CDS). The intention was to include the results in this updated version of the 2007 Envision report, The InCENTtive to Recycle.

A questionnaire was sent out to local authorities, leading in some cases to further conversations and discussions with waste managers. At the time of going to print, 16 local authorities had responded, representing 48% of the total population of New Zealand. Funding will be sought to survey the remaining Local Authorities in order to develop a more complete national picture and a final report will be issued. In the meantime a summary of responses at the time of publication follows:

SUMMARY OF SURVEY RESPONSES

1. DOES YOUR COMMUNITY HAVE A KERBSIDE RECYCLING SCHEME?
All 16 Councils that responded (representing a population of 2,113,478 or 48% of New Zealand’s total) have a community kerbside recycling programme.

2. IF YES, HOW IS YOUR KERBSIDE SCHEME FUNDED?
14 out of the 16 kerbside recycling schemes are Council funded through targeted rates. Commercial collectors, on a private user-pays basis, provide the other two.

3. WHAT TYPE OF RECEPTACLE DOES YOUR COMMUNITY USE FOR KERBSIDE COLLECTION?
11 of the 16 Councils that responded use an official 45-70 litre crate for their kerbside collection. Two communities utilise a 60 litre crate for glass combined with an 80 litre or 240 litre wheelie bin for paper, plastics, cardboard and cans. Only one Council that responded allowed communities to use their own crate or container, cardboard box or plastic shopping bag.

4. WHAT DOES IT COST PER HOUSEHOLD TO EMPTY THE KERBSIDE CRATE OR WHEELIE BIN?
Based on the collated responses, the cost per household per week for kerbside recycling collection ranges from $0.33 to $2.80 per week, with an overall average cost of $1.25 per week.

5. WHAT IS THE TOTAL WEIGHT OF MATERIAL COLLECTED ANNUALLY VIA THE KERBSIDE?
The weight of kerbside recyclables collected per household proportional to the number of dwellings in each council area ranged from 60kg (0.06 tonnes) per household per annum to 380kg (0.38 tonnes) per household per annum.

6. WHAT PROPORTION OF THE TOTAL MATERIAL COLLECTED ARE BEVERAGE CONTAINERS?
Based on responses from six Councils, the proportion of the kerbside recycled material estimated to be beverage containers is 47%, with a range of between 30% and 59%.
PUBLIC SPACE RECYCLING BINS

7. DOES YOUR COMMUNITY HAVE PUBLIC SPACE RECYCLING BINS?
Seven of the Councils (44% of respondents) responded that they operate Public Space Recycling Bins.

8. HOW MANY PUBLIC-SPACE RECYCLING BINS DOES YOUR COUNCIL AREA HAVE?
The seven Councils, representing a total population of 1,733,492 (39%) operate a total of 373 Public Space Recycling Bins, ranging from 16 and 194 bins each – or 1 bin per 4647 people.

9. WHAT DOES IT COSTS PER BIN, PER MONTH, TO CLEAR THESE BINS?
   It costs the seven councils (that operate public space recycling bins) an average of $36.12 per month to empty a bin, with a range of between $16.80 and $66.70.

10. WHAT IS THE WEIGHT OF BEVERAGE CONTAINERS COLLECTED ANNUALLY IN EITHER ALL OF THE BINS OR EACH BIN ON AVERAGE?
   The seven respondents gave a range of from 300kg (0.3 tonnes) to 1.75 tonnes of beverage containers collected per bin, per year, an average of 910kg (0.91 tonnes) per year.

11. WHAT IS THE VOLUME OF YOUR PUBLIC SPACE RECYCLING BINS?
   The seven respondents provided a range of volumes from 52L to 4700L – an average of 1542 litres.

12. WHAT LEVELS OF CONTAMINATION DO YOU FIND IN THE PUBLIC SPACE RECYCLING BINS?
   The recorded contamination rates where available, range widely from 2.5% up to 85%, dependent on the time of year and location. The average rate of contamination sits at 37%.

13. HOW MUCH DID THE BINS COST?
   The cost of bins varies dependent on their design and capacity, ranging from $1136 to $2400 for a single bin to $7500 for a multi bin pod.

14. WHO PAID FOR THE BINS?
   The cost of purchasing the bins was funded through a mix of Government funds via LoveNZ, Council waste levies, Council funding, legacy Councils, various trusts and the Glass Packaging Forum.

15. DO YOU FEEL THAT PUBLIC SPACE BINS ARE A COST EFFECTIVE WAY TO ADDRESS THE ISSUE?
   Only two out of the 16 Councils (12.5%) that responded felt that public space bins were a cost effective way to address the issue (of recycling beverage containers in public places), and even then only to a certain degree and only in areas where there are low levels of contamination.

16. OUR RESEARCH SHOWS THAT JURISDICTIONS AROUND THE WORLD WITH REFUNDABLE DEPOSITS ON BEVERAGE CONTAINERS HAVE MUCH HIGHER RECYCLING RATES. DO YOU THINK CDL WOULD WORK IN NEW ZEALAND OR DO YOU HAVE COMMENTS ON CDS?
   88% or 14 of the 16 Councils that responded supported the introduction of CDS in New Zealand. Some of the comments in favour of CDS shared by respondents follow:

   1. Yes I think CDL would work in NZ, it has in the past. Currently these items have no residual value, CDL would change behaviour as well as remove the cost burden from ratepayers.

   2. There is clear evidence that CDL can work with the right amount of infrastructure and logistic support. There has been an
The InCENTive to Recycle

Appendices

1. An incredible amount of investment into the provision of recycling services and facilities across NZ. Much of this financial burden has been met by the ratepayer funding. There is some complacency that as schemes already exist that no further development is required. CDL needs to clearly demonstrate that it is able to increase the overall percentage recovered/recycled and share these costs fairly.

3. CDL would work in NZ. It would not be difficult to set up collection depots.

4. Yes I think it would work but the refund needs to be set high enough to make the return worthwhile. Some people may not be prepared to pay the extra initial outlay required to cover the refund and it would work better if beverage containers became ‘priority products’ under the WMA and the whole process became part of an official Product Stewardship Scheme.

5. This has been in operation in British Columbia Canada for some time and has proved successful. There is no reason it would not work in NZ.

6. It is a no brainer; Central Government needs to legislate this as has been done in Europe. Pay for the container (1 euro in nl for 1.5l plastic bottle) when you buy the beverage and get the money back when returning the bottle to the store. For public places the machines that take plastic bottles and return train tickets (China) or dog food (Turkey) are good examples for areas with high visitor numbers (but likely too costly in most NZ areas unless funded by manufacturers) - connected to mandatory product stewardship for packaging.

7. Council has discussed the unfairness of ratepayers bearing the cost of recycling and believes that CDL more fairly puts more cost on the producer and consumer.

8. Yes I think CDL would work in NZ however would be huge culture shift phasing out kerbside collections and ultimately putting the responsibility on the consumer as opposed to Councils.

Note to comment 8: Kerbside recycling runs effectively alongside CDS in other jurisdictions such as South Australia and British Columbia.
Appendix Eight: The Effect of ‘light-weighting’ of packaging on the recycling sector

Light-weighting of packaging is generally seen as environmentally positive in terms of less resource usage required to package the material and also in terms of products requiring less fuel to be transported to market due to weight reductions. However, the effect of light-weighting upon recycling and recovery sectors is misunderstood and not well documented.

The above picture represents the changes in three products over the period 2005 to 2010. The effects are explained in Table 9 below.

<table>
<thead>
<tr>
<th>Packaging Product</th>
<th>2005 Statistics</th>
<th>2010 Statistics</th>
<th>Effect on Recyclers Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grams per Bottle</td>
<td>Bottles Per Tonne</td>
<td>Revenue Per Bottle ($)</td>
</tr>
<tr>
<td>Glass - Bottles</td>
<td>263.00</td>
<td>3,802</td>
<td>$ 0.019</td>
</tr>
<tr>
<td>PET - Sparkling</td>
<td>28.00</td>
<td>35,714</td>
<td>$ 0.005</td>
</tr>
<tr>
<td>PET - Still</td>
<td>28.00</td>
<td>35,714</td>
<td>$ 0.005</td>
</tr>
</tbody>
</table>

Over five years from 2005 to 2010, glass 330ml bottles reduced in weight from 263 grams to 219 grams (a reduction of 44 grams), which leads to a reduction in revenue of 17% per bottle for the recycler. This requires the recycler to collect and process an extra 764 bottles in 2010 to obtain a tonne of glass 330ml bottles (and theoretically obtain the same revenue in 2010 as in 2005).

For PET sparkling, the weight reduction was 26%, which then requires the recycler to collect and process an extra 12,595 bottles to obtain a tonne of PET bottles in 2010 and for the same revenue, with the weight reduction for PET still being the largest of 36% requiring an extra 19,841 bottles to be collected in 2010.

These statistics have massive financial and logistical implications on the recycling collector and the associated council contracts as well. It also brings into question the relevance of the data we are collecting when we only focus on tonnages for packaging material as our only data evaluation point.
COMPARING SCENARIOS BETWEEN 2005 AND 2010 FOR PET BOTTLES

If the recycling collector collects the same number of bottles in 2010 as in 2005 they will have:

- Collected the same volume but the weight collected will be 36% less
- 36% less revenue from the sale of the product
- This loss in revenue will need to be recovered from efficiencies or potentially from the contract principal
- If the recycling collector collects the same weight of bottles in 2010 as in 2005 they will have:
  - Collected an extra 36% bottles (so for one tonne they would have collected an extra 19,841 bottles). This would require an additional 36% capacity if collected loose
  - Received the same revenue as one tonne collected

So if the collector collects the same amount of bottles in 2010 as in 2005 this has direct financial implications in terms of loss of revenue from the reduced weight. If the collector collects the same weight of bottles in 2010 as in 2005 this will have financial impacts in terms of the additional effort and capacity required to collect the additional 36% of bottles that make up one tonne of product.

WHAT DOES THIS MEAN FOR OUR PACKAGING DATA ANALYSIS?

In terms of packaging data and recycling data (which is collated in terms of weight / tonnes) the historical trend is for both packaging consumption to be increasing and the recovery rates to also be increasing. If this data was changed to bottle counts for the relevant products, this would show that packaging has increased for these products by both the weight collected increase plus the weight reduction as well i.e. if PET - still bottles consumed increased by 10% in terms of weight over the 2005 to 2010 period – the actual increase in terms of packaging by count would be 46% (the weight increase plus the weight reduction over this period). So the weight data hides what is really happening in terms of packaging data relevant to containers that would fit under a CDS.

CDS IS A SOLUTION TO THIS ISSUE

CDS is a solution to this issue for the recyclers and contract principals i.e. councils, as CDS works on a number basis so would have the following effect:

- The recycling collector is paid per unit collected, so light-weighting has no effect on their revenues
- The council contract would not be affected by light-weighting as the same number of units would still be handled and there are no revenue implications for the collection contractor
- The costs to the collection contractor of handling increased numbers of packaging units is automatically covered and paid for under the CDS scheme at no cost to councils (would be potentially positive for the Council contract as it may reduce the required payment to the contractor).

In terms of data, CDS would accurately and better reflect for this market the changes in quantities of packaging being produced, so data could be produced in both weight (which can be misleading) and also quantities.
Appendix Nine: Buy Back Events

To test the likelihood that a 10-cent deposit on bottles would be sufficient to motivate people to bring them back for the refund, Envision has (since the 2007 report), assisted several university student groups to run buy-back events.

The Otago University Student’s Association (OUSA) ran the first event in 2007. They also wanted to encourage students to clean up North Dunedin streets following the widely publicised student riots that had occurred sometime prior to the event.

Over five hours students brought in 7,276 containers for the payout. OUSA have since staged Bottle Buy Back events in October 2011 and April 2015 on their own accord.

Plastic Diet is an Auckland group started by university students that aims to reduce single-use plastic consumption and pollution. They work to promote solutions and awareness to these issues through the media and various events such as an expedition to travel down the Whanganui River in Kayaks made from plastic bottles.

In May 2014, Plastic Diet ran ‘Cash for Containers’ day at Auckland University, where they paid 20c in return for every recyclable drink container students brought in. This event aimed to showcase the importance of extended producer responsibility and to demonstrate how successful container deposit legislation would be if introduced in New Zealand. For more information on Plastic Diet: http://www.plasticdiet.org
Appendix Ten: Refillables vs Single Use Bottles

Although CDSs are capable of handling both refillables and or single use bottles, refillable containers have a number of advantages over single use bottles including fewer CO₂ emissions. This is particularly the case when refillable beverages are produced locally for local or regional markets although the advantage reduces with increased transport distances to refilling stations.

Refillable glass bottles achieve the highest return rates, reaching close to 100% in Germany. They can be refilled up to as many as 50 times76 significantly reducing costs and environmental impacts compared to that of producing single use bottles.

In Germany, water in refillable glass bottles produces only half the amount of carbon dioxide (CO₂) than water in disposable packaging. The reusable bottles will be refilled 50 times or more, and are only transported over short distances (50 km on average). In contrast, one-way packaging is transported over longer distances (250 km on average).

In Europe PET plastic bottles are also refilled up to 20 times. The bottles are made of a harder than usual PET plastic and have small almost imperceptible triangles that are imprinted on them each time they are refilled. Once they have been refilled 20 times they are rejected and recycled as per usual.

According to refillable container manufacturer, Pertainer, a company using one-way bottles can spend four to five times as much on packaging as a company that bottles the same quantity of beverage in 20 trip refillable bottles. The total material used per use of the bottle is 90% lower for the refillable container77.

Environmental education group Inform, says that the refillable glass bottle at 25 trips uses 95.7% fewer containers to deliver 1,000 gallons of beer than an aluminium can78.

Refillable bottles can also promote local economic development in regions. German environmental group DUH states: “The comparison of refillable bottles to the one-way system is not only about the packaging itself, but also about the whole system: Reusable bottles are the livelihood for small, regional and medium sized businesses like breweries, juice and mineral water producers. These companies form the core of the unique diversity of the German drinks market”79.

**SWAPPA CRATE - NEW ZEALAND’S EXISTING CDS**

‘Swappa Crate’, is an existing CDS for refillable beer bottles operated in New Zealand by ABC (The Associated Bottlers Co Ltd.). ABC was formed in 1920 and is currently owned jointly by Lion Nathan and Dominion Breweries. Customers pay a $6.00 (plus GST) deposit when they purchase a ‘Swappa Crate’ containing 12 bottles of beer. Once drunk, they can return the crate and bottles to the store they bought them from and either swap the crate for a new crate of beer, get a discount on another item or at some liquor stores they can receive a refund. The bottles are washed, refilled with beer and put back on the market under the respective Lion Nathan or Dominion Breweries brands.

A similar CDS is operated by Deep Origin80, a small New Zealand company that provides still and sparkling waters to the restaurant trade and homes. For a 10-cent credit, their unique bottles can also be returned for washing and refilling.

Smaller beverage companies such as Foxton Fizz and GreenMan Brewery have until a few years ago operated bottle deposit refund systems and some very small vendors that can be found at local markets still do, but the costs of logistics and management of the system are too great for smaller operators unless part of a national CDS.
In the past bottle collecting, washing and selling back to beverage producers for refilling was a feature of the New Zealand recycling scene with many local businesses operating around New Zealand. Even after soft drink manufacturers stopped selling drinks in refundable bottles in the 1980s, there was still a good business collecting and washing alcoholic spirit bottles, but these too are no longer washed and refilled.

However, there are new environmental drivers now for looking again at the issue of refillables. There is no good reason why it is not possible to re-introduce refillables at some time in the future.

CDS works for both recycling of the material content in a bottle and also refilling the bottle for reuse. The financial incentive of the refundable deposit will drive the returns for both systems equally.
Appendix Eleven: Reverse Vending Machines (RVMs)

The following information was prepared for inclusion in this report by Marcus Fraval of Revolve Recycling, Australia. Envision does not necessarily endorse or otherwise its content.

Reverse Vending Machines (RVMs) are used in many deposit systems around the world for greater consumer convenience, improved efficiency and cost reduction, and accurate data generation and financial control. Specifically RVMs offer:

**CONVENIENCE AND INCREASED CONSUMER PARTICIPATION**

- Allowing a small footprint, automated redemption in convenient locations such as supermarkets or supermarket car parks.
- Offering extended operating hours (typically the same as supermarket opening hours), to enable consumer access out of normal working hours.
- Increased efficiency and reduced costs.
- Replacing manual handling.
- Accepting all major container materials (glass, aluminium, steel, PET, HDPE, other plastics, liquid paperboard etc.).
- Automatically distinguishing deposit containers from non-deposit and foreign objects, and sorting by material and/or colour into pure commodity streams.
- Issuing vouchers for in-store redemption which eliminates the need for cash handling while generating additional traffic for retail partners.
- Capturing data on container brand and type using a combination of barcode scanning, shape recognition and material identification, which then becomes the basis for accurate invoicing.
- Compacting containers for efficient transport and storage and notifying when “bins” are full and need replacing.
- Accepting on-line updates to the RVM container database to instantaneously adjust for the introduction of new containers.
- System integrity and controls.
- Scanning barcodes (which are used in most modern Container Deposit Systems to underwrite system controls and financial integrity) and providing the resulting comprehensive data on all redemptions online to the central coordinator for accurate financial clearing and transparent reporting, as well as cross-checking against producer reported sales data.
- Crushing or flaking containers, not only for efficient logistics, but to “destroy” them to prevent fraudulent multiple redemptions of the same container.
- RVMs provide significant cost savings and improved customer service for retailers, where a retail obligation exists. They also provide substantial savings to the central coordinator and system as a whole (through accurate data provision, pure material streams and reduced transport volumes) as evidenced by the fact that in several markets retailers are paid a higher handling fee by the central coordinator when they choose to install RVMs.
Appendix Twelve: Summary of US Litter Surveys

The following statement was made in section 2.8.5 on litter. “In the USA, the percent of litter reduction in states where studies were conducted fall between 53% and 84%, and total litter has been reduced between 30% and 47%.” The references to the various litter surveys were too long to place as a footnote so have been listed below:


6. Ibid.


The references were sourced from a power point presentation prepared by German Reverse Vending Machine Manufacturer, TOMRA.
Endnotes


2 Container Deposit Legislation: Economic and Environmental Impacts Prepared for the South Australian EPA by Phillip Consulting Pty, Ltd, March 2000 (Referred to as the Hudson report).

3 As not all of the surveys were returned by publication, a final report on the findings will be issued at a later date.

4 Case studies are included in Appendix 1.

5 Diagram – Container Deposit Systems – How they work, copyright, Envision 2015

6 www.bringitback.org.au/condepsys/

7 ABC News online - www.abc.net.au/news/newsitems/200702/s1856098.htm

8 ‘The Deposit Program in BC: Attitudes and Behaviour’. 1998 Angus Reid for McConnell Weaver


11 Source: Keep America Beautiful, kab.org


13 In British Columbia total packaged drinks sales have fallen 12% in BC, partly due to the recession


17 The Incentive to Recycle, Envision, 2006

18 Based on a typical mix of beverage containers and compaction ratios provided by landfill expert Geoff Johnston, One World Environmental Solutions, South Australia

19 Information provided by John Phillips, CEO of Keep South Australia Beautiful

20 2011–12 National Litter Index, Keep Australia Beautiful (KAB)

21 Table courtesy of Zero Waste South Australia

22 See Appendix 12 for a list of the referenced studies conducted in the USA

23 Reuse and Recycling Systems for Selected Beverage Packaging from a Sustainability Perspective, Price Waterhouse Coopers, 2011

24 Source: www.recycling.kiwi.nz

25 www.cleanup.org.nz

26 COAG SKEW 2011

27 Source of South Australian EPA data, Andrea Woods, Team Leader, Container Deposits South Australian EPA

28 Equilibrium 2013


31 Extract from Western Australian Hansard [ASSEMBLY - Thursday, 4 May 2006] p2193b 2194a, Mr John Hyde; Mr Mark McGowan

32 Extract from Western Australian Hansard [ASSEMBLY - Thursday, 4 May 2006] p2193b
2194a, Mr John Hyde; Mr Mark McGowan

The container recycling fee represents the net cost of the system which in the model proposed in this report is 0.5 cents per container

In this model about 3 cents per container

The demand by beverage producers in South Australia that all returned bottles are manually counted to ensure brands don’t pay more than they are required to adds considerable expense to the system. In some jurisdictions beverage producers simply pay a share of funds based on their proportion of market share – a much simpler and cheaper approach.

See 11 for further information on RVMs

Provided by the South Australian EPA

This compares with US consumption of 800 beverage containers per annum in the BEAR report

Stakeholder Advisory Group Investigation into Best Practice Container Deposit Systems for Western Australia. January 2002

South Australia’s CDS had risen to just over 79% in 2014/15

Stakeholder Advisory Group Investigation into Best Practice Container Deposit Systems for Western Australia, January 2002

11.7 cents is made up of the 10-cent refund (less GST), plus 3 cents handling fee (exc GST)

Based on commercial in confidence information provided by large South Australian recycling contractor

As explained in Section 5, there will be a strong reliance on utilising existing facilities (council, recyclers, social service groups, local businesses etc.) for Collection Points. Development of these and new facilities could potentially utilise funds generated by the landfill levy.


Container Deposit Legislation: Economic and Environmental Impacts Prepared for the South Australian EPA by Phillip Consulting Pty, Ltd, March 2000

Provided by industry expert Gary Kelk and corroborated by recycling consultant Geoff Johnston (see appendix 5.)

Source: Green Living Improvements, http://greenlivingimprovements.com

Source: Glass Packaging Forum Website, www.glassforum.org.nz
56 Source: Ministry for the Environment website (2015)
57 Source: Ministry for the Environment website (2015)
news/article.cfm?c_id=3&objectid=10817728
59 The packaging industry received additional public funds from the Waste Minimisation Fund in
July 2015; when the Minister for the Environment Nick Smith announced a $700,000
grant to the Packaging Forum to trial a drop-off service for plastic bags and film at
supermarkets initially in the Auckland area
60 Household sector waste to landfill in New Zealand, Waste Not Consulting, 2009
61 Phone conversation with PACNZ CEO Sharon Humphries, 2nd September 2015
62 PACNZ have moved now to measuring the total quantity of packaging recovered per person
per annum and have contracted economic analysts Infometrics Ltd. to carry out this
research.
63 Source: Container Recycling Institute, report, Bottled Up, US Container Recycling Rates and
Trends, 2013
64 This graph is no longer available on the Glass Packaging Forum’s website
65 Diageo Australia Ltd submission to the Western Australian Government enquiry into CDS,
August 2001
instruments-in-the-management-of-waste-3
bev/index.html and www.grm.org
70 Recycling Regulation, B.C. Reg. 449/2004, ss. 8(2).
71 For an overview of Industry Product Stewardship in BC see: www.elp.gov.bc.ca/epd/epdpa
ips/index.html
72 www.brewers.ca
73 Encorp’s annual reports are available at: http://www.encorp.ca
74 Sources of Information for the Norway case study: AnkerAndersen, http://anker-andersen
dk/deposit-laws/norway.aspx,, Deposit Systems for One-way Beverage Containers Global
Overview, Tomra, 2015 and Infinitum, http://infinitum.no
75 Plastic Ocean, Published by Avery (a member of the Penguin Group) 2012
76 Reuse and Recycling Systems for Selected Beverage Packaging from a Sustainability
Perspective Report by Price Waterhouse Coopers, 2011
77 http://www.petainer.com/Products/Refillables
reassessing-refillable-bottles-executive-summary.html
80 http://chandler-resources.com/index.html